CAREER PATH
A GUIDE FOR INSTANT PLACEMENT

VOLUME - 1

COMPILED BY TRAINING CUM PLACEMENT CELL
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1. COMMUNICATION
Directions (Q 1-9): The questions that follow the passage are based on the text of the passage. Point out the correct answers.

Passage 1
The first step is for us to realise that a city need not be a frustrater of life; it can be among other things, a mechanism for enhancing life, for producing possibilities of living which are not to be realized except through cities. But, for that to happen, deliberate and drastic planning is needed. Towns as much as animals, must have their systems of organs-those for transport and circulation are an obvious example. What we need now are organ systems for recreation, leisure, culture, community expression. This means abundance of open space, easy access to unspoilt Nature, beauty in parks and in fine buildings, gymnasias and swimming baths and recreation grounds in plently, central spaces for celebrations and demonstrations, halls for citizens' meetings, concert halls and theatres and cinemas that belong to the city. And the buildings must not be built anyhow or dumped down anywhere; both they and their groupings should mean something important to the people of the place.

1. Cities can be made to provide full facilities for life, only if:
   a. these can be mechanically developed.
   b. proper transport system is introduced.
   c. cinemas, theatres and concert halls are established there.
   d. these are thoughtfully and vigorously designed to serve people's needs.
   Ans (d)

2. A suitable title for the passage would be:
   a. Towns versus Animals.
   b. The Need for Planned Cities.
   c. Transport and Communication System in a City.
   d. The Need for Entertainment Centres in a City.
   Ans (b)

3. "A city need not be a frustrater of life" means that:
   a. (a)one does not expect fulfillment of all life's requirements from a city.
   b. city life provides all the essential needs of life.
   c. a city does not necessarily lift man's standard of living.
   d. a city should not defeat the fulfillment of life's aspirations and aims.
   Ans (b)

4. Which one of the following has the opposite meaning to the word 'frustrater' in the passage?
   a. Promoter
b. Applauder
c. Approver
d. Executer
Ans (a)

5. "The building must not be built anyhow or dumped down anywhere"...the statement implies that building:
   a. should be built with suitable material.
   b. should be constructed, according to some suitable design, not indiscriminately.
   c. should be scattered to provide for more of open space.
   d. should be built to enable citizens to enjoy nature.
Ans (c)

6. The word 'drastic' in the passage means:
   a. orderly.
   b. powerful,
   c. consistent.
   d. determined.
Ans (b)

7. The author talks about 'Unspoilt Nature'. In what way can Nature remain unspoilt?
   a. If Nature is not allowed to interfere with people's day-to-day life.
   b. By building cities with the system of organs like those of animals.
   c. By allowing free access to parks and open spaces.
   d. By allowing Nature to retain its primitive, undomesticated Character.
Ans (b)

8. According to the author, the function of a city is to:
   a. provide adequate community expression.
   b. make available centers of recreation and public gatherings.
   c. facilitate traffic and communication.
   d. raise the tone of life and make it more meaningful.
Ans (d)

9. The opening sentence of the passage implies that:
a. the possibilities of living a decent life cannot be found in a city.
b. only a city can provide the means to lead a full life.
c. among other places, a city can also help man to lead a successful life.
d. a city provides better opportunities for good living than a village.

Ans (b)

Directions (Q 1-5): The following sentences contain errors in grammar, usage, diction (choice of words) or idioms and spellings. No sentence, however, contains more than one error. Each sentence has been broken up into four parts sequentially (1, 2, 3, 4). Choose the part that has the mistake and mark your answer.

1. We have no objection (1)/ to him participating in the debate (2)/ provided he cares (3)/ to observe the rules formulated by the expert committee (4).
2. There is the idea of competition, natural selection and the survival (1)/ of the fittest which purpose to explain (2)/ the natural and automatic process (3)/ of evolution and development (4).
3. In spite of their pressing into service several fire-fighters (1)/ they found it difficult (2)/ to put off (3)/ the fire which was spreading fast to the neighbouring buildings (4).
4. Rabindranath Tagore, the great Indian poet, born (1)/ at a time (2)/ when there was a confluence (3)/ of three revolutionary movement (4).
5. The assistant engineer was advised to give (1)/ the building contract to whomever (2)/ he believed (3)/ had a strong sense of responsibility (4).

Directions (Q 6 – 8): Out of the given choices marked 1-4, select the best substitute for the leading sentence. Mark the correct choice as the answer.

6. One who is determined to take exact full vengeance for wrongs done to him:
   a. vindictive
   b. vengeful
   c. Inductor
   d. Candice

7. Custom of having many wives:
   a. Homogamy
   b. Polygamy
   c. Matroagamy
   d. Monogamy
8. **person who has no money to pay off his debts:**
   a. Insolvent
   b. Beggar
   c. Debtor
   d. Creditor

**Directions (Q 9-10):** _Give the correct antonyms of the following words out of the given choices below the leading word._

9. **AUTONOMY:**
   a. Independent
   b. Independence
   c. Dependence
   d. Proud

10. **ONEROUS:**
    a. Tough
    b. Difficult
    c. Easy
    d. Complicated

**Directions (Q 11-15):** _Find out the correct choice no. as the answer after changing the given sentences from Active voice to passive voice and vice versa._

11. **A song will be sung by him.**
    a. He will be sing a song
    b. He would sing a song
    c. He will sing a song
    d. He shall sing a song

12. **They had already tried this plan.**
    a. This plan had already tried by them.
    b. This plan had already being tried by him.
    c. This plan had been already tried by them
d. This plan had already been tried by them

13. Can you please her?
   a. Can she pleased by you?
   b. Could she pleased by you?
   c. Can she pleased by you?
   d. Can she be pleased by you?

14. The child is not cutting teeth.
   a. Teeth are not being cutting by the child
   b. Teeth are not being cut by child
   c. Teeth are not cut by the child
   d. Teeth are not cutting by child

15. She was not paying the taxes.
   a. The taxes not paid by her
   b. The taxes are not being paid by her
   c. The taxes were not being paid by her
   d. The taxes is not being paid by her

Directions (Q 16-20): The questions that follow the passages are based on the text of the passages. Point out the correct answers.

Liberty is not a personal affair only, but a social contract. It is an accommodation of interests. In matters which do not touch anybody else liberty of course, I may be as free as I like. If I choose to go down the Strand in a dressing-gown, with long hair and bare feet, who shall say me nay? You have liberty to laugh at me, but I have liberty to be indifferent to you. And if I have a fancy for dyeing my hair, or waxing my moustache (which heaven forbid), or wearing a tall hat, a frock coat and sandals, or going to bed late or getting up early, I shall follow my fancy and ask no man permission. I shall not inquire of you whether I may eat mustard with my mutton. I may like mustard with my mutton. And you will not ask me whether you may follow this religion or that, whether you may marry the dark lady or the fair lady, whether you may prefer long fellow to Wordsworth, or champagne to coca cola.
16. "Not a personal affair” means ______
   a. not enjoyed in person.
   b. not having individual affairs.
   c. not concerned with individuals.
   d. None of these

17. “Accommodation of interests” means
   a. a place for living of interests
   b. adjustment of individual interests
   c. adjustment of personal ends
   d. None of these

18. “Indifferent to” can be replaced by ______
   a. having no interest in.
   b. unconcerned about.
   c. not worried about.
   d. None of these

19. The word “fancy” has been used twice in the passage. It means:
   a. liking; liking
   b. Imagination; Imaginative
   c. liking; whim
   d. None of these

20. "Inquire of you” means ______
   a. Inquire from you
   b. Inquire about you
   c. Inquire into your views
   d. None of these

Directions (Q 21-25): Fill in the blanks with suitable propositions/words given below.
21. She was debarred ______ appearing in the exam.
   a. for  
   b. of  
   c. from  
   d. None of these

22. His views did not coincide ______ those of his wife.
   a. to  
   b. on  
   c. for  
   d. with

23. If you had come earlier, we ______ to see the movie.
   a. would go  
   b. would be going  
   c. will have gone  
   d. would have gone

24. He lives _____ Andheri _____ Bombay.
   a. in, in  
   b. at, at  
   c. in, at  
   d. at, in

25. I am astonished ______ her way of talking.
   a. at  
   b. with  
   c. on  
   d. upon

Directions (Q 26-28): In each of the following questions an idiomatic expression, followed by the possible meanings numbers 1 to 5 is given. From the given choices, find the choice number which gives the correct meaning of the idiomatic expression and mark the choice number as your answer.
26. To smell a rat
   a. to see sings of plague epidemic
   b. to get bad smell of a dead rat
   c. to suspect foul dealing
   d. to be in a bad mood

27. To have an axe to grind
   a. a private end to serve
   b. to fail to arouse interest
   c. to have no result
   d. to work for both sides

28. To eke out
   a. To earn a living
   b. To rush out
   c. To finish oil
   d. To go out of the way

Directions (Q 29-30): In the following sentences idioms/proverbs have been used, followed by their meaning in choice number 1 to 5. Mark the correct choice number as answer.

29. I raked my brains to solve this difficult problem.
   a. I read number of books
   b. I consulted several people
   c. I used my common-sense
   d. I subjected my mind to hard thinking

30. He was a king who ruled his subjects with a high hand.
   a. sympathetically
   b. kindly
   c. democratically
   d. oppressively
Directions (Q 31-33): Mark the correct choice number which is the meaning (synonym) of the leading word.

31. Garnish:
   a. to adorn
   b. to worship
   c. to garland
   d. to excuse

32. Abhor:
   a. repentance
   b. love
   c. hate
   d. persistent

33. Panacea:
   a. A universal agreement
   b. A universal truth
   c. A universal phenomenon
   d. A universal medicine

Directions (Q 34-35): In each of the sentences given below a word has been underlined and four choices marked 1 to 4 have been given. Choose the correct word which is opposite word underlined in the sentence. Mark the choice number as your answer.

34. His unscrupulous pursuit of wealth finally landed him in prison.
   a. Conscientious
   b. Dedicated
   c. Single-minded
   d. Superfluous

35. Let us not aggravate the sufferings of the poor.
   a. Advocate
b. Appreciate  
c. Alleviate  
d. Abbreviate

Directions (Q 36-40): In the following passage there are blanks, each of which has been numbered. These numbers are printed below the passage and against each, five words are suggested, one which fits the blank appropriately. Find out the appropriate word and mark the choice number as your answer.

Smoking is the biggest preventable ______ (186) ______ to mankind. Many serious ______ (187) ______ including lung cancer, bronchitis and heart attack are ______ (188) ______ to smoking habits. Smoking in any form whether cigarette, cigar, pipe, bidi or tobacco chewing has been ______ (189) ______ as a major ______ (190) ______ factor for heart attack.

36.
   a. measure  
   b. tragedy  
   c. menace  
   d. solace

37.
   a. debacles  
   b. diseases  
   c. practices  
   d. injuries

38.
   a. caused  
   b. directed  
   c. averse  
   d. traced

39.
a. developed  
b. explained  
c. attributed  
d. identified

40.

a. important  
b. critical  
c. risk  
d. ailing

Directions (Q 41-42): Each of the following words is spelt in four different ways. One of them is correctly spelt. Pick out the correctly spelt word

41.

a. Leutinant  
b. Lieutenant  
c. Lieutinent  
d. Lieutanant

42.

a. Charactar  
b. Chacter  
c. Character  
d. Characatar

Directions (Q 43-45): Mark the correct choice after changing the Narration of the leading sentence.

43. The mother said to the teacher, “Do not punish my son.”

a. The mother told the teacher not to punished her son.  
b. The mother requested the teacher that her son might not be punished.  
c. The mother requested the teacher that not to punish her son.
d. The mother requested the teacher not to punish her son.

44. The Judge asked the prisoner if he has anything to say.
   a. The Judge said to the prisoner, “Have you anything to say?”
   b. The Judge said to the prisoner, “If you have anything to say?”
   c. The Judge said to the prisoner, “You had anything to say?”
   d. The Judge said to the prisoner, “Have you anything to be said?”

45. She advised me not to trust him.
   a. She said to me, “Not to trust you.”
   b. She said to me, “Not to Trust him.”
   c. She said to me, “Do not be trust by him.”
   d. She said to me, “Do not trust him.”

Directions (Q 46-50): The questions that follow the passages are based on the text of the passage. Point out the correct answers.

The third thing we must do is not to be content with mere political democracy. We must make our political democracy a social democracy as well. Political democracy cannot last unless there lies at the base of it social democracy. What does social democracy mean? it means a way of life which recognizes liberty, equality and fraternity as the principles of life. These principles of liberty, equality and fraternity are not to be treated as separate items in Trinity. They form a union of Trinity in the sense that to divorce one from the other is to defeat the very purpose of democracy. Liberty cannot be divorced from equality, equality be divorced from liberty. Nor can liberty and equality be divorced from fraternity. Without equality, liberty would produce the supremacy of the few over the many. Equality, without liberty, would kill individual initiative. Without fraternity, liberty and equality would not become a natural course of things. It would require a constable to enforce them.

46. The “third thing” which the author wants us to do is ______
   a. Not to be complacent with political democracy
   b. Not to be happy with political democracy
   c. Not to be dissatisfied with political democracy
47. Political democracy will end if ______
   a. There is no social democracy
   b. There is social democracy
   c. There is political democracy
   d. None of these

48. Social democracy means ______
   a. Liberty, equality and fraternity
   b. A way of life
   c. Political democracy
   d. None of these

49. The principles of liberty, equality and fraternity can be treated as ______
   a. Separate
   b. Unified
   c. One
   d. None of these

50. Liberty without equality would result in ______
   a. Dictatorship
   b. Supremacy of some
   c. Tyranny of many
   d. None of these

Idioms and Phrases for Competitive Exams – English Sample Paper

1. In the last few years India has advanced by leaps and bounds in the industrial sector.
   a. Very rapidly
   b. Very competently
   c. Very slowly
d. Very pathetically  
e. None of these

2. The authorities turned a deaf ear to the demands of the employees.  
   a. Immediately implemented  
   b. Agreed to listen to  
   c. Misrepresented  
   d. Whole-heartedly agreed to  
   e. None of these

3. He was in doldrums after the quarrel he had with his brother.  
   a. He was jubilant  
   b. He was in low spirits  
   c. He was in a financial difficulty  
   d. He left the house  
   e. None of these

4. If you pass this difficult examination it will be a feather in your cap  
   a. Your parents will be very happy  
   b. You will get a scholarship for higher studies  
   c. You will feel proud of it  
   d. You will get a very good job  
   e. None of these

5. Tell me plainly who broke the mirror, do not beat about the bush.  
   a. Pretend to be unaware of the matter  
   b. Try to impress me with your arguments  
   c. Put any blame on others  
   d. Approach the matter in a round about way  
   e. None of these

6. Some people have a habit of wearing their heart on their sleeve.  
   a. saying something which is not to be taken seriously  
   b. exposing their innermost feelings to others
c. avoiding being friendly with others
d. always trying to gain advantage over others
e. wasting their time on unnecessary details

7. I raked my brains to solve this difficult problem.
   a. I read number of books
   b. I consulted several people
   c. I used my commonsense
   d. I subjected my mind to hard thinking
   e. I brainwashed several experts

8. He was a king who ruled his subjects with a high hand.
   a. sympathetically
   b. kindly
   c. democratically
   d. conveniently
   e. oppressively

9. It is a matter of gratification for me that he has turned a new leaf.
   a. begun a different mode of life
   b. proved to be a worthy person on his job
   c. decided to use a different strategy to solve the problem
   d. accepted the new job that was offered to him
   e. started using his intelligence

10. He is a plain, simple and sincere man, he will always call a spade a spade.
    a. be outspoken
    b. help needy person
    c. stand by his friends and relatives
    d. sacrifice his life for others
    e. put up a simple dress

11. It was such a strange affair that I could not make head or tail of it.
    a. tolerate it
    b. face it
c. remember it
d. believe it
e. understand it

12. He is temporarily in charge of the company and is trying to feather his nest.
   a. bring order and discipline in the company
   b. raise the image of the company
   c. act for his own future benefits
   d. diversify the product of the company
   e. practice his own brand of management philosophy

13. Those who make no bones about such actions face a tough opposition.
   a. do without hesitation
   b. make no plan
   c. waste no time
   d. invite no comments
   e. None of these

14. Mrs B is known as a shoplifter in a Mumbai commercial center.
   a. smuggler
   b. a thief in the guise of a customer
   c. buyer of all new things
   d. daily visitor
   e. None of these

15. The people in north India are known for keeping open house.
   a. never locking it
   b. not worrying about its security
   c. offering hospitality to everyone
   d. keeping it well ventilated
   e. None of these

Directions (Q 16-20): In each of the following questions an idiomatic expression and its four possible meaning are given. Find out the correct meaning of the idiomatic expression and mark the number of that meanings as your answer on the answer sheet. If you do not find any correct answer, mark ‘5’, i.e. none of these as your answer.
16. To make clean breast of
   a. to gain prominence
   b. to praise oneself
   c. to confess without reserve
   d. to destroy before it blooms
   e. None of these

17. To end in smoke
   a. to make completely understand
   b. to ruin oneself
   c. to excite great applause
   d. to overcome some one
   e. None of these

18. To leave someone in the lurch.
   a. to come to compromise with someone
   b. constant source of annoyance to someone
   c. to put someone at ease
   d. to desert someone in his difficulties
   e. None of these

19. To cry wolf
   a. to listen eagerly
   b. to give false alarm
   c. to turn pale
   d. to keep off starvation
   e. None of these

20. A man of straw
   a. a man of no substance
   b. a very active person
   c. a worthy fellow
   d. an unreasonable person
   e. None of these
Welcome! Here in this section you can check out your English skills to appear for any competition test. Here we provide you 10 English competition questions with their answers which seem to have maximum probability in reasoning exam.

So go through these 10 questions and increase your chance to clear the exam.

1. Why did the people from the country, including the farmer and the soldier gather around the spot where the stone lay?
   a. They were hoping to discover a gold mine.
   b. They were told that the king was waiting for them at the very spot.
   c. They were hoping to discover some more gold for themselves.
   d. They wanted to make sure that the stone was really removed.

2. Which of the following adjectives given below would best describe the king?
   a. Evil
   b. Industrious
   c. Lazy
   d. Careless

3. Why did the king hide behind the bush?
   a. He wanted to see how his people would react to the stone.
   b. He was spying on the young soldier.
   c. He was not getting sleep.
   d. He wanted to guard the palace.
4. Out of the four choices given, choose the one that is the nearest in meaning to the idiom/phrase printed in bold. The poor boy found it difficult to make up his deficiency in English.
   a. Recover
   b. correct
   c. remove
   d. improve

5. Choose the correctly spelt word in each of the sets given below:
   a. Consummation
   b. Consummetion
   c. Consumption
   d. Consumetion

6. Why did the miller's daughter decide to move the stone?
   a. She wanted the gold that lay beneath the stone.
   b. She was afraid that someone would get hurt.
   c. She knew that the king was watching her from behind the bush.
   d. The girl loved challenges and wanted to show her strength to the king.

7. My parents came.....
   a. To town with
   b. the intention in visiting
   c. the University.
   d. No error

8. I must start ___ dawn to reach the station on time.
   a. during
   b. doing
   c. in
   d. before

9. As it was getting late, I was ___ troubled focusing on the birds in the disappearing light.
   a. feeling
   b. having
   c. experience
10. Which of the following statements is true of the king according to the passage?
   a. He often did useless thing like placing stone on the road to irritate his people.
   b. He tried his best to teach his people to be industrious.
   c. He was responsible for placing the box of gold beneath the stone.
   d. Only (A)
   e. Only (C)
   f. (C) Only (B) and (C)
   g. (D) Only (B)

You can check the answers below of all above mentioned questions -
   a. Ans– 1(C), 2(B), 3(A)
   b. 4(D), 5(A), 6(B)
   c. 7(C), 8(D), 9(B)
   d. 10(C)

Choose the correct verb form.
1. I am trying to become more skilled at weaving before winter _______
   a. arrived.
   b. will have arrived.
   c. will arrive.
   d. arrives.

2. While trying to _______ his cat from a tree, he fell and hurt himself.
   a. be rescuing
   b. have rescued
   c. rescue
   b. rescuing

3. The volunteers from the fire department _______ quickly and extinguished a fire on North Country
   a. Road.
   b. ill respond
   c. responded
   d. will have responded
   e. d. have responded
4. In Tuesday’s paper, the owner of the supermarket was recognized for helping a customer who _______ on the icy sidewalk.
   a. a. falls
   b. b. would fall
   c. c. had fallen
   d. d. has fallen

5. The people who bought this old lamp at the antique auction _______ very smart.
   a. Was
   b. Were
   c. Is
   d. has been

6. I _______ her speak on Friday night about the advantages of organic gardening.
   a. will have heard
   b. would hear
   c. would have heard
   d. will hear

Choose the correct pronoun form.

7. That snappy looking sports car belongs to my sister and _______.
   a. I
   b. me
   c. Mine
   d. myself

8. The person _______ made this delicious cheesecake has my vote.
   a. that
   b. which
   c. who
   d. whose

9. George and Michael left _______ backpacks in the car.
   a. his
   b. their
   c. there
   d. its

10. We arranged the flowers and placed _______ in the center of the table.
11. _______ met more than ten years ago at a mutual friend’s birthday party.
   a. Her and I
   b. Her and me
   c. She and me
   d. She and I

Find the sentence that has a mistake in grammar or usage. If there are no mistakes, select choice d.

12. Have you ever read the book called The Firm?
   a. She urged me not to go.
   b. Stop, look, and listen.
   c. no mistakes

13. Three’s a crowd.
   a. If you’re not sure, look in the dictionary.
   b. They weren’t the only ones that didn’t like the movie.
   c. no mistakes

14. Anne will leave first and Nick will follow her.
   a. Maya Angelou, a famous poet, recently spoke at our school.
   b. The clerk asked for my address and phone number.
   c. no mistakes

15. That parrot doesn’t talk.
   a. Don’t spend too much money.
   b. We waited until he stopped to make a phone call.
   c. no mistakes

16. Alberto laughed loudly when he saw us.
   a. They’re looking for another apartment.
   b. The first house on the street is there’s.
   c. no mistakes

17. I love the fireworks on the Fourth of July.
   a. The dog’s barking woke us from a sound sleep.
b. My grandparents live in Dallas, Texas.
  c. no mistakes

18. **Ursula has broke one of your plates.**
   a. The sun rose from behind the mountains.
   b. Don’t spend too much time on that project.
   c. no mistakes

19. **She believed in keeping a positive attitude.**
   a. After we sat down to eat dinner, the phone rung.
   b. Sign all three copies of the form.
   c. no mistakes

20. **The Adirondack Mountains are in New York State.**
    a. President Carter returned control of the Panama Canal to Panama.
    b. She missed the bus and arrives late.
    c. no mistakes

21. **The childrens books are over there.**
    a. There is not enough paper in the printer for the entire document.
    b. What’s the weather forecast for today?
    c. no mistakes

Choose the sentence or phrase that has a mistake in capitalization or punctuation. If you find no mistakes, select choice d.

22. **My favorite season is Spring.**
    a. Last Monday, Aunt Ruth took me shopping.
    b. We elected Ben as treasurer of the freshman class.
    c. no mistakes

23. **He shouted from the window, but we couldn’t hear him.**
    a. NASA was launching its first space shuttle of the year.
    b. The boys’ wore identical sweaters.
    c. no mistakes

24. **Occasionally someone will stop and ask for directions.**
    a. When you come to the end of Newton Road, turn left onto Wilson Street.
    b. Lauren’s father is an auto mechanic.
    c. no mistakes

25. **That book must be yours.**
26. **The US flag should be flown proudly.**
   a. She served eggs, toast, and orange juice for breakfast.
   b. He wanted turkey, lettuce, and mayonnaise on his sandwich.
   c. no mistakes

27. **Dear Anne,**
   a. Sincerely, yours
   b. Yours truly,
   c. no mistakes

**ANSWERS ::**

1. This sentence is in the present tense.
2. The infinitive form of the verb is used in this sentence.
3. This sentence is in the past tense.
4. This sentence needs a verb that is in the past tense.
5. Were is in agreement with the plural subject people.
6. This sentence is in the future tense.
7. The correct form of the pronoun is me (objective case).
8. The correct pronoun is who because it refers to a person.
9. The pronoun their agrees with the plural subject, George and Michael.
10. The pronoun them agrees with the plural noun flowers.
11. She and I is the subject of the sentence, so the subjective case is needed.
12. There are no errors.
13. The word that should be who because it refers to people.
14. There should be a comma before the conjunction and in this sentence to separate two complete thoughts.
15. The contraction doesn’t has an apostrophe.
16. The correct possessive pronoun is theirs, not there’s.
17. There are no errors.
18. The correct verb form is has broken.
19. The correct verb form is rang.
20. Both verbs, missed and arrives should be in the past tense.
21. An apostrophe should be added before the s in children’s to make it possessive.
22. Spring is not a proper noun, so it should not be capitalized.
23. The word boys’ should not show possession; no apostrophe is needed.
24. A comma is needed to set off the introductory word, occasionally.
25. An apostrophe is needed before the last s in the word elses to show possession.
26. There should be periods after the abbreviation U.S.
27. The comma should be placed after the word yours.
Comprehension Passage 1

Passage 1

A Close look at the facts relating to political interference in administration shows that it is not a one-way process. There is often a nexus between power hungry and corrupt politicians and civil servants with convenient principles. Many civil servants are only too anxious to oblige the politicians, and then cash the obligation when they need some special favour. So the attitude of self-righteousness adopted by the civil service is sometimes only a way of covering their own flaws by blaming others. Every now and then some retired civil servants come out with his memoirs, painting a glorious picture of the heights of administrative efficiency reached during his reign. There is often the suggestion that had there not been so much political interference, things would have been even more fantastic. It is not unusual for the self styled hero to blame not only interfering politicians but also fellow civil servants who are idiots or crooks, for his failures. This attitude of smug self-satisfaction is, unfortunately, developed during the years of service. Self preservation rather than service is encouraged by our whole system of rules and procedures. The remedy has to be drastic and quickly effective. The over protection now granted to civil servants must end. Today to remove an erring civil servant is just not possible. And the only thing that the highest authority in the Government, both in the State and at the Centre, can do is to transfer an official from one job to another. The rules for taking disciplinary action are so complicated that, in the end, the defaulting civil servants gets away, and gets his full emoluments even for the period of the disciplinary proceedings, thus making it a paid holiday for him. The result is that the administration has become rule-oriented and not result-oriented. Action is possible against the official who takes some interest in his work, but no action is ever taken against a person who does not deliver the goods. If the country is to adopt a result-oriented approach, it is necessary to link job performance with job retention.

1. The facts relating to the problem of political interference indicate that:
   (a) honest bureaucrats are always being troubled by politicians.
   (b) politicians are often misled and trapped by civil servants.
   (c) politicians and civil servants co-operate to gain mutual advantages.
   (d) politicians and civil servants use interference as an excuse for victimising the common man.

   Ans (c)

2. The attitude of self-righteousness adopted by the civil service, according to the writer:
   a. is not welcomed and supported by politicians.
   b. is dishonest and conceals the facts.
   c. is very difficult to maintain because of opposition.
   d. does not really help the public get fair treatment.

   Ans (b)
3. **Civil servants who write their memoirs after retiring:**
   a. claim that they would have achieved outstanding success if interference had not come in the way.
   b. prove that constant political interference made it impossible for them to do anything properly.
   c. complain that the credit for their achievements goes to dishonest politicians.
   d. prove that people of inferior quality in the civil service bring about interference.
   Ans (a)

4. **The existing system of administration seems to encourage civil servants:**
   a. to become self-styled heroes and boss over others.
   b. to present a glorious picture of the administration.
   c. to become self-centred and concerned mainly about their own gain.
   d. to become self-righteous and fight back against corrupt politicians.
   Ans (c)

5. **The problem with the present set-up needing urgent action is:**
   a. a lack of accountability on the part of civil servants.
   b. a lack of control over the power of politicians.
   c. a neglect of the ideals of self-righteousness.
   d. complicated rules and procedures that greatly reduce efficiency.
   Ans (a)

6. **The main principle of the remedy proposed by the writer is, that:**
   a. the politicians should be made accountable for all their decisions.
   b. the high level of protection enjoyed by civil servants should be reduced.
   c. the common man’s right to efficient and fair administration must be protected.
   d. rules should be simplified so that there is less scope for misuse.
   Ans (b)

7. **According to existing procedures, if a civil servant is found to be unsuitable or dishonest:**
   a. he can appeal to an authority like the Supreme Court.
   b. politicians with whom he has special links will interfere to help him.
   c. transferring him to another post is the usual action taken.
   d. a conflict between Central Government and State Government interests can arise.
   Ans (c)
8. **The writer refers to a paid holiday to support his argument that:**
   a. civil servants get a lot of extra benefits.
   b. disciplinary action is generally not quick or effective.
   c. lazy and inefficient bureaucrats seem to be on holiday even when on duty.
   d. special postings that favoured civil servants are necessary and wasteful.
   Ans (b)

9. **The expression linking job performance with job retention refers to a policy in which:**
   a. selection to civil service jobs is on the basis of rigorous performance tests.
   b. selection to civil service jobs is on the basis of rigorous performance and not a minister’s opinion is the basis of transfer or promotion.
   c. retention of good government servants by discouraging their going to private companies.
   d. continuation in service will depend on satisfactory performance.
   Ans (d)

10. **The expression deliver the goods means:**
    a. show good job performance
    b. accept bribes or other illegal favours.
    c. make payments of black money as bribes.
    d. successfully defend oneself against a charge, in a disciplinary inquiry.
    **Ans (a)**

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**Passage 2**

It is a strange that, according to his position in life, an extravagant man is admired or despised. A successful businessman does nothing to increase his popularity by being careful with his money. He is expected to display his success, to have smart car, an expensive life, and to be lavish with his hospitality. If he is not so, he is considered mean and his reputation in business may even suffer in consequence. The paradox remains that if he had not been careful with his money in the first place, he would never have achieved his present wealth.
Among the two income groups, a different set of values exists. The young clerk who makes his wife a present of a new dress when he hadn’t paid his house rent, is condemned as extravagant. Carefullness with money to the point of meanness is applauded as a virtue. Nothing in his life is considered more worthy than paying his bills. The ideal wife for such a man separates her housekeeping money into joyless little piles—so much for rent, for food, for the children’s shoes; she is able to face the milkman with equanimity and never knows the guilt of buying something she can’t really afford. As for myself, I fall into neither of these categories. If I have money to spare, I can be extravagant, but when, as is usually the case, I am hard up, then I am the meanest man imaginable.

1. **In the opinion of the writer, a successful businessman:**
   a. is more popular if he appears to be doing nothing.
   b. should not bother about his popularity.
   c. must be extravagant before achieving success.
   d. is expected to have expensive tastes.

   Ans (d)

2. **The phrase lavish with his hospitality signifies:**
   a. miserliness in dealing with his friends.
   b. considerateness in spending on guests and strangers.
   c. extravagance in entertaining guests.
   d. indifference in treating his friends and relatives.

   Ans (c)

3. **We understand from the passage that:**
   a. all mean people are wealthy
   b. wealthy people are invariably successful.
   c. carefulness generally leads to failure.
   d. thrift may lead to success.

   Ans (d)

4. **It seems that low paid people should:**
   a. not pay their bills promptly.
   b. not keep their creditors waiting.
   c. borrow money to meet their essential needs
   d. feel guilty if they overspend

   Ans (d)
5. **The word paradox means:**
   a. statement based on facts.
   b. that which brings out the inner meaning.
   c. that which is contrary to received opinion.
   d. statement based on the popular opinion.

   Ans (c)

6. **How does the housewife, described by the writer, feel when she saves money?**
   a. is content to be so thrifty.
   b. wishes life were less burdensome.
   c. is still troubled by a sense of guilt.
   d. wishes she could sometimes be extravagant.

   Ans (a)

7. **Which of the following is opposite in meaning to the word applauded in the passage?**
   a. Humiliated
   b. Decried
   c. Cherished
   d. Suppressed

   Ans (b)

8. **The statement she is able to face the milkman with equanimity implies that:**
   a. she is not upset as she has been paying the milkman his dues regularly.
   b. she loses her nerve at the sight of the milkman who always demands his dues.
   c. she manages to keep cool as she has to pay the milkman who always demands his dues.
   d. she remains composed and confident as she knows that she can handle the milkman tactfully.

   Ans (a)

9. **As far as money is concerned, we get the impression that the writer:**
   a. is incapable of saving anything
   b. is never inclined to be extravagant
c. would like to be considered extravagant
d. doesn’t often have any money to save.

Ans (d)

10. Which of the following would be the most suitable title for the passage?
e. Extravagance leads to poverty
f. Miserly habits of the poor.
g. Extravagance in the life of the rich and the poor.
h. Extravagance is always condemnable.

Ans (c)

In the following the questions choose the word which best expresses the meaning of the given word.

CORPULENT

a. Lean
b. Gaunt
c. Emaciated
d. Obese

Ans: D

2. BRIEF

a. Limited
b. Small
d. Little
e. Short

Ans: D

3. EMBEZZLE

a. Misappropriate
b. Balance
c. Remunerate
d. Clear

Ans: A

4. VENT

a. Opening
b. Stodge
c. End
e. Past tense of go

Ans: A

5. AUGUST

a. Common
c. Dignified
e. Petty

Ans: C

6. CANNY

a. Obstinate
b. Handsome
c. Clever
e. Stout

Ans: C
8. **WARRIOR**
   a. Soldier
   b. Sailor
   c. Pirate
   d. Spy

7. **ALERT**
   a. Energetic
   b. Observant
   c. Intelligent
   d. Watchful

**Ans:** D

**Ans:** A

9. **ADVERSITY**
   a. Failure
   b. Helplessness
   c. Misfortune
   d. Crisis

**Ans:** C

10. **STRINGENT**
    a. Dry
    b. Strained
    c. Rigorous
    d. Shrill

**Ans:** C

In the following questions choose the word which is the exact OPPOSITE of the given words.

1. **ENORMOUS**
   a. Soft
   b. Average
   c. Tiny
   d. Weak

**Ans:** C

2. **COMMISSIONED**
   A. Started
   B. Closed
   C. Finished
   D. Terminated

**Ans:** D

3. **ARTIFICIAL**
   A. Red
   B. Natural
   C. Truthful
   D. Solid

**Ans:** B

4. **EXODUS**
   A. Influx
   B. Home-coming
   C. Return
   D. Restoration
Ans: A

5. RELINQUISH
A. Abdicate  
B. Renounce  
C. Possess  
D. Deny  
Ans: C

6. EXPAND
A. Convert  
B. Condense  
C. Congest  
D. Conclude  
Ans: B

7. MORTAL
A. Divine  
B. Immortal  
C. Spiritual  
D. Eternal  
Ans: B

8. QUIESCENT
A. a. ACTIVE  
b. B.  
c. Dormant  
C. d. Weak  
e. D.  
f. Unconcerned  
Ans: A

9. OBEYING
A. a. Ordering  
b. B.  
c. Following  
C. d. Refusing  
e. D.  
f. Contradicting  
Ans: A

10. FRAUDULENT
A. a. Candid  
b. B.  
c. Direct  
C. d. Forthright  
e. D.  
f. Genuine  
Ans: D

Read the each sentence to find out whether there is any grammatical error in it. The error, if any will be in one part of the sentence. The letter of that part is the answer. If there is no error, the answer is 'D'. (Ignore the errors of punctuation, if any).

* 1. (solve as per the direction given above)
   A. a. We discussed about the problem so thoroughly  
   B. b. on the eve of the examination  
   C. c. that I found it very easy to work it out.  
   D. d. No error.  
   Ans: A
2. (solve as per the direction given above)
   A. a. An Indian ship
   B. b. laden with merchandise
   C. c. got drowned in the Pacific Ocean.
   D. d. No error.
Ans: C

3. (solve as per the direction given above)
   A. a. I could not put up in a hotel
   B. b. because the boarding and lodging charges
   C. c. were exorbitant
   D. d. No error.
Ans: A

4. (solve as per the direction given above)
   A. a. The Indian radio
   B. b. which was previously controlled by the British rulers
   C. c. is free now from the narrow vested interests.
   D. d. No error.
Ans: C

6. (solve as per the direction given above)
   A. a. If I had known
   b. B. c. this yesterday
   C. d. I will have helped him.
   e. D. f. No error.
Ans: C

7. (solve as per the direction given above)
   A. a. A lot of travel delay is caused
   B. b. due to the inefficiency and lack of good management
   C. c. on behalf of the railways.
   D. d. No error.
Ans: C

8. (solve as per the direction given above)
   A. a. One of the members
   b. B. c. expressed doubt if
   C. d. the Minister was an atheist.
   e. D. f. No error.
Ans: B

9. (solve as per the direction given above)
   A. a. I have got
   b. B. c. my M.Sc. degree
   C. d. in 1988.
   e. D. f. No error.
Ans: A

10. (solve as per the direction given above)
A. a. Having received your letter b. B. c. this morning, we are writing
C. d. to thank you for the same. e. D. f. No error.
Ans: D

11. (solve as per the direction given above)
A. a. If you lend him a book b. B. c. he will lend it to some one else
C. d. and never you will get it back. e. D. f. No error.
Ans: C

12. (solve as per the direction given above)
A. a. According to the Bible b. B. c. it is meek and humble
C. d. who shall inherit the earth. e. D. f. No error.
Ans: B

13. (solve as per the direction given above)
A. a. Do the roses in your garden smell b. B. c. more sweetly
C. d. than those in ours? e. D. f. No error.
Ans: B

14. (solve as per the direction given above)
A. a. Block of Residential flats b. B. c. are coming up
C. d. near our house. e. D. f. No error
Ans: A

15. (solve as per the direction given above)
A. a. You can get b. B. c. all the information that you want
B. b. in this book.
C. c. No error.
Ans: B

16. (solve as per the direction given above)
A. e. The students were f. B. g. awaiting for
C. h. the arrival of the chief guest. i. D. j. No error.
Ans: B
Comprehension
I felt the wall of the tunnel shiver. The master alarm squealed through my earphones. Almost simultaneously, Jack yelled down to me that there was a warning light on. Fleeting but spectacular sights snapped into and out of view, the snow, the shower of debris, the moon, looming close and big, the dazzling sunshine for once unfiltered by layers of air. The last twelve hours before re-entry were particular bone-chilling. During this period, I had to go up in to command module. Even after the fiery re-entry splashing down in 81° water in south pacific, we could still see our frosty breath inside the command module.

1. The word 'Command Module' used twice in the given passage indicates perhaps that it deals with
   A. a. an alarming journey   b. B. c. a commanding situation
   C. d. a journey into outer space  e. D. f. a frightful battle.
   Ans: C

2. Which one of the following reasons would one consider as more as possible for the warning lights to be on?
   A. a. There was a shower of debris.
   B. b. Jack was yelling.
   C. c. A catastrophe was imminent.
   D. d. The moon was looming close and big.
   Ans: C

3. The statement that the dazzling sunshine was "for once unfiltered by layers of air" means
   e. A. f. that the sun was very hot   g. B. h. that there was no strong wind
   i. C. j. that the air was unpolluted   k. D. l. none of above
   Ans: D

Harold a professional man who had worked in an office for many years had a fearful dream. In it, he found himself in a land where small slug-like animals with slimy tentacles lived on people's bodies. The people tolerated the loathsome creatures because after many years they grew into elephants which then became the nation's system of transport, carrying everyone wherever he wanted to go. Harold suddenly realised that he himself was covered with these things, and he woke up screaming. In a vivid sequence of pictures this dream dramatised for Harold what he had never been able to put in to words; he saw himself as letting society feed on his body in his early years so that it would carry him when he retired. He later threw off the "security bug" and took up freelance work.

1. In his dream Harold found the loathsome creatures
A. a. in his village  b. B. c. in his own house  
C. d. in a different land  e. D. f. in his office  
Ans: C

2. Which one of the following phrases best helps to bring out the precise meaning of 'loathsome creatures'?  
A. a. Security bug and slimy tentacles  
B. b. Fearful dream and slug-like animals  
C. c. Slimy tentacles and slug-like animals  
D. d. slug-like animals and security bug  
ANS: C

3. The statement 'he later threw off the security bug' means that  
A. e. Harold succeeded in overcoming the need for security  
B. f. Harold stopped giving much importance to dreams  
C. g. Harold started tolerating social victimisation  
D. h. Harold killed all the bugs troubled him  
ANS: A

4. Harold's dream was fearful because  
A. i. it brought him face to face with reality  
B. j. it was full of vivid pictures of snakes  
C. k. he saw huge elephant in it  
D. l. in it he saw slimy creatures feeding on people's bodies  
S: A

In questions given below out of four alternatives, choose the one which can be substituted for the given word/sentence.

1. Extreme old age when a man behaves like a fool  
   m. A. n. Imbecility  o. B. p. Senility  
   q. C. r. Dotage  s. D. t. Superannuation  
   u.  
   Ans: C

2. That which cannot be corrected  
   a. A. b. Unintelligible  c. B. d. Indelible  
   e. C. f. Illegible  g. D. h. Incorrigible  
   i.  
   Ans: D

3. The study of ancient societies  
   a. A. b. Anthropology  c. B. d. Archaeology  
   e. C. f. History  g. D. h. Ethnology  
   i.  
   Ans: B

4. A person of good understanding knowledge and reasoning power  
C. d. Snob  e. D. f. Literate

ANS: B

5. A person who insists on something
A. a. Disciplinarian  b. B. c. Stickler
C. d. Instantaneous  e. D. f. Boaster

ANS: B

6. State in which the few govern the many
A. a. Monarchy  b. B. c. Oligarchy
C. d. Plutocracy  e. D. f. Autocracy

ANS: B

7. A style in which a writer makes a display of his knowledge
A. a. Pedantic  b. B. c. Verbose
C. d. Pompous  e. D. f. Ornate

ANS: A

Find the correctly spelt words
1. (solve as per the direction given above)
   A. a. Efficient  b. B. c. Treatmeant
   C. d. Beterment  e. D. f. Employd

ANS: A

2. (solve as per the direction given above)
   A. a. Foreign  b. B. c. Foreine
   C. d. Fariegn  e. D. f. Forein

ANS: A

3. (solve as per the direction given above)
   A. a. Ommineous  b. B. c. Omineous
   C. d. Ominous  e. D. f. Omenous

ANS: C

4. (solve as per the direction given above)
   A. a. Pessenger  b. B. c. Passenger
   C. d. Pasanger  e. D. f. Pesanger

ANS: B

5. (solve as per the direction given above)
   A. a. Benefitted  b. B. c. Benifited
   C. d. Benefited  e. D. f. Benefeted

ANS: C

Pick out the most effective word(s) from the given words to fill in the blank to make
the sentence meaningfully complete.

1. Fate smiles ..... those who untiringly grapple with stark realities of life.
   a. A. b. with c. B. d. over 
   e. C. f. on g. D. h. round
   ANS: C

2. The miser gazed ..... at the pile of gold coins in front of him.
   A. a. avidly b. B. c. admiringly
   C. d. thoughtfully e. D. f. earnestly
   ANS: C

3. Catching the earlier train will give us the ..... to do some shopping.
   A.a. chance b. B.c. luck
   C.d. possibility e. D.f. occasion
   ANS: A

4. I saw a ..... of cows in the field.
   A. a. group b. B. c. herd
   C. d. swarm e. D. f. flock
   ANS: B

5. The grapes are now ..... enough to be picked.
   a. A. b. ready c. B. d. mature 
   e. C. f. ripe g. D. h. advanced
   ANS: C

6. Success in this examination depends ..... hard work alone.
   a. A. b. at c. B. c. over
   C. d. for e. D. f. on
   ANS: D

7. My uncle decided to take ..... and my sister to the market.
   a. A. b. I c. B. d. mine
   e. C. f. me g. D. h. myself
   ANS: C

8. If you smuggle goods into the country, they may be ..... by the customs authority.
   a. possessed b. punished
   d. confiscated f. fined
   ANS: C

9. Man does not live by ..... alone.
   a. food b. bread
   c. meals d. diet
   ANS: B
10. Piyush behaves strangely at times and, therefore, nobody gets ...... with him.
   a. about  b. through  c. along  d. up
   ANS: C

11. Rohan and Rohit are twin brothers, but they do not look ......
   a. unique  b. different  c. likely  d. alike
   ANS: D

12. To err is ...... to forgive divine.
   a. beastly  c. human  e. natural
   d. inhuman
   ANS: B

13. The ruling party will have to put its own house ...... order.
   a. in  b. on  c. to  d. into
   ANS: A
2. NUMERICAL ABILITY
NUMERICAL QUESTIONS

AGE PROBLEMS:

1. Four years ago, the average age of Deena and Prakash was 21 years. With Harish joining then now the average becomes 25 years. How old is Harish now?
   a) 28 years b) 26 years c) 24 years d) 25 years.

   **Answer :** d) 25 years.

   **Solution:**
   Let the present age of Deena, Prakash and Harish be A, B and C respectively.
   4 years ago, the average age of Deena and Prakash was 21 years.
   (i.e.) \((A - 4 + B - 4) / 2 = 21\)
   \(=> A + B = 50 \quad \text{(1)}\)
   But now, the average age of Deena, Prakash and Harish is 25 years.
   (i.e.) \((A + B + C) / 3 = 25\)
   \(=> A + B + C = 75 \quad \text{(2)}\)
   \(2) - (1) => C = 75 - 50 = 25.\)
   Hence, the present age of Harish is 25 years.

2. The present age of Harini’s father is 4 times the present age of Harini. And the age difference of Harini’s father and mother is 5 years. Five years ago, the sum of all the three person’s age was 70 years. What is the present age of Harini’s father?
   a) 44 years b) 40 years c) 50 years d) 48 years

   **Answer :** b) 40

   **Solution:**
   Let the present ages of Father, Mother and Harini be F, M and H respectively.
   Present age of Father = 4 * Present age of Harini
   i.e. \(F = 4H \quad \text{(1)}\)
   Age difference between Harini’s Parent's = 5
   i.e. \(F - M = 5 \quad \text{(2)}\)
   Five years ago, the sum of ages of Father, Mother and Harini is 70 years
   i.e. \(F - 5 + M - 5 + H - 5 = 70\)
   \(=> F + M + H = 85 \quad \text{(3)}\)
   \((2) + (3) => 2F + H = 90 \quad \text{(4)}\)
   Substitute (1) in (4), we get H = 10.
   Then \(F = 4 \times 10 = 40.\)
   Therefore the present age of Harini’s father is 40 years.

3. Haritha told her friends that if she add ten times her age ten years from now to five times her age five years ago is same as the 20 times of her current age. How old Haritha will be ten years from now?
   a) 15 years b) 20 years c) 23 years d) 25 years

   **Answer:** b) 20 years
**Answer**: d) 25 years

Solution:
Let the age of Haritha be X.
Then, 10 times her age after 10 years + 5 times her age before 5 years = 20 times her present age.  
i.e. \(10 \times (X + 10) + 5 \times (X - 5) = 20 \times X\)
\[15X + 75 = 20X\]
\[5X = 75\]
\[X = 15\]
Hence, Haritha’s Present age is 15 years.
So, after 10 years, Haritha’s age will be 25 years.

4. Three years ago, the ages of Geetha, Reena and Surya are in the ratio of 3:4:5. Three years hence, the sum of their ages is 78. What is the age of Reena at present?

a) 18 years  b) 23 years  c) 28 years  d) 20 years
**Answer**: b) 23 years

Solution:
Let the ages of Geetha, Reena and Surya 3 years ago be 3X, 4X and 5X respectively.
After 3 years, the sum of their ages is 78.
\[i.e. \ (3X + 3) + 3 + (4X + 3) + 3 + (5X + 3) + 3 = 78\]
\[12X = 60\]
\[X = 5\]
Hence, Reena’s present age is 4X + 3 = 4(5) + 3 = 23 years.

5. Somayaji Rao, retired Sub-Inspector of Police, Nandyal, Kurnool District, Andhra Pradesh has three grand children. The age of the eldest grand child is four times the age of youngest grand child. It is also seen that the second grand child’s age is half of the eldest grand child. The sum of the ages of all three grand children is 48. What is the age of eldest grand child?

a) 48 b) 24 c) 12 d) 30
**Answer**: b) 24

Solution:
Let the age of youngest grand child be X. Middle grand child age be Y and eldest grand child be Z years.
Given \(Z = 4X\) ...(1)
Also \(Z = 2Y\) ...(2)
From 1 and 2 we get, \(4X = 2Y\)
Or \(Y = 2X\)
In terms of X the age of three grand children = X, 2X, 4X
It is given that the sum of the ages of all the three grand children = 48
\[X + 2X + 4X = 48\]
\[X = 6\]
So youngest grand child's age = 6
Eldest grand child age = 4 X = 4 x 6 = 24 years
6. Four years ago, the age of Kamalhasan was three times the age of his daughter. The total of the ages of Kamalhasan and his daughter after four years will be 64 years.

**What is the present age of Kamalhasan?**

a) 40 years  b) 36 years  c) 60 years  d) none of these.

**Answer:** a) 40 years

**Solution:**

Let the age of Kamalhasan before four years be $K$ and that of his daughter be $D$

Four years ago $K = 3D$ ...(1)

If four years ago Kamalhasan's age was $K$, today his age will be $K + 4$, after 4 years his age will be $K + 4 + 4$

If four years ago daughter's age was $D$, today her age will be $D + 4$, after 4 years her age will be $D + 4 + 4$

Four years afterwards the sum of the ages of the two will be 64 years.

So $(K + 4 + 4) + (D + 4 + 4) = 64$

But from eq 1, we know that $K = 3D$. Therefore above equation becomes

$(3D + 4 + 4) + (D + 4 + 4) = 64$

$4D + 16 = 64$

$4D = 64 - 16 = 48$

$D = 12$

So Kamalhasan’s present age = $K + 4 = 3D + 4 = (3 \times 12) + 4 = 40$ years

7. Brahmananda Sastri is grand father of three sons of his son. Nelson one of his grand son is three times older than another grand son Thompson. His third grand son James is not in station. He is studying in a school Ootacamund. Nelson’s age after three years will be six times the age of Thompson one year ago. What is the present age of Nelson?

a) 6  b) 12  c) 9  d) 15

**Answer:** c) 9

**Solution:**

The name of grand father and details about the third grand son are all time consumers. Candidates should be alert to read and consider only what is required to answer the question.

Let the present age of Nelson be $N$ and the present age of Thompson be $T$

Then $N = 3T$ ...(1)

Nelson’s age after three years will be six times the age of Thompson one year ago.

Formulating this in the form of equation we get,

$N + 3 = 6(T-1)$

Substituting for $N$ as $3T$ (from 1) we get

$3T + 3 = 6T - 6$

$3 + 6 = 6T - 3T = 3T$

$9 = 3T$

$3 = T$

So Nelson’s age is $3T = 3 \times 3 = 9$ years.

8. The ratio of the ages of Mohanapriya and Kulandaivelu is 3 : 4. Four years earlier the ratio was 5 : 7. Find the present age of Kulandaivelu.

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LOGICAL REASONING:

9. Statement :: Men cause more accidents than women while driving. However men are still better drivers than women. Question :: Which of the following is true considering the above statement
a) Men drive much faster than women
b) Percentage of women causing accidents is greater than that of men.
c) Percentage of men causing accidents is greater than that of women.
Answer : Clear answer is "b) Percentage of women causing accidents is greater than that of men". The inference from this statement is that though men cause more accidents, there are more men drivers than women and hence more accidents from men. However the percentage of men drivers causing accidents is lesser than that of women.

10. Statement :: There is another planet X similar to earth where the total time taken for the completion of an year matches the duration of 365 days and 6 hours. However the total time taken for 4 years to get completed in that planet X matches exactly to that of the earth. How is this possible ?? Question :: Which of the following is true considering the above statement
a) Earth revolves slower than that of the planet X.
b) Leap year accounts for the delayed time of planet X.
c) Clocks measure times differently in both the planets.
Answer : Answer would be "b) Leap year accounts for the delayed time of planet X". During leap year the number of days become 366. The extra one day (24 hours) accounts for 4 years of delay between times of planet X and earth.

11. Statement :: Total economy of India is much higher than that of United Kingdom. But an average Indian man has lesser income than that of a man from UK. Question :: Which of the following is true considering the above statement
a) Currencies in India and UK are different.
b) Though Indian economy is larger the population of India is huge.
c) UK has more jobs than India.
Answer : Correct answer is "b) Though Indian economy is larger the population of India is huge." Since population of India is much higher than that of UK, the income per individual in India is lesser than that of UK.

12. Mr. Kohli had a doubt regarding a situation and he approached Mahendra for clarification. The question read as under:--
One of four people –two men Raman and Krishnan and two women, Sonam and Kala -- were murdered.

Hint : Raman's sister is Krishnan's wife and vice versa.
1) Raman’s sister argued exactly once with Sonam’s legal husband after the murder.
2) Krishnan’s sister argued twice with the victim’s legal spouse after the murder.
Help Mahendran identifying the victim?
a) Krishnan b) Raman c) Sonam d) none of these.

Answer : a) Krishnan.

Solution :
1) Raman’s sister argued exactly once with Sonam’s legal husband after the murder.
2) Krishnan’s sister argued twice with the victim’s legal spouse after the murder.

From both the statements, we can see that the victim has to be a MAN as both the sisters were involved in arguments after the murder.

To solve such problems, we will have to assume a Victim and check the possibility of all statements. If even one of the statements is logically impossible then our nearest assumption would be false.

1) Assume Raman is the victim.
1a) Assume Raman's Sister is Kala
(If Raman's Sister is Kala then Krishnan's sister has to be Sonam. Also Raman's wife has to be Sonam and Krishnan's wife has to be Kala.)
As per statement I, Kala would had argued with Raman after the murder. – Impossible. (But since we have assume Raman is the victim this is not possible.)

1b) Assume Raman's Sister is Sonam
(If Raman's Sister is Sonam, then Krishnan's Sister would be Kala, Raman's Wife would be Kala and Krishnan's wife would be Sonam)
As per statement I, Sonam would had argued with Krishnan after the murder. - Possible
As per statement II, Kala would had argued with Kala after the murder.- Impossible. (Kala cannot argue with herself)

2) Assume Krishnan is the victim.
2a) Assume Raman's Sister is Kala
(If Raman's Sister is Kala then Krishnan's sister has to be Sonam. Also Raman's wife has to be Sonam and Krishnan's wife has to be Kala.)
As per statement I, Kala would had argued with Raman after the murder. - Possible
As per statement II, Sonam would had argued twice with Kala after the murder. – Possible
All the statement hold good if Krishnan is the victim provided Raman’s sister is Kala.

2b) Assume Raman's Sister is Sonam
(If Raman's Sister is Sonam, then Krishnan's Sister would be Kala, Raman's Wife would be Kala and Krishnan's wife would be Sonam)
As per statement I, Sonam would had argued with Krishnan after the murder. – Impossible
(as we have assumed Krishnan is the victim)
13. Consider the below statements. One of the friends is lying while others are saying the truth. Find the person who is lying.
   1) Ram says he is taller than both Ravi and Rahul
   2) Raju says he is not taller than Ram and Ravi
   3) Rahul says he is taller than Rajan and also adds he is neither taller nor shorter than Ravi
   4) Rajan says he is taller than Ram
   5) Ravi says he is taller than Rajan
   a) Ravi b) Rajan c) Ram d) Rahul e) Raju
   Answer : b) Rajan

Solution :
Based on the statements given, let us start arranging the people in order of their heights.
As per statement 1, Ram is taller than both Ravi and Rahul. Also from second part of statement 3, we can easily say that Rahul is equal in height to that of Ravi.

**Arrangement** : Ram, Ravi, Rahul
As per statement 2, Raju is shorter than both Ram and Ravi

**Arrangement** : Ram, Ravi, Rahul, Raju
As per statement 3, Rahul is taller than Rajan

**Arrangement** : Ram, Ravi, Rahul, Rajan, Raju (as of now we will assume Rajan is taller than Raju)
As per statement 4, Rajan is taller than Ram,
Here is the catch! Rajan is clearly shorter than Ram from statements 1 and 3. Now if we assume Rajan is speaking the truth then we will have to conclude both Ram and Rahul are lying. But the question clearly says only one of the friends is lying. Hence statement 4 is false and Rajan is lying.
(Additional Information : As a matter of fact, Ravi is also saying truth as his statement perfectly falls in line with the arrangement we made so far...)

14. Consider four brothers A,B,C,D. A is the eldest of all.
The immediately younger brother to A always plays with the youngest brother among all four.
D is the immediately elder brother to the youngest brother.
Find the brother who is immediately younger to A.
a) B b) C c) either B or C d) can’t be determined
   Answer : c) either B or C

Solution :
It is given that A is the eldest of all and D is immediately elder to the youngest brother. Hence one among B and C has to be the youngest and the other one has to be immediately younger to A. But data in question is insufficient to arrive at the right person amongst B and C.

15. Sneha is engaged. Her Fiance is one amongst Abdul, John, King and Vimal. Sneha either speaks truth or lies. One of four men always speaks truth while others may or may not speak the truth. Now based on the below statements, can you find the Fiance?
   1) Abdul says "Sneha always speaks truth".
2) King says "Sneha always lies".
3) Vimal says "Sneha always speaks truth but only to him".
4) John says "The only truth speaking person amongst Vimal and John is Sneha's Fiance".
   a) Abdul  b) King  c) Vimal  d) John.
   **Answer : d) John**

Solution :
From the question, we know clearly that Sneha can speak either Truth or Lies. But as per statement (1) Abul says "Sneha always speaks truth". Hence this statement cannot be true. Hence our inference is that Abdul always lies.
As per statement (2) King says "Sneha always lies". Again this statement is false as Sneha can speak either Truth or Lies. Hence we can infer that King always lies.
On statement (3) Vimal says "Sneha always speaks truth but only to him". But there is no evidence / proof for this claim on data in question. Hence we can safely consider that Vimal also lies always.
In question it is clearly given that one of four men always speaks truth while others may or may not speak the truth. Since we have concluded Abdul, King and Vimal always lie, John should be the only truth speaking man.
According to statement (4) John says that "The only truth speaking person amongst Vimal and John is Sneha's Fiance". Since John is found to speak truth always, this particular statement from John should be absolutely True.
Also we have found earlier that Vimal always lies. Hence the truth speaking person John has to be the Fiance.

16. Three men Ravi, Ram, Rahul and two women Rekha and Padma were seated next to each other (not in order given) in a meeting. The arrangement was that the person who speaks definitely the truth will occupy the first position and the person who speaks definite lie always will be the last. The middle three positions will be filled by people whose statements may be truth or may be false. Can you find the correct arrangement from the options based on the statements below :
   1) Padma says the probability of her occupying the 4th place is lesser than the probability of her occupying 1st place.
   2) Rahul says that "Padma lies always when calculating probability"
   3) Rekha says "Ram is the tallest of the 5 people"
   4) Ram says "He does not know probability"
   a) Rahul - Ravi - Rekha - Ram - Padma b) Ravi - Rahul - Rekha - Ram - Padma
   c) Rekha - Rahul - Ravi - Padma - Ram d) Rahul - Ravi - Ram - Padma -Rekha
   **Answer : a) Rahul - Ravi - Rekha - Ram - Padma**

Solution :
Though the question looks bit difficult it is actually a simple question provided you can quickly extract out only required data and ignore irrelevant details. All the options have different combinations for 1st and last positions. This means, if you are smart enough to find the person who always speaks truth and the person who always speaks lies, it is more than enough to answer the question.
According to statement I, Padma says that the probability of her occupying the 4th place is lesser than the probability of her occupying 1st place. But this cannot be true. This is
because probability of Padma to occupy any given position is 1/5. (1/5 is the probability of Padma to occupy any given position be it 1st or 2nd or 3rd or 4th or 5th positions). Therefore we can safely conclude that Padma is definitely lying.

According to statement 2, Rahul says "Padma lies always when calculating probability". This is a definite truth based on our conclusion in previous paragraph. We can safely conclude that Rahul speaks definitely the truth.

From the above two paragraphs, we can say that 1st position will be occupied by Rahul (as he speaks definite truth) and the last position will be occupied by Padma (as she speaks definite lies). Only option that has this combination is option a) and hence the answer.

DIVISIBILITY OF NUMBERS:

17. Mylapore Times a local free newspaper conducted a test for students studying in corporation schools falling within the jurisdiction of Chennai. The test was aimed at ascertaining the level of mathematics knowledge among the school students. The following question was given:

“How many numbers are there between 133 to 294 both included, which are divisible by 7?”

a) 23 b) 24 c) 26 d) none of these.

Answer : b) 24.

Solution :
In this problem both the boundary numbers 133 and 294 are divisible by 7. Also the boundary numbers are inclusive for calculation. In such scenarios solving is very simple.

Quotient 1 (when upper boundary number is divided by the divisor, in our case 7) : When 294 is divided by 7 we get 42. (1)

Quotient 2 (when lower boundary number is divided by the divisor, in our case 7) : When 133 is divided by 7 we get 19. (2)

Answer can be obtained using the formula, Quotient 1 - Quotient 2 + 1 = 42 - 19 + 1 = 24

42 - 19 = 23 + 1 = 24

18. Porur Times is a newspaper which is distributed free to residents in and near Porur. It carries advertisement on different aspects such as rental, real estate, tuition, business deals etc. Porur Times gave a puzzle and wanted answers to be emailed to them within a day. The question read as under:

“How many three digit numbers can be formed using the digits 1,2,3,4,5 (but with repetition) that are divisible by 4?”

a) 12 b) 20 c) 60 d) 10

Answer : b) 20

Solution :
To solve this problem, we are going to utilize the simple rule that for a number to be divisible by 4, its last two digits must be divisible by 4.

Using digits present in 1,2,3,4,5 the two digit combination's that are divisible by 4 include 12, 24, 32, 44

Now placing any of the digits from 1,2,3,4,5 before the 2 digit numbers that we arrived in previous step, we can actually find the total number of 3 digit numbers formed from
1, 2, 3, 4, 5 that are divisible by 4.
They are,
112, 124, 132, 144
212, 224, 232, 244
312, 324, 332, 344
412, 424, 432, 444
512, 524, 532, 544
Therefore there are 20 numbers which is our answer.

19. Kumaresh attended a placement examination online and the following question was posed to him:
“The difference between the squares of two consecutive odd integers is always divisible by” which of the following:
a) 6  b) 8  c) 7  d) 3
Answer : b) 8

SOLUTION:
Let the two consecutive odd integers be (2x + 1) and (2x + 3).
Then, $(2x + 3)^2 - (2x + 1)^2$
$4x^2 + 12x + 9 - 4x^2 - 4x - 1 = 8x + 8 = 8(x + 1)$.
Now for any value of x, $8(x + 1)$. is divisible by 8. Therefore, answer is 8.

PROBABILITY QUESTIONS

20. Two countries - Germany and France are participating in a hockey game. Mr. Randor Guy, the famous astrologer in Germany is able to predict the winner of each match with great success. It is rumoured that in a match between 2 teams X and Y, Rando Guy picks X with the same probability as X's chances of winning. Let's assume such rumours to be true and that in a match between Germany and France, Germany the stronger team has a probability of 7/10 of winning the game. What is the probability that Randor Guy will correctly pick the winner of the Germany - France game?
a) 0.58 b) 0.68 c) 0.82 d) 0.42
Answer : a) 0.58

Solution :
Randor Guy predicts the winner in games with the same probability of winning. --> statement I
Germany has got a chance of winning the game with 7/10 probability. France has got a chance of winning the game with 3/10 probability.
Probability of Randor Guy picking the Germany correctly is 7/10 while picking France is 3/10 (as per statement I).
Probability of Randor Guy picking the winning team correctly = (Probability of Germany winning the game) AND (Probability of Randor Guy picking Germany correctly) OR (Probability of France winning the game) AND (Probability of Randor Guy picking France correctly).
Note : In probability related formulas generally AND translates to x and OR translates to + Therefore, Probability of Randor Guy picking the winning team correctly = (Probability of Germany winning the game) * (Probability of Randor Guy picking Germany correctly) +
(Probability of France winning the game) * (Probability of Randor Guy picking France correctly).
Probability of predicting winning team = (7/10 * 7/10) + (3/10 * 3/10)
=0.58

21. A box has 45 chocolates of different colours 20 red, 15 white and 10 black chocolates. If a chocolate is chosen at random, what is the probability of that being white chocolate?
   a) 1/2 b) 1/3 c) 2/3 d) 3/4
   Answer : b) 1/3
   Solution :
   Note : This is a simplest of the simple questions that you can expect on probability. This is a usual case in placement tests. You should be able to identify such simple questions amidst tough questions. At times, you could get mislead by thinking this is a tricky one.
   Any of 45 chocolates could be chosen. So, totally there are 45 possibilities. Since there are only 15 white chocolates, only 15 possibilities can lead to a white chocolate. Hence P(white chocolate) = 15/45 or 1/3.

22. In an off campus placement programme, a software company recruiter interviewed 75 prospective candidates -- 10 from Civil engineering department, 5 from Bio-chemical department and rest from computer science department. If the software company finally issued offer letter to 17 candidates, what is the probability that all the selected candidates belonged to only computer science department?
   a) 60C17/ 75C17 b) 65C17/75C17 c) 70C17/75C17 d) None of these.
   Answer : a) 60C17/75C17
   Solution :
   17 out of 75 candidates selected in 75C17 ways. 17 out of 60 from computer science department can be selected in 60C17 ways.
   So the required probability = Ways of selecting 17 computer science candidates / Ways of selecting 17 candidates from all departments
   = 60C17 / 75C17

23. 12 leading companies were brought into an issue in deciding about the allocation of land related properties by a Government agency. The companies were numbered from 2 to 12. Among these the companies numbered 7,9 and 10 were three leading business rivals. It was decided to use two dice and bet on the numbers emerging out of such throws. It was seen that results range from 2 to 12. Out of such throws which of the following: 7 or 9 or 10 is likely to appear more often than the other numbers? (i.e will any of the companies will have advantage over the others with the method followed.)
   a) 10 b) 9 c) 7 d) all are equally possible.
   Answer : c) 7
   Solution :
   Let (x,y) represent any throw of a dice where x represents number of I dice and y represents number on II dice
   When two dice are thrown possible occurrences of 7 include : (1,6), (6,1), (2,5) (5,2) (3,4),
When two dice are thrown possible occurrences of 9 include: (3,6), (6,3), (4,5), (5,4)
When two dice are thrown possible occurrences of 10 include: (5,5), (5,5)

Sum 7 can appear in at least 6 combinations as against 9 which occurs in 4 combinations and 10 which occurs in 2 combinations. Hence company 7 should have more chances of winning the bid over the others.

24. Three school friends studying in a Higher Secondary School studying in standard 10, 11 and 12 respectively met in a leading five star hotel in a tea party. During discussions they had an argument about the chances of getting specific numbers by the throw of 2 dice. Which two numbers from 9, 10 and 11 will have equal chances of appearing.
   a) 9, 10 b) 10, 11 c) 9, 11 d) none of the above
   Answer: b) 10, 11

Solution:
The solution to this question is very similar to that of the first question.
When two dice are thrown possible occurrences of 9 include: (3,6), (6,3), (4,5), (5,4)
When two dice are thrown possible occurrences of 10 include: (5,5), (5,5)
When two dice are thrown possible occurrences of 11 include: (5,6), (6,5)

Therefore 9 can appear in 4 possible combinations, 10 can appear in 2 possible combinations and 11 can appear in 2 possible combinations. Therefore numbers 10 and 11 have equal chances of appearing during the throw of two dice.

25. Mrs. Kalyani Chatterjee of Bhubaneshwar went abroad and settled in USA about twenty years ago. She returned on an holiday trip to Bhubaneshwar and went to Konarak Sun Temple for sightseeing. To her surprise she met ten of her classmates at Konarak. What is the probability that at least one of the ten people she met has the same birth day as that of Mrs. Kalyani Chatterjee. Her birth day – 14th March.
   a) 0.0028 b) 0.014 c) 0.128 d) none of these.
   Answer: a) 0.0028

Solution:
Probability of a friend having birthday on same date as that of Kalyani = 1/365
Probability of a friend not having birthday on same date as that of Kalyani = 1 - 1/365 = 364/365
Probability of 2 friends not having birthday on same date as that of Kalyani = (364/365) x (364/365) = (364/365)^2
Similarly Probability of n friends not having birthday on same date as that of Kalyani = (364/365)^n
Now, Probability of n friends having birthday on same date as that of Kalyani = 1 - Probability of n friends not having birthday on same date as that of Kalyani = 1 - (364/365)^n
Substituting n = 10 in above formula we get,
1 - (364/365)^10 = 0.0028
26. Three students of Victory Engineering College - Saravanan, Meenakshi and Mangesh were given a mathematics problem. If their chances of solving the problem are 60%, 50% and 40%, what is the probability the problem will be solved?

a) 0.33 b) 0.66 c) 0.77 d) 0.88

**Answer : d) 0.88**

Solution:
For solving such problems one has to employ the below simple equation:

\[ P(\text{problem is solved}) = 1 - P(\text{problem is not solved}) \]

In other words, \( P(\text{problem is solved}) = 1 - P(\text{none of the students solve the problem}) \) \( \Rightarrow \) eq 1

But probability of no one solves the problem can be found using the below equation

\[ P(\text{none of the students solve the problem}) = P(\text{Saravanan being not able to solve}) \times P(\text{Meenakshi being not able to solve}) \times P(\text{Mangesh being not able to solve}) \]

\[ = [1 - P(\text{Saravanan solving the problem})] \times [1 - P(\text{Meenakshi solving the problem})] \times [1 - P(\text{Mangesh solving the problem})] \]

\[ = (1 - 0.6)(1 - 0.5)(1 - 0.4) = 0.3 \times 0.5 \times 0.6 = 0.12 \]

\( \Rightarrow \) eq 2

Substitute the value for \( P(\text{none of the students solve the problem}) \) from eq 2 in eq 1, we get:

\[ P(\text{problem is solved}) = 1 - 0.12 = 0.88 \]

27. The New College, Chennai conducted NCC shooting camp at St. Thomas Mount. Students were asked to participate in the shooting competition. Four students – Goutham, Malavika, Geetha and Vinya participated in the competition. If the probability of their hitting the target Apple correctly is 0.7, 0.6, 0.5 and 0.4 respectively, what is the probability that four shots aimed at the target will hit correctly?

a) 0.964 b) 0.624 c) 0.824 d) 0.756

**Answer : a) 0.964**

Solution:
The target Apple will be brought down even if one of the four shots hit the target.
The opposite of this is the situation when none of the shots hit the target.
The probability of none of the shoot hits the target = \( P(\text{Goutham missing the target}) \times P(\text{Malavika missing the target}) \times P(\text{Geetha missing the target}) \times P(\text{Vinya missing the target}) \)

\[ = [1 - P(\text{Goutham hitting the target})] \times [1 - P(\text{Malavika hitting the target})] \times [1 - P(\text{Geetha hitting the target})] \times [1 - P(\text{Vinya hitting the target})] \]

\[ = (1-0.7)(1-0.6)(1-0.5)(1-0.4)=0.3*0.4*0.5*0.6=0.036 \]

So, the probability that at least one of the shoots hits the target Apple = 1 - probability of none of the shots hits the target = 1 – 0.036 = 0.964.

28. In the tenth standard class of St. Michael’s School, Palayamkottai, 30% of the students were offered Tamil, 20% were offered Telugu and 10% were offered both. If a student is selected at random, what is the probability that he has offered Tamil or Telugu?

a) 2/5 b) 3/4 c) 3/5 d) 3/10

**Answer : a) 2/5.**
Solution:

\[ P(\text{Student offered Tamil}) = \frac{\text{Students offered Tamil}}{\text{Total Students}} = \frac{30}{100} = \frac{3}{10}, \]
\[ P(\text{Telugu}) = \frac{\text{Students offered Telugu}}{\text{Total Students}} = \frac{20}{100} = \frac{1}{5} \]

And
\[ P(\text{Students offered both Tamil and Telugu}) = P(\text{Tamil} \cap \text{Telugu}) = \frac{10}{100} = \frac{1}{10} \]

Probability that a selected student at random has been offered Tamil or Telugu can be found by the below simple formula:

\[ P(\text{Tamil or Telugu}) = P(\text{Tamil} \cup \text{Telugu}) = P(\text{Tamil}) + P(\text{Telugu}) - P(\text{Tamil} \cap \text{Telugu}) \]
\[ = \left( \frac{3}{10} + \frac{1}{5} - \frac{1}{10} \right) = \frac{4}{10} = \frac{2}{5} \]

29. For the IPL 5 cricket matches Mr. Bala Josiar has been predicting the winner of each match with amazing success. It is rumored that in a match between 2 teams X and Y, Bala Josiar picks X with the same probability as X’s chances of winning. Let’s assume such rumors to be true and that in a match between Rajasthan Royals and Chennai Super Kings, Chennai Super Kings the stronger team seems to have a probability of 3/4 of winning the game. What is the probability that Bala Josiar will correctly pick the winner of the Rajasthan Royals–Chennai Super Kings game?

a) 7/16  b) 9/16  c) 3/4  d) 10/16

Answer: d) 10/16

Solution:

Probability that CSK wins = 3/4
Probability that RR wins = 1 - Probability that CSK wins = 1 - 3/4 = 1/4

Probability of picking a winner = Probability of picking RR x Probability that RR wins + Probability of picking CSK x Probability that CSK wins

Bala Josiar picks with the same probability of a team’s chance of winning. This means, Probability of picking RR = Probability that RR wins and Probability of picking CSK = Probability that CSK wins

Therefore, Probability of picking a winner = \((Probability that \text{CSK wins})^2 + (Probability that \text{RR wins})^2\)
\[ = \left( \frac{3}{4} \right)^2 + \left( \frac{1}{4} \right)^2 \]
\[ = \frac{9}{16} + \frac{1}{16} \]
\[ = \frac{10}{16} \]

30. Mr. Randor Guy, the famous astrologer staying at Anna Nagar, Chennai has been able to predict the winner of each Hockey match with amazing success. It is told in the sports circle that in a match between two teams A and B, Mr. Randor Guy picks A team with the same probability as A’s chances of winning. But he seems to be incapable of predicting a tie. Let us assume such rumors to be true and that in a match between Pakistan and India, India the stronger team has a probability of 2/3 of winning the game. Based on past data it is also estimated that the probability of match getting tied is 1/9. What is the probability that Randor Guy will correctly pick the winner of the Pakistan-India game?

a) 4/9  b) 2/3  c) 52/81  d) none of these.

Answer: c) 52/81

Solution:
This question is very similar to the previous question, except the fact that there is a probability of tie as well. 
Probability of India winning = 2/3  
Probability of Pakistan winning = 1 - Probability of India winning - Probability of Tie  
= 1 - 2/3 - 1/9 = 1 - 5/9 = 4/9  
So probability of picking a winner = probability of picking Pakistan* Probability of Pakistan winning + probability of picking India* Probability of India winning + probability of picking a tie x probability of tie ....(1)  
Randor Guy picks with the same probability of a team’s chance of winning. Therefore, Probability of picking Pakistan = Probability of Pakistan winning, Probability of picking India = Probability of India winning. Also we know that he is unable to predict a tie. Therefore, probability of picking a Tie = 0. 
Applying above in eq (1) we get, 
probability of picking a winner = (Probability of Pakistan winning )^2+(Probability of India winning)^2+ 0 x probability of tie  
= ( 4/9 * 4/9) + ( 2/3* 2/3) + 0  
= 16/81 + 4/9  
= (16 + 36) / 81  
= 52/81

31. Om Navasakthi Astrologers, Chennai has been able to predict the winner of each football match with amazing success. It is told in the sports circle that in a match between two teams A and B, Om Navasakthi Astrologers picks A team with the same probability as B’s chances of winning and vice versa. Let us assume such rumors to be true and that in a match between Germany and Brazil, Brazil the stronger team has a probability of 4/7 of winning the game. What is the probability that Om Navasakthi Astrologers will correctly pick the winner of the Germany-Brazil game? 
1) 24/49 b) 4/7 c) 18/49 d) none of these.

Answer : a) 24/49

Solution: 
This is similar to earlier questions except the fact that Astrologers pick A team with the same probability as B’s chances of winning and pick B team with the same probability as A's chances of winning. 
Probability of Brazil winning = 4/7. Therefore, Probability of Germany winning = 1 - 4/7 = 3/7  
So probability of picking a winner = probability of picking Brazil*Probability of Brazil winning + probability of picking Germany * Probability of Germany winning ....(1)  
Astrologers pick A team with the same probability as B’s chances of winning and pick B team with the same probability as A's chances of winning. Therefore, Probability of Brazil winning = probability of picking Germany and Probability of Germany winning = probability of picking Brazil 
Applying this in eq (1) we get 
probability of picking a winner = ( 3/7 * 4/7) + ( 4/7* 3/7)  
= 12/49 + 12/49  
= 24/49

SPEED DISTANCE and TIME
32. A Maruti Swift car started from Chennai towards Mumbai at 7 am. A Tata Indigo car newly purchased started from Chennai at 10 am towards Mumbai and the second vehicle was able to cross the first vehicle at 6 pm on the same day. If Tata Indigo was running at an average speed of 80 km per hour what would have been the speed of Maruti Swift car?

a) 64.24 km/hour  b) 59.12 km/hour  c) 58.18 km/hour  d) 65.42 km/hour  

**Answer :** c) 58.18 km/hour

**Solution :** 
Tata Indigo car had taken 8 hours to cross Maruti Swift running at 80 km/hour. 
Distance covered by Tata Indigo in 8 hours = 80 x 8 = 640 km 
This distance has been covered by Maruti Swift in 11 hours (as it started at 7 am and was crossed by Tata Indigo at 6 pm) 
So average speed of Maruti Swift = 640 /11 = 58.18 km/hour

33. An Ashok Leyland Truck started from Ennore factory towards Kolkata at 6 am and it was running at an average speed of 60 km per hour. Another Tata Truck started from Ennore at 8.30 am and crossed the Ashok Leyland at 4.30 pm. What is the average speed of Tata Truck?

a) 78.75 km/hour  b) 74.75 km/hour  c) 72.50 km/hour  d) 76.85 km/hour  

**Answer :** a) 78.75 km/hour

**Solution :** 
Ashok Leyland has run 10 ½ hours before the trucks met at an average speed of 60 km/hour 
Distance covered by Ashok Leyland - 60 x 10 ½ = 630 km 
This distance has been covered by Tata Truck in 8 hours (as it started at 8.30 am and crossed the other truck at 4.30 pm) 
Average speed of Tata Truck = 630 / 8 = 78.75 km/hour

34. A Tata Indica car started from Hyderabad towards Madurai at 5.30 am and travelled at an average speed of 50 km/hour. An Innova car started at 8.30 am from Hyderabad again towards same destination at an average speed of 66 2/3 km/hour. At what time Innova will cross the Tata Indica Car?

a) 4.30 pm  b) 5.30 pm  c) 3.30 pm  d) 6.40 pm  

**Answer :** b) 5.30 pm

**Solution :** 
Tata Indica starts at 5.30 which is 3 hours before Innova started. Therefore it has run for 3 hours at 50 Km/hr speed. Hence Tata Indica car has run 50 x 3 = 150 km by the time Innova starts. 
The relative speed of Innova car = Innova Speed - Indica Speed = 66 2/3 - 50 = 16 2/3 km/hour 
(Note: To calculate relative speed we are subtracting Indica's speed from Innova's speed as they travel in same direction. If they were travelling in opposite directions we would had added the speeds.)

Innova will take Distance/Relative Speed = (150) / (16 2/3) = 9 hours. 
So Innova will cross Tata Indica 9 hours after 8.30 am i.e at 5.30 pm
35. When a lady weighing 48 kg jogged at the rate of 10 km per hour the rate of
dissipation of energy was twice that of when she was walking at the rate of 5 km per
hour. Similarly the rate of dissipation of energy was higher during summer time than
during the winter time. An athlete ran at the rate of 8 km per hour to the victory post
and returned at 6 km per hour to the starting point. What is the average speed of the
athlete?
a) 5 6/7 km/hr b) 6 6/7 km/hr c) 4 6/7 km/hr d) none of these
Answer : b) 6 6/7 km/hr

Solution :
Suppose a man covers a certain distance at x km/hr and an equal distance at y km/hr. Then,
the average speed during the whole journey is \[\frac{2xy}{x+y}\] km/hr.
Applying the formula to athlete's case we get his average speed to be
2 x 8 x 6 divided by (8 +6) = 48/7 = 6 6/7 km/hr.

36. A bus was travelling from Koyambedu to Salem Bus Stand via Vellore. A bus was
travelling at a speed of 72 km per hour. However when taking into account the
stoppage time the average speed became 60 km/hour. How many minutes does the bus
stops in an hour?
a) 8 min b) 12 min c) 15 min d) 10 min.
Answer : d) 10 min.

Solution :
Due to stoppages, the speed is reduced by 12 km/hr.
In other words, the time that the bus would had taken to drive for 12 Km will be equal to
stoppage time per hour.
Time taken to cover 12 km = 12/72 x 60 = 10 min = Stoppage Time.

37. Ram, John and Govind are walking from Marina Beach to Chengalput. Their
speeds are in the ratio 4 : 3 : 5. The ratio of the time taken by them to reach Guindy by
these persons will be:
a) 15:20:12 b) 4:3:5 c) 15:9:20 d) none of these.
Answer : a) 15:20:12

Solution :
For such problems, one can safely assume distances and speeds but in accordance with the
constraints given in the question. For example, if you are going to assume the speeds of
Ram, John and Govind, then they should be in the ration 4:3:5. That is their speeds can be
4,3 and 5 Km/hr or 8,6 and 10 Km/hr or 16,12 and 20 Km/hr and so on.
Similarly, the distance from marina to guindy is not given in the question. This means that
irrespective of the distance the answer would be same. Hence you can assume any distance
from marina to guindy. However, if you assume the distance to be the LCM or multiples of
LCM of speeds that is 4,3 and 5, the calculation will become very simple. For example, the
LCM of 4,3 and 5 is 60. Hence you can assume the distance to be 60 or 120 or 180.... etc.
In our case, let us assume the speeds to be 4,3 and 5 Km/hr and Distance to be 60 Km.
Ratio of time taken by the three = Distance / Speed of Ram : Distance / Speed of John :
Distance / Speed of Govind
= 60/4:60/3:60/5 = 15:20:12
WORK AND TIME:

38. Thirty men take 20 days to complete a job working 9 hours a day. How many hours a day should 40 men work to complete the job?
   (a) 8 hrs
   (b) 7 1/2 hrs
   (c) 7 hrs
   (d) 9 hrs
   Ans. (b)

39. Find the smallest number in a GP whose sum is 38 and product 1728
   (a) 12
   (b) 20
   (c) 8
   (d) none of these
   Ans. (c)

40. A boat travels 20 kms upstream in 6 hrs and 18 kms downstream in 4 hrs. Find the speed of the boat in still water and the speed of the water current?
   (a) 1/2 kmph
   (b) 7/12 kmph
   (c) 5 kmph
   (d) none of these
   Ans. (b)

41. A goat is tied to one corner of a square plot of side 12m by a rope 7m long. Find the area it can graze?
   (a) 38.5 sq.m
   (b) 155 sq.m
   (c) 144 sq.m
   (d) 19.25 sq.m
   Ans. (a)

42. “Hunterkey” a leading software company situate in China was started in the year 1988. The company had been progressing well since inception and the company has achieved a turn over of over 10 billion $. The management of the company has plans for achieving greater heights in terms of turnover and has been training its members in various skills such as technical skills, soft skills, programming skills etc. 60 programmers of the company write 60 lines of programs in 60 minutes totally. How long will it take for 84 programmers to write 84 lines of programs?
   a) 84 min.  b) 48 min  c) 60 min  d) 72 min
   Answer: c) 60 min.
For problems like this where efficiency of the programmers/workers are assumed constant implicitly, you can apply the below formula
\[ P_1 \times M_1 / L_1 = P_2 \times M_2 / L_2 \]
Here, \( P_1, M_1 \) and \( L_1 \) are number of programmers, number of minutes and number of lines respectively in case I
And, \( P_2, M_2 \) and \( L_2 \) are number of programmers, number of minutes and number of lines respectively in case II.
Given \( P_1 = 60, M_1 = 60, L_1 = 60, P_2 = 84, L_2 = 84 \).
Substituting in above formula we get.
\[ 60 \times 60 / 60 = 84 \times M_2 / 84. \]
Simplifying we get, \( M_2 = 60 \) minutes.

43. “Universal Software Inc.” USA is situated in California. The company was started in the year 1975 and has been progressing extremely well. It is aiming to reach the topmost position in the near future. During the year 2010, in a team, on any particular day, 48 programmers of the company were able to write 48 lines of software programs in 48 minutes. The company recruits 72 more programmers. Also the team management improves the throughput by making them to work for 72 more minutes every day. What will be the increase of the number of lines of code possible now?
(a) 300 lines  
(b) 252 lines  
(c) 48 lines  
(d) 48 lines  
**Answer** : (b) 252 lines

Solution :
Using the same formula as in first question :
\[ P_1 \times M_1 / L_1 = P_2 \times M_2 / L_2 \]
Given, \( P_1 = 48, M_1 = 48 \) and \( L_1 = 48 \)
Given \( P_2 = P_1 + 72 = 48 + 72 = 120 \)
Given \( M_2 = M_1 + 72 = 48 + 72 = 120 \)
Substituting values in formula we get,
\[ 48 \times 48 / 48 = 120 \times 120 / L_2 \]
Simplifying we get \( L_2 = 300 \)
Increase in number of lines of code = \( L_2 - L_1 = 300 - 48 = 252 \)

44. “Extremely fast solutions” a software programmer provider has been training its manpower in such a way that 36 programmers could write 36 software programs of similar nature in 36 hours. The company has received an order for getting 84 software programs of similar nature in 24 hours. How many additional programmers should the company employ for this project?
(a) 90  
(b) 42  
(c) 66  
(d) 44  
**Answer** : (a) 90

Solution :
Using the same formula as in first question (Note : \( M_1 \) and \( M_2 \) denote time in hours and not minutes. Left hand side and Right hand side should have same units and thats the deal.)
\[ P_1 \times M_1 / L_1 = P_2 \times M_2 / L_2 \]
Given \( P_1 = 36, M_1 = 36, L_1 = 36 \).
Given \( L_2 = 84, M_2 = 24 \)
Substituting we get,
36 x 36 / 36 = P2 x 24 / 84
Or P2 = 36 x 84 / 24 = 126
Number of additional programmers = P2 - P1 = 126 - 36 = 90.

45. A company has three staff members working in communications department. They are Peter, Satish and Raju. The company has received a work of sending communication to its potential customers. The time the three take to complete the dispatch work together is 2 days less than Peter would have taken to do it alone, 10 days less than Satish to do the work alone and one-third of the time that Raju would have taken working alone. How many days will the three people take to do the dispatch of all the mails working together?
a) 2 days b) 4 days c) 5 days d) 3 days
Answer : a) 2 days.

Solution :
Let the number of letters to be dispatched be X.
If the three people together take ‘D’ days to complete the work then
Peter will take (D +2) days to complete it alone.
Satish will take (D + 10) days to complete it alone.
And Raju will take 3 D days to complete it alone.
Speed of Peter --- X / (D+2) letters per day
Speed of Satish -- X / (D + 10) letters per day
Speed of Raju -- X / 3D letters per day
All of them working together for one day will dispatch –
X/(D+2) + X/(D+10) + X/3D letters -> eq 1
Number of days it will take for them to complete the dispatch of all the X letters = X /
Letters that can be dispatched by all of them in one day = X / [ X/D+2 + X/D+10 + X/3D]
But we had assumed the number of days to dispatch all X letters as D.
Therefore, D = X / [ (X/D+2) + (X/D+10) + (X / 3D)]
Or X/D = (X /D+2) + (X/D+10) + (X/3D)
Or 1/(D+2) + 1/(D+10) + 1/ 3D = 1 /D
Substituting the options one by one, we can find that D = 2 satisfies the equation.
i.e Substitute D = 2 in both sides of 1/(D+2) + 1/(D+10) + 1/ 3D = 1 /D.
Substituting D = 2 On LHS : 1/4 + 1/12 + 1/6 = 6/12 = 1/2
On RHS D = 2 we get 1/2
Therefore, LHS = RHS when D =2 and hence 2 is the right answer

46. Roja and Edward were working in a courier company. Roja takes 6 hours to pack 32 parcels while Edward takes 5 hours to pack 40 parcels. How long they will take to pack 330 parcels working together?
a) 24 hours 45 minutes b) 23 hours c) 25 hours 15 minutes d) none of these.
Answer : c) 25 hours 15 minutes

Solution :
Speed of Roja per hour = 32/6 parcels
Speed of Edward per hour = 40/5 = 8 parcels
When both of them work together in one hour they will pack
32/6 + 8 = 13 1/3 parcels
For packing 330 parcels it will take \( \frac{330}{\text{parcels that can be packed by them in one hour}} \) = \( \frac{330}{13 \frac{1}{3}} \) = 25 hours 15 minutes

47. An overseas software company entrusted the work to a company in India. The Indian company conducted campus recruitment drives and recruited men and women on a large scale. It gave training to newcomers in its training centre with advanced facilities at Mysore for over three weeks. The company conducted periodical tests to assess the progress in terms of knowledge and output of its employees in order to ensure uniform output being given by all the employees. Company’s 48 programmers wrote 48 lines of program in 36 minutes. How many programmers are required to write 192 lines program in 24 minutes.

a) 24 b) 36 c) 288 d) 72

Answer: c) 288

Solution:

<table>
<thead>
<tr>
<th>Programmers</th>
<th>Lines</th>
<th>Minutes</th>
</tr>
</thead>
<tbody>
<tr>
<td>48</td>
<td>48</td>
<td>36</td>
</tr>
<tr>
<td>?</td>
<td>192</td>
<td>24</td>
</tr>
</tbody>
</table>

For such problems where efficiency of programmers are considered to be the same, one can employ the equation

\[
P_1 \times M_1 / L_1 = P_2 \times M_2 / L_2 \rightarrow \text{eq 1}
\]

Where \( P_1, M_1 \) and \( L_1 \) are the number of programmers, minutes and lines of code respectively in I case and \( P_2, M_2 \) and \( L_2 \) are the number of programmers, minutes and lines of code respectively in II case.

From the question, we can find that \( P_1 = 48, M_1 = 36, L_1 = 48, M_2 = 24 \) and \( L_2 = 192 \). \( P_2 \) is to be found out.

Substituting the above values in equation 1 we get,

\[
(48 \times 36) / 48 = (P_2 \times 24) / 192
\]

Or, \( P_2 = (48 \times 36 \times 192) / (48 \times 24) = 288 \)

APTITUDE QUESTIONS:

48. Rearrange the letters in the word "RAPAKETE" and find the right synonym for the new word from the following.

a) Bird
b) Reptile
c) Animal
d) Cow

Solution:

While answering these types of questions it is better to keep all the choices in mind while rearranging. This could help you to arrive at the solution in a quick time. The rearranged word for the above question is "PARAKEET" which means a) Bird.

49. If Resistance is denoted by \( X \), Current by \( Y \) and voltage by \( Z \) (in standard units) which is correct?
a) $Z = XY$
b) $Z = X/Y$
c) $Z = Y/X$
d) None of the above

Solution:
This question is actually from basic physics. This is from Ohm's law which sure everyone one of you would have studied during high school. Ohm's Law is $V = IR$ where $V$ is the voltage, $I$ is the current and $R$ is the resistance. Comparing this law with the question the answer would be a) $z = XY$

50. A Pizza shop serves pizzas with any of 8 different toppings as chosen by customers. John is a customer who likes to buy two pizzas with different toppings. In how many ways he can do that?

Solution:
For the first pizza John can choose any of the 8 toppings. Hence he has 8 choices. For the second pizza he can choose from remaining 7 toppings.
In effect he can buy the two pizzas in $8 \times 7 = 56$ ways (this means he has in total of 56 ways to choose his two pizzas).

51. A person travels at a speed of 4kmpH from A to B and returns to A with a speed of 5KmpH. Find his average speed.

Solution:
Average speed = total distance / total time taken
Let the distance from A to B be $x$.
Let $t_1$ be the time taken from A to B and $t_2$ be the time taken from B to A (returning time).
Then average speed = $2x / (t_1 + t_2)$
Here $t_1 = x/4$ and $t_2 = x/5$ (speed = distance/time formula is applied here)
Applying these values in the first equation we will get average speed = 4.44.

52. Chandrasekaran worked very sincerely in the software company which selected him in the campus recruitment. At the end of the first year he was given a salary increase of 5%. In the second year another friend from his college also joined the company and they spent more time together. As a result of this performance of Chandrasekaran came down in terms of the team leader. The team leader recommended a cut of 2.5% from the salary of Chandrasekaran. In the third year at the end of the first month he received Rs.34398 as salary and felt aggrieved. He started thinking about resigning from this company and try for other companies which pay a higher salary. What was the salary of Chandrasekaran at the beginning of first year?
a) Rs.32400  b) Rs.36800  c) Rs.22000  d) Rs.33600
Answer : d) Rs. 33600

Solution:
Let the salary at the beginning of first year be Rs.$X$
At the beginning of second year it will then be 5% more than his beginning salary.
Therefore his second year salary = 105% of $X = 105X/100$
On this 2.5% reduction, his salary now will be 2.5% lesser than his second year salary = 
97.5% x Second Year Salary = (97.5/100)(105X/100) – But this value is given as Rs.34398
Solving (97.5/100)(105X/100) = 34398, we get,
X = 34398 x 100 x 100 divided by 105 x 97.5
= Rs. 33600

53. Miss. Ranjitha bought a new wall clock which rings at every one hour. At 3 O’
clock the clock ticks 3 times and at 4 O’ clock the clock ticks 4 times. At 4 O’ clock the
time between the first tick and the last tick is 21 seconds. How long does it tick at 12
O’ clock?
a) 66 seconds b) 55 seconds c) 77 seconds d)44 seconds
Answer : c) 77 seconds

Solution :
This is a simple problem. The gap between the first tick and the last tick at 4 O’ clock is 3
gaps. Time taken = 21 seconds. That means between two gaps it takes 7 seconds.
At 12 O clock there will be 11 gaps. Total time for 11 gaps = 77 seconds.
Though the question could look confusing at first, this is actually a very simple questions.
With practice, you should be ready to identify these kinds of questions which could
potentially save a lot of your time during tests.

54. Anushka has a jewel chest containing Rings, Pins and Ear-rings. The chest
contains 26 pieces. Anushka has 2 1/2 times as many rings as pins, and the number of
pairs of ear rings is 4 less than the number of rings. How many earrings does Anushka
have?
a) 12 b)8 c)6 d)10
Answer : a) 12

Solution :
Assume that there are R rings, P pins and E pair of ear-rings.
It is given that, she has 2 1/2 times as many rings as pins.
R = (5/2) * P or P = (2*R)/5
And, the number of pairs of earrings is 4 less than the number of rings.
E = R - 4 or R = E + 4
Also, there are in total 26 pieces.
R + P + 2*E = 26
R + (2*R)/5 + 2*E = 26
5*R + 2*R + 10*E = 130
7*R + 10*E = 130
7*(E + 4) + 10*E = 130
7*E + 28 + 10*E = 130
17*E = 102
E = 6
Hence, there are 6 pairs of Ear-rings i.e. total 12 Ear-rings

55. Ramesh Khanna was five times old as his son Kishan Khanna eight years ago. Now
he is three times as old as his son Kishan Khanna. Assume they both live in a country
where people understand only binary numbers and they use symbol '0' for binary 1
and '1' for binary zero. Also they add 1 before any binary number. Express Ramesh Khanna’s present age in accordance to that world
a) 1001111 b) 1001111 c) 1100011 d) 1010000
Answer : a) 1001111

Solution :
Let Ramesh Khanna’s age be represented as ‘F’ eight years ago and the age of Kishan Khanna be represented as ‘S’.
F = 5 S
F + 8 = 3 (S + 8)
5S + 8 = 3S + 24
5S – 3S = 24 – 8
2S = 16
S = 8
Now Ramesh Khanna’s age will be 5S + 8 = (5x8) + 8 = 48
Expressed as binary 110000 . However the people in their country use symbol 0 for binary one and 1 for binary zero. Replacing 1 with 0 and 0 with 1 we get 001111. Also those people usually add 1 before any binary number. Hence the answer becomes 1001111.

56. Bhavna is presently three times as old as her daughter Anushka. Ten years ago Bhavna was five times as old as her daughter Anushka was. After how many years, sum of their ages will be 100.
a) 10 b) 20 c)15 d) none of these.
Answer : a) 10

Solution :
Let Bhavna’s present age be represented as B
Let her daughter Anushka’s age be represented as A.
B = 3 A
Ten years ago,
B - 10 = 5(A – 10)
3A - 10 = 5A - 50
-10 + 50 = 5A – 3A = 2 A
40 = 2 A
A = 20.
B = 3 x A = 60.
Present sum of their ages = A + B = 80.
When 10 is added to both A and B, Sum of their ages will become 100. Hence, after 10 years, their sum of ages will be 100.

57. Monisha was seven times as old as her daughter Mercy eight years ago. Now three times Mercy’s age is her mother age. Before how many years the ratio of their ages (ratio of mother's age to Mercy's age) will be increased by 1 from the current ratio
a) 5 b) 4 c) 8 d) none of these.
Answer : b) 4

Solution :
Eight years ago -- let Monisha’s age be M and Mercy’s age be D.

\[ M = 7D \]
\[ M + 8 = 3(D + 8) \]
\[ 7D + 8 = 3D + 24 \]
\[ 7D - 3D = 24 - 8 = 16 \]

D = 4 = age of Mercy before 8 years

M = 28 = age of Mother before 8 years

Current age of Mercy = D + 8 = 12

Current age of Monisha = M + 8 = 36

Current ratio of mother's age to Mercy's age = 36/12 = 3.

Let before x years this ratio becomes 1 more than the current ratio. i.e x denotes the number of years before which the ratio becomes 3 + 1 = 4.

Then \( \frac{36 - x}{12 - x} = 4 \)

\[ 36 - x = 48 - 4x \]
\[ 3x = 12 \]
\[ x = 4 \]

i.e before 4 years, the ratio of their ages will be 4. Therefore answer = 4

ARRANGEWMENT QUESTIONS:

59. Mohan bought a new bike. The number plate consists of 4 digits. How many 4-digit numbers can be formed for the number plate of Mohan’s bike from the digits 2, 4, 6, 7, 5 and 8 which are divisible by 5 with the condition that none of the digit is repeated?
   a) 60 b) 30 c) 24 d) 120
   Answer : a) 60

Solution :
Since the number on number plate is divisible by 5, the last digit should be 5 only. (0 is not allowed as per the question)
And the first digit can be filled by any of the remaining numbers (2, 4, 6, 7 and 8).
So, the number of ways of filling first digit without repetition = 5 ways
And the second digit can be filled by the remaining 4 numbers.
So, the number of ways of filling second digit without repetition = 4 ways
Therefore, number of ways of selecting 4-digit number is 5 x 4 x 3 x 1 = 60.

60. A family went to a studio to take a family photo. There are 5 members in that family namely a husband and his wife and their 3 children. In how many ways they can be made to stand (arranged) to take a photo in such a way that the husband is adjacent to his wife?
   a) 80 ways b) 30 ways c) 120 ways d) 60 ways
   Answer : b) 30 ways

Solution :
Number of ways of placing husband = 5 ways
Since husband must be adjacent to his wife, number of ways of placing wife = 1 way (near husband)
There are three spots remaining :
Any of the three children can be made to stand in first place. Therefore there are 3 ways to
fill this spot. Any of the remaining two children can be made to stand in the second spot. Therefore there are 2 ways to fill this spot. The third spot can be filled in one way as there will be only one child remaining. Therefore, the number of ways of arranging the five members = 5 x 1 x 3 x 2 x 1 = 30

61. Anand has to send 5 different greeting cards to his 5 friends. His five friends are located in Chennai, Mumbai, Bangalore, Delhi and Mysore. In how many ways he can send the greetings to his friends such that no friend is getting 2 greeting cards? 
a) 80 ways b) 30 ways c) 120 ways d) 60 ways
Answer: c) 120 ways

Solution:
The number of ways of sending the first greeting card is 5 ways 
Since no friend has to get two greeting cards, 
The number of ways of sending the second greeting card is 4 ways. 
The number of ways of sending the third, fourth and the fifth greeting card are 3, 2 and 1 ways. 
Hence the number of ways of sending all the 5 greeting cards = 5 x 4 x 3 x 2 x 1 = 120 ways

62. Consider two cars A and B. Speed of A is 10 Kmph. Speed of B is 3 times faster than that of A. What will be the ratio of time taken by B to cover the same distance as that of A. 
Explanation: Time and Speed problems always find their place in TCS recruitment papers. Speed of B = 3 X 10 = 30 Kmph. Hence B can cover 3 times the distance that can be covered by B in a given time. In other words, B takes one third or 1/3 of time taken by A to cover the same distance. Hence answer would be 1/3.

63. Find the missing number in the given sequence : 1,2,3,5,?,13,21,?
Explanation: These kinds of questions have become common in TCS papers. The given sequence is a fibonacci series. any third number can be got by summing the first and second numbers. Hence the missing number would be 3 + 5 = 8.

64. There was a question asking for the area of a trapezium with dimensions of the sides given. 
Example:

Formula for the area will be (a + b)/2 X h = (half of the sum of parallel sides) X (perpendicular distance between the parallel sides)

68
65. Next was a very simple question on encoding and decoding. Below is an example question of similar nature:
If NOIDA is written as STNIF, how MEERUT can be written in that code?

Solution: NOIDA is being written as STNIF. Here every letter is replaced by the fifth letter from the letter under observation. For example the fifth letter after N is S and fifth letter after O is T. Applying the same logic, MEERUT can be written as RJJWZY.

66. TCS papers always do carry questions from AGE problems. This paper was no exception. Below is a sample question of similar nature.
The ratio of Rita's age to her mother's age is 3:8. The difference of their ages is 35 years. The ratio of their ages after 4 years will be ------- .

Solution:
Let their ages be 3x and 8x
8x - 3x =35
x =7
Their present ages are 21 and 56 years.
Ratio of their ages after 4 years are 25:60 = 5:12

67. Find the smallest number such that if its rightmost digit is placed at its left end, the new number so formed is precisely 50% larger than the original number.
Answer
The answer is 285714.

68. There is a 4-character code, with 2 of them being letters and the other 2 being numbers. How many maximum attempts would be necessary to find the correct code?
Note that the code is case-sensitive.
Answer
The maximum number of attempts required are 16,22,400

69. How many possible combinations are there in a 3x3x3 rubics cube? In other words, if you wanted to solve the rubics cube by trying different combinations, how many might it take you (worst case senerio)? How many for a 4x4x4 cube?
Answer
There are 4.3252 * 10^19 possible combinations for 3x3x3 Rubics and 7.4012 * 10^45 possible combinations for 4x4x4 Rubics.

70. There are 20 people in your applicant pool, including 5 pairs of identical twins. If you hire 5 people randomly, what are the chances you will hire at least 1 pair of identical twins? (Needless to say, this could cause trouble ;)
Answer
The probability to hire 5 people with at least 1 pair of identical twins is 25.28%

71. In the construction of a house these were required Designer and Painter equals Rs. 1100 Painter and Plumber equals Rs. 1700 Plumber and Electrician equals Rs. 1100
Electrician and Constructor equals Rs. 3200 Constructor and Mechanic equals Rs. 5300 Mechanic and Painter equals Rs. 3200 What are their individual costs?

Ans: Designer=200; Painter=900; Plumber=800; Electrician=300; Constructor=3000; Mechanic=2300

72. complete the following series 1, 5, 14, 30, 55, 91, 140,…
Ans: 204

73. Two men arrived at the airport with 64 and 20 bottles of wine respectively. For paying custom duty first one give 40 francs and 5 bottles of wine. second one give 2 bottles of wine and in return he got 40 francs .so,what the price of each bottle of wine and also what the duty for each bottle?
Ans: 120 francs and 10 francs

74. I lost my wallet and the money in that. But I remember that before I lost my wallet I purchased to things. First one I purchased by paying 10% of what in my wallet and also for second one i also pay 10% of what has been left in my wallet- that is equal to 9. then how much money I lost?
Ans: 81

75. A car is traveling at a uniform speed. The driver sees a milestone showing a 2-digit number. After traveling for an hour the driver sees another milestone with the same digits in reverse order. After another hour the driver sees another milestone containing the same two digits separated by a zero. What is the average speed of the driver?
Ans : 45 kmph

76. Adding 1/4 of the time from midnight to the present time, to 1/2 of the time from present until midnight, gives the present time. what is the present time.
Ans :9.36

77. Light glows for every 13 seconds . How many times did it between 1:57:58 and 3:20:47 am
Ans : 383 + 1 = 384

78. A chain is broken into three pieces of equal length containing 3 links each. It is taken to a blacksmith to join into a single continuous one. How many links are to be opened to make it ?
Ans : 2.

79. 'male of an elephant and male of a bird
make a combo phrase, to believe - it's so hard.'
which phrase am i hinting to?
Solution:
COCK AND BULL STORY

80. m*n^2 * ( m + n^2 ) = 2^13 .solve for m and n by deduction.
Solution:
Assuming that we're looking for integers, \( m, n^2, \) and \( m + n^2 \) are all powers of 2. The third is only possible if \( m = n^2 \).
Let \( m = 2^x, \) then
\[
2^x * 2^x * 2^{(x+1)} = 2^{13}
\]
\[
3x + 1 = 13
\]
\[
x = 4
\]
which gives \( m = 16, n = 4. \)

PROBLEMS ON PROFIT AND LOSS

81. A man buys certain number of steel rods priced at Rs. 7 per rod for Rs. 120. He then sells them at a loss of 25%. What will be his loss amount for every 100 steel rods.
   a)Rs. 180 b) Rs.175 c) Rs.170 d) Rs.160
   Answer : b) Rs.175

Solution :
This is a simple question where not all data given in question is required to find the answer. Since the question is on the loss amount for 100 steel rods, we are not interested in the money spent by the man in buying a certain number of rods he desired.
Now lets get into the solution :
Cost of each rod = Rs. 7
Loss percentage of 25% corresponds to a loss of \( 7 \times 25/100 \) on each rod.
Loss on each rod = \( 7 \times 25/100 = Rs. 7/4 \)
Therefore loss on 100 rods = loss on each rod x 100 = \( 700/4 = Rs. 175 \)

82. One day, a man buys 100 apples at Rs. 6 per fruit and 100 guavas at Rs. 4 per fruit. He sells 100 apples and 100 guavas on the following day. Due to drop in demand for guavas, the man sells guavas at Rs. 3 per fruit. However he manages to sell apples at a profit. At what price he must sell each apple so that he balances out the loss due to guavas.
   a) Rs.6.50 b) Rs.7.25 c) Rs.7 d) Rs.6.75
   Answer : c) Rs.7

Solution :
Cost price of 100 guavas = \( 4 \times 100 = Rs. 400 \)
Selling price of 100 guavas = \( 3 \times 100 = Rs. 300 \)
Loss made on selling 100 guavas = \( 400 - 300 = Rs. 100 \)
To balance the above loss, the man has to sell Apples so that he makes a profit of Rs.100
Cost price of 100 apples = \( 6 \times 100 = 600 \)
To make a profit of Rs.100 he has to sell 100 apples at Rs.600 + Rs.100 = Rs. 700
Selling price of each apple = \( 700/100 = Rs. 7 \)

83. A man buys 50 mangoes from a shop for Rs 5 per fruit. In the next shop he buys 100 mangoes at Rs 4 per fruit. He mixes mangoes purchased from both shops. Now at what price he must sell each mango to get a profit of 25% on each fruit he sells.
   a) Rs.5.4 b) Rs.5.2 c) Rs.5.3 d) Rs.5.5
Answer : a) Rs. 5.4

Solution :
Total money spent on first 50 mangoes = Rs. 50 x 5 = Rs. 250
Total money spent on next 100 mangoes = Rs. 100 x 4 = Rs. 400
Net amount spent on all 150 mangoes = Rs. 250 + Rs. 400 = Rs. 650
Effective cost price of each mango = Rs. 650/150 = Rs. 13/3
Selling price of each mango so as to gain 25% profit = cost price x 125/100 = 13/3 x 125/100 = Rs 5.4 (approximately)

PROBLEMS ON NUMBERS

84. If N is a whole number, then \( N^2(N^2 - 1) \) is always divisible by one of the following:
   a) 24  b) 12  c) 12 - N  d) none of these.
Answer : b) 12

Solution :
Assume \( N = 2 \), we get \( N^2(N^2 - 1) = 12 \). So \( N^2(N^2 - 1) \) is always divisible by 12.
When \( N \) is 3 or 4 or 5, \( N^2(N^2 - 1) \) is divisible by 12 and 24 also. But where \( N \) is 6 or 9, \( N^2(N^2 - 1) \) is not divisible by 24. Another important point is 24 cannot be the choice because the resultant number \( N^2(N^2 - 1) \) is less than 24 when \( N = 2 \). Thus, in all cases \( N^2(N^2 - 1) \) values are divisible by 12 and not by 24 or 12 - N.

85. Ashwini asked Aishwary a doubt on the following: “A 4 digit number is formed by repeating a 2 digit number such as 1313, 4545, 6363 etc”. Any number of this form is exactly divisible by:
   a) 8  b) 11  c) 14  d) smallest 3-digit prime number
Answer : d) smallest 3-digit prime number (101)

Solution :
Smallest 3-digit prime number is 101.
1313 = 13 x 101
4545 = 45 x 101 etc. and so on.
Hence each such 4 digit number formed by repeating a 2 digit number is divisible by smallest 3-digit prime number 101.

86. An intelligent boy told the number of birds in a different way as follows:
   “If one fifth of birds flew to jackfruit tree, one third flew to the mango tree, three times the difference of these two numbers flew to Banyan tree and one bird continued to fly about, attracted on each side by different trees, what was the total number of bees?
   a) 15  b) 18  c) 19  d) 21.
Answer : a) 15.

Solution :
It is given that one fifth of birds flew to jackfruit tree, one third flew to the mango tree. This means that the number of birds should be divisible by 5 and 3. 15 is the only number among the options divisible by three and also five.
PROBLEMS ON AGES

87. Rajarajan retired after serving in Indian army as Lt. Colonel. Rajarajan's age is 20 times that of number of daughters he has. Each of his daughters has as many daughters as they have sisters. If total number of grand daughters of Rajarajan is 1/3rd of the number of daughters, find the age of Rajarajan.
a) 72 b) 90 c) 80 d) 70
Answer : c) 80

Solution I :
Let the number of daughters of Rajarajan be - x
No. of sisters each daughter has - (x-1)
No. of daughters for each daughter - (x-1)
Then total number of grand daughters - Number of daughters x Number of grand daughter per daughter = x (x - 1)
It is given that total number of grand daughters of Rajarajan is 1/3rd of the number of daughters.
Therefore x = 1/3 (x (x - 1))
Or x - 1 = 3 or x = 4.
It is given that Rajarajan's age is 20 times that of number of daughters.
Therefore, his age = 20 X 4 = 80.
Solution II : (short cut)
Actually there is a simpler short cut to this problem. Since it is given that Rajarajan's age is 20 times that of number of daughters , his age should be divisible by 20. Among the options given only 80 is divisible by 20. Hence it is the answer.

88. There are three employees in a software company in different levels. They have put in different years of service in the company. Arul is as much younger than Babu as he is older than Siva. If the sum of the ages of Babu and Siva is 60 years, what is definitely the difference between Arul's age and Babu's age?
a) 1 year b) 2 years c) 30 years d) data inadequate.
Answer : d) data inadequate.

Solution :
Babu's age - Arul's age = Babu's age - Siva's age => Arul's age = Siva's age => (1)
Also Babu's age + Siva's age = 60
From eq (1) we know Siva's age is equal to Arul's age. Then above equation becomes, Babu's age + Arul's age = 60 . However, from this equation one cannot find the difference between Babu's age and Arul's age. Hence data is inadequate.

89. Manivannan has two sons. The age of Manivannan is three times the sum of the ages of his two sons. Five years hence, his age will be double the sum of the ages of his two sons. What is the present age of Manivannan?
a) 45 years b) 33 years c) 48 years d) 54 years
Answer : a) 45 years.

Solution :
Let the sum of the present ages of two sons of Manivannan be S. 
Then, Manivannan’s present age = 3S years -----\> 1
Five years hence, his age will be double the sum of the ages of his two sons. After 5 years 
the sum of the ages of son will be S + 10 -----\> 2 (adding 5 years to each of the two sons)
According to above condition,
Manivannan’s Age after 5 years = 2 ( Sum of the ages of the two sons after 5 years )
Manivannan’s Present Age + 5 = 2 ( Sum of the ages of the two sons after 5 years )
Substituting values from 1 and 2 on above equation we get,
(3S +5) = 2(S+10) => 3S +5 = 2S + 20 => S = 15
Hence present age of Manivannan = 3 S = 3 x 15 = 45 years.

91. 1!*2!*3!*4!* 5!*6!*... ........ ......100! .find the number of zero?
Solution:
4! has no 5
5! to 9! each has one five
10! to 14! each has 2 five etc
25! has 5+1= 6 etc in this way u can make series
4!*5(1+2+3+4+6+7+8+9+10+12+13+14+16+18+19+20+21+22+24)
= 5*(sum(1 to 24 ) - 5 -11 - 17 - 23)
= 5*(24*25/2 - 56)
= 5*(300-56)
= 1220 number of zeros.....

92. The total number of digits in all the page numbers of a book.I am reading now is 1689 . How many pages does my Book have ?
Solution:
9 + 2*90 + 3*x = 1689
so x = 500
so ther are 599 pages.
Problems on Speed, Distance and Time:

93. A kangaroo makes 8 laps in a given time where as a rabbit makes 12 laps in the same time. However, the Kangaroo covers 5 meters per lap whereas the rabbit covers 2 meters per lap. The rabbit and kangaroo are having a race where the rabbit is 30 metres ahead of the kangaroo. After how many laps the kangaroo will catch up with the rabbit ?
(a) 13 (b) 14 (c) 15 (d) Never (e) None of these
Answer : c) 15

Solution:
Let us assume Kangaroo makes 8 laps in 24 minutes.
Then as per question data, rabbit will make 12 laps in same 24 minutes.
Speed of Kangaroo in laps/minutes = 8/24 = 1/3 laps/minutes
Speed of Rabbit in laps/minutes = 12/24 = 1/2 laps/minutes
Kangaroo covers 5 meters in each lap. Therefore speed of Kangaroo in meters/minutes
= 5/3 meters/minutes
Rabbit covers 2 meters in each lap. Therefore speed of rabbit in meters/minutes = \( \frac{2}{2} = 1 \) meters/minutes

Now let us come to the actual question part of finding the distance after which Kangaroo will catch up with Rabbit, provided Rabbit is already 30 meters ahead.

Relative velocity of Kangaroo with respect to Rabbit = \( \frac{5}{3} - 1 = \frac{2}{3} \) meters/minutes

Time taken for Kangaroo to catch up with Rabbit = \( \frac{\text{Initial Distance of Separation}}{\text{Relative Velocity Of Kangaroo with respect to Rabbit}} \)
= \( \frac{30}{\frac{2}{3}} = 45 \) minutes.

But we already know, Kangaroo's speed in laps/minutes = \( \frac{1}{3} \) which means it will make 1 lap for every 3 minutes. Therefore in 90 minutes it will make \( \frac{45}{3} = 15 \) laps.

**94.** Janaki gets on to the elevator at the 8th floor of a building and rides up at the rate of 60 floors per minute. At the same time, Ajay gets on another elevator at the 71st floor of the same building and rides down at the rate of 66 floors per minute. If they continue travelling at these rates, then in which floor will their paths cross?

a. 31st floor  
b. will never cross  
c. 38th floor  
d. 12th floor

**Answer:** c. 38th floor

**Solution:**

Speed of Janaki upwards = 60 floors/min  
Speed of Ajay downwards = 66 floors/min  
No of floors in between 8th and 71st floors = 71 - 8 = 63 floors

Let t be the time after which they cross each other. In other words, after t minutes the number of floors covered by Ajay downwards added to the number of floors Janaki covers upwards should be equal to 63 floors. Putting this in the form of an equation we get:

\[60t + 66t = 63\]

Or \(126t = 63\)

Or \(t = \frac{63}{126} = \frac{1}{2}\) minutes

Therefore, in half a minute both will cross each other. Floors travelled by Janaki upwards in 1/2 min can be found as below:

<table>
<thead>
<tr>
<th>Time</th>
<th>Floors</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>60</td>
</tr>
<tr>
<td>1/2</td>
<td>?</td>
</tr>
</tbody>
</table>

Floors travelled by Janaki upwards in 1/2 min = \(60/2 = 30\) floors

Since Janaki already starts from 8th floor, the floor of crossing counted from ground floor will be 8 + 30 = 38th floor.

**95.** In the famous rail station of Boston Town, an escalator is moving downwards. Karthik takes 60 steps to reach the bottom of the escalator from top. His friend Prabhu, takes 140 steps to reach the top from bottom. The speeds of Karthik and Prabhu are equal. Karthik was posing a question as how many steps were there from top to bottom. Can you guide Prabhu?

(a) 200 (b) 72 (c) 84 (d) 78

**Answer:** c) 84

**Solution:**

Assume escalator moves down at n steps/min  
Let speed of Karthik be 1 step/min.
Therefore for 60 steps he would had taken 60 mins.
In 60 minutes, escalator would had moved 60n steps
So total steps would be 60 + 60n ...(1)
Since we have assumed speed of Karthik is 1 step/min, speed of Prabhu should also be 1 step/min as it is given in question that both are travelling at same speed.
For 140 steps, Prabhu would have taken 140 minutes.
In 140 minutes, the escalator would had moved down by 140n steps.
Therefore total steps = 140 - 140n ...(2) (since escalator is moving in opposite direction, we are using - sign)
Since both equations 1 and 2 denote total number of steps, we can equate them as below
60 + 60n = 140 - 140n
200n = 80
Or n = 2/5
Substitute n = 2/5 in eq 1 we get
Total number of steps = 60 + 60(2/5) = 84 steps.

96. Two goats were standing 700 metres apart. One goat is standing at the western gate and another is standing at eastern gate. They move forward for two minutes at the rate of 50 metres per minute initially. Then they move backward for two minutes at the rate of 25 metres per minute. The process continues. When will the two goats meet/hit the other?
a) 20 min b) 22 min c) 26 min d) 28 sec
Answer : b) 22 min.

Solution :
For every 2 min. the two goats will come nearer by 200 metres. In the next 2 min. the two goats will go backwards 50 metres back and hence after every 4 minutes goats would have come nearer by 100 metres. The process continues. Hence after 20 min the two goats would have come nearer by 500 metres. At the end of 22 mins the two goats will meet each other.

97. A new type of study about movement of trains was conducted by South Central Railway. Two trains are standing 2520 metres apart in two adjacent railway lines. Both the trains move for five seconds at 60 m/sec. They halt for 12 seconds. Then again they start moving for five second at 60 m/sec. The process continues. After how many seconds will the engines of the two trains cross in the adjacent railway lines?
a) 50 sec b) 60 sec c) 70 sec d) none of these.
Answer : c) 70 sec.

Solution :
The two trains are standing 2520 metres apart in two adjacent railway lines. After every five second they come closer by 600 metres.\((300 + 300)\). They halt for 12 seconds and then start moving. So after every 17 seconds they come closer by 600 metres. The process continues. After 68 second they would have covered 2400 metres. So in the next two seconds that is after 70 second the engines of the two trains will cross each other in adjacent line having covered 2520 metres.

98. Kumaresan Environment Industries Limited, planted a tree. The tree was growing at 6 cm every day. The tree was allowed to grow for ten days. On the 11th day the tree
will be cut to 50% of its size. From the next day (12th day) for the next ten days it was allowed to grow at the rate of 6 cm every day. On the 11th day the tree is cut to 50% of its size. The process continued. Assuming the tree was planted afresh as a seed after how many days the tree would have reach a height of 105 cms?

a) 32 days  b) 26 days  c) 18 days  d) none of these.

Answer : a) 32 days

Solution :
For ten days the tree grows at 6 cm per day and it will reach a height of 60 cm.
On the 11th day its height will be reduced to 50% of its size – 30 cm.
Till 21st day the tree will grow further 60 cm and reach a height of 90 cms.
On 22nd day its height would have been reduced to 45 cm.(50%)
It grows at 6 cm per day and on 32nd day it would have grown further 60 cm and reached height of 105 cms.

Boat Stream Problems:

99. A group of family members started on a pleasure trip against the current in Cauvery river at 8 am on a day. After travelling 2 Kms the hat fell into river. The boat travelled for further ten minutes and after that the boat returned back. While returning they were able to get the hat back exactly from the same spot they started after rowing along with the current for 10 minutes. What is the speed of the current?

a) 6 km/hr  b)8 km/hr  c) 4 km/hr  d) 10 km/hr

Answer : a) 6 km/hr

Solution :
For such problems, it is better to roughly draft diagrams to arrive at equations essential to solving these. An illustration for this question could be as below :

Let the speed of the boat be B
Let the speed of current be C
Then upward speed = B – C
Downward speed = B + C
From the diagram we can easily say that
d2 = d1 + 2 -> eq 1
\[ d2 = \text{distance covered downstream by travelling for 10 minutes or 1/6 hours = Downward Speed x 1/6 = (B + C) 1/6} \]
\[ d1 = \text{distance covered upstream for 10 minutes or 1/6 hours = Upward Speed x 1/6 = 2 + (B - C) 1/6} \]
Applying the values of $d_1$ and $d_2$ on eq 1 we get

\[
(B + C) \frac{1}{6} = (B - C) \frac{1}{6} + 2
\]

\[
B + C = B - C + 12
\]

\[
B + C - B + C = 12
\]

\[
2C = 12\ .
\]

\[
C = 6 \text{ km/hr}
\]

100. A group of college students started on a boat riding upstream in Ganga river.
After travelling certain distance hat of a girl fell into river. The boat was travelling against the current for further 15 minutes before a student discovered that the hat was missing. Then the boat was driven back and after 15 minutes along with the current drive the hat was taken back. hat was found exactly at the same place they started.
Can you find the distance from start where the hat fell into river if the speed of the current was 8 km/hr.
a) 8 km b) 4 km c) 16 km d) Can't be determined
Answer : b) 4 km

Solution :
This question is similar to previous problem except the fact that you will have to find the spot at which hat fell into river from start. Diagram to solve this could be as below :

Let the speed of the boat be $B$
Let the speed of current be $C$
Then upward speed = $B - C$
Downward speed = $B + C$
From the diagram we can easily say that $d_2 = d_1 + x$. -> eq 1

\[
d_2 = \text{distance travelled downstream for 15 minutes or 1/4 hours} = \text{Downward Speed} \times \frac{1}{4} = (B + C) \frac{1}{4}
\]

\[
d_1 = \text{distance covered upstream for 15 minutes or 1/4 hours} = (B - C) \frac{1}{4}
\]

Substituting the values of $d_1$ and $d_2$ on equation 1 we get

\[
(B + C) \frac{1}{4} = x + (B - C) \frac{1}{4}
\]

Multiply by 4 on both sides

\[
B + C = 4x + B - C
\]

\[
2C = 4x
\]

Or $x = C/2$.
But C is given to be 8 km/hr
Therefore $x = 8/2 = 4$ Km

101. Carryon Swimmers, a company arranged for a trip against the current on the river Godavari in Krishna District, Andhra Pradesh. This boat trip was considered
very enjoyable and more demand was there. One day Surya, his wife and their only daughter rowed against the current. Surya’s hat fell into river at d Km distance from start. Thereafter the boat was driving against the current for further t minutes. However after t minutes, the boat was returned back to original spot and after rowing along with the current for t minutes the hat was recovered. If speed of current is C and speed of Boat is B can you express d as a function of B, C and t ?

a) d = ct/60 b) d = ct/30 c) d = ct/120 d) none of these

Answer : b) d = ct/30

Solution :
Diagram to solve this question could be as below :

![Diagram](image)

Speed of the boat = B
speed of current = C
Then upward speed = B - C
Downward speed = B + C
Based on the diagram

\[ d^2 = d + d_1 \] - eq 1

\[ d_2 = \text{distance travelled downstream for t minutes or t/60 hours = Downward Speed x t/60 = (B + C) t/60} \]

\[ d_1 = \text{distance travelled upstream for t minutes or t/60 hours = Upward Speed x t/60 = (B - C) t/60} \]

Applying the values of d1 and d2 in equation 1 we get

\[ (B + C)t/60 = d + (B - C)t/60 \]

Simplifying

\[ Ct/60 = d - Ct/60 \]

\[ d = Ct/30 \]

102. Ramesh Verma went to picnic with his family. The picnic spot was connected to nearby island, wherein the visitors were taken to the island by motor boat and brought back in stream water. Karthik, Verma’s son insisted for a boat ride to the island. The boatman told them that the speed of the boat in still water is 5 kmph. It takes 9 hours to travel to the island upstream and 3 hours to travel the same distance downstream, back to main land. Ramesh Verma wanted to calculate the velocity of the stream to decide to take the trip or not. Can you guide him to know the velocity of the stream?

(a) 4 kmph (b) 3 kmph (c) 6 kmph (d) 2.5 kmph

Answer : d) 2.5 kmph

Solution:
Before solving the above problem, let us quickly have a look at four familiar formulas concerned with boats and stream problems:

If speed of boat in still water is \( u \) kmph, and the speed of the stream is \( v \) kmph, then

- Speed downstream = \( (u+v) \) kmph \( \ldots(1) \)
- Speed upstream = \( (u-v) \) kmph \( \ldots(2) \)

If speed in downstream is \( a \) kmph and speed in upstream is \( b \) kmph, then

- Speed of boat in still water = \( \frac{1}{2}(a+b) \) \( \ldots(3) \)
- Speed of stream = \( \frac{1}{2}(a-b) \) kmph \( \ldots(4) \)

Let \( x \) be the distance of the spot from the island. Also we know that the time taken during downstream is 9 hours and upstream is 3 hours respectively.

- Downstream speed = \( a = \frac{\text{distance}}{\text{time taken downstream}} = \frac{x}{9} \)
- Upstream speed = \( b = \frac{\text{distance}}{\text{time taken upstream}} = \frac{x}{3} \)

Also we know the still water speed of boat is 5 Km/h.

Applying the above values in formula 3 we get:

\[
5 = \frac{1}{2}(\frac{x}{3} + \frac{x}{9}) = \frac{1}{2}(\frac{4x}{9}) = \frac{4x}{18},
\]

Simplifying we get \( 4x = 5 \times 18 = 90 \)

Or \( x = 90/4 \).

Now applying the values of \( x, a \) and \( b \) in formula 4 we get:

Speed of stream = \( \frac{1}{2} (\frac{90}{12} - \frac{90}{36}) = 180/72 = 2.5 \) kmph

103. Roshan likes travelling in motor boat. He planned a visit by boat to a nearby island. The stream was flowing at 2 km/hr. Roshan travels in a motor boat and goes 10 km upstream and back again to the starting point in 55 minutes. What is the speed of the boat in still water?

(a) 21 kmph (b) 22 kmph (c) 23 kmph (d) 24 kmph

**Answer:** b) 22 kmph

**Solution:**

Let us assume the speed of the boat in still water be \( u \) kmph.

- Upstream speed = \( u + v = u + 2 \) (here \( v \) refers to speed of stream)
- Downstream speed = \( u - v = u - 2 \)

Based on data in question we can easily say that,

- Time taken to travel upstream + Time taken to travel downstream = 55 minutes or \( \frac{55}{60} = \frac{11}{12} \) hours

Or \( \frac{\text{Distance}}{\text{Upstream Speed}} + \frac{\text{Distance}}{\text{Downstream Speed}} = \frac{11}{12} \)

Or \( 10/u+2 +10/u-2 = \frac{11}{12} \)

Simplifying further we get:

\[
10(u-2) + 10(u+2)/(u+2)(u-2) = 11/12
\]

\[
10u-20+10u+20/(u+2)(u-2) = 11/12
\]

\[
20u/(u+2)(u-2) = 11/12. \text{Cross multiplying and equating you get},
\]

\[
240u = 11u^2-44 \quad \text{or} \quad 11u^2-240u-44 = 0
\]

Dividing all terms by 11 we get:

\[
u^2 - \frac{240}{11} u - \frac{44}{11} = 0 \ldots(1)
\]

This is in form of a quadratic equation

\[
u^2 - (\text{sum of the factors})u + (\text{product of the factors}) = 0 \ldots(2)
\]

Once we find the two factors (quadratic equation has two factors) we can write the above equation in the form:

\((u - \text{factor1})(u - \text{factor2}) = 0\)
Comparing 1 and 2, we need to find two numbers such that their sum will be 240/11 and product will be -44/11
22 and -2/11 satisfy our requirement.
Hence \(u^2 - 240/11 \ u - 44/11 = 0\) can be written as
\[(u - 22)(u + 2/11) = 0\]
\[u = 22 \text{ or } u = -2/11\]
Since \(u\) cannot be negative \(u\) should be 22 which is our answer.

104. Johny participated in a swimming competition. He swam in a river at an effective speed of 6 Kilometers/hr. The rate of the stream against Johny is measured to be 3 Kilometers/hr. Now, by how much percentage his effective speed will increase assuming Johny swims in the direction of the stream.
(a) 100% (b) 66 2/3% (c) 50% (d) 72%
Answer : a) 100%

Solution:
Since Johny opposes the stream speed to achieve an effective speed of 6 Km/hr, original physical speed of Johny would be \(6 + 3 = 9\) Kilometers/hr. In downstream, if he swims with his original speed his effective speed will become \(9 + 3 = 12\) Kilometers/hr. This is \(6\) Kilometers/hr more than that of the initial effective speed 6 Kilometers/hr. Hence his speed would increase by
\[
6 / 6 \times 100 = 100\%
\]

105. Final year students (ECE) of Excellent Engineering College wanted to celebrate their placement in a leading IT company on a pay package of Rs.3.6 lakhs per annum. They went to the nearby restaurant. None of them was having a credit card or debit card. When the bill for Rs.2000 came it was seen that two friends had not brought money with them. This resulted in the other members contributing Rs.50 more than what they would have paid if the two friends had brought sufficient money. Find the number of students who went to the restaurant?
(a) 8 b) 10 c) 12 d) 16
Answer : b) 10

Solution:
Let \(P\) be the number of person who went to the restaurant
They have to pay a total of Rs. 2000
Each person should have paid Rs. 2000/P
But two of them could not pay. Hence deficit amount = Amount to be paid by each person x 2 persons = \((2000/P) \times 2 = 4000/P\) ...(1)
The remaining people had to pay extra amount of Rs. 50 each.
Therefore, Extra amount actually paid by remaining people = \((P - 2 \text{ persons}) \times 50\) ...(2)
Above calculated extra amount should be equal to the deficit created when two persons failed to pay. Therefore, values of (1) and (2) should be equal
\[(P - 2) 50 = 4000/P\]
\[P (P-2) = 4000/ 50\]
\[P^2 - 2P = 80\]
\[P^2 - 2P - 80 = 0\]
For Factorizing, think of the two number with a difference of 2 and the product is 80 i.e the number 10 and 8 which satisfies the above condition.

\[ P^2 - 10P + 8P - 80 = 0 \]
\[ P(P - 10) + 8(P - 10) = 0 \]
\[ (P + 8)(P - 10) = 0 \]

Either \( P = -8 \) or \(+10\). But \( P \) cannot be negative because number of students cannot be a negative number.

Therefore, \( P = 10 \)

106. 12 employees of an Information Technology company in Bengaluru wanted to arrange for a pleasure trip to nearby place. Originally the cost of the trip was estimated at Rs. 6000. Few people could not make it up in the last minute so each participating member had to pay Rs. 100 more than the amount they would have paid earlier. How many members went to trip?

a) 10 b) 12 c) 14 d) 16

Answer: a) 10

Solution:
12 People initially planned to go for a trip. Since the total cost was estimated to be 6000, each would had planned to pay Rs. 6000/12 = Rs. 500.

Let number of people who missed to attend the trip be \( M \).

Then deficit amount would had been Number of people who didn't attend \( x \) Amount planned per person = \( M \times 500 = 500M \) ...(1)

Extra amount paid by remaining members = Rs. 100 \( x \) Number of people who attended = 100 \( \times \) (12 - \( M \)) ...(2)

The deficit amount should be equal to the extra amount paid

Therefore, values of (1) and (2) will be same,

i.e 500M = 100(12 - \( M \))
600 \( M \) = 1200
Or \( M = 2 \)

Number of people who went to trip = Total planned members - \( M = 12 - 2 = 10 \)

107. A grand party was arranged for 15 employees of a multi national bank as a mark of finalization of books of accounts as on March 31, 2012. A certain sum of money was estimated for party spend and it was agreed to share the expenses amongst members. But unfortunately three employees could not make it up, others who participated had to pay Rs.300 more than the amount they would have paid if all those agreed attend the party. What was the total amount estimated for party spend?

a. 18000 b. 16000 c. 3600 d. 36000

Answer: a. 18000

Solution:
Let \( A \) be the net amount planned for the party.

Since there were 15 members, initial planned amount per person would be \( A/15 \)

Three employees were unable to attend the party. Hence the deficit in amount would be 3 persons \( X \) amount planned per person = \( 3 \times A/15 = A/5 \) ...(1)

Remaining members paid extra amount of Rs. 300 each to make up for the deficit created.
Hence net extra amount paid would be Number of attending persons X 300 = (15 - 3) X 300 = Rs. 3600 ...(2)
But the deficit amount should be equal to the net extra paid by attending members. Therefore, values of (1) and (2) should be equal, i.e A/5 = 3600 Or A = 18000
Therefore, amount estimated for party spend = Rs. 18000

Arrangement and equation solving questions

108. Arun has certain number of books. It is not less than 15 and not more than 30. If he wants to give these books equally to 2 of his friends, then 1 book will remain. If he wants to give these books equally to 3 of his friends, then 2 books will remain. If he wants to give these books equally to 4 of his friends, then 3 books will remain. What is the number of books he had?
   a) 19 b) 17 c) 29 d) 23
   Answer : d) 23

Solution:
Though there are many ways to solve these problems, the best and fastest approach would be to go by inspecting options one by one. Now let’s get on to the solution:
Let x be the number. Let us take one option at a time and check if the conditions in question are satisfied.
Assume option a) is right :
If x=19, then 19/3 gives the remainder 1. This contradicts the statement that "he wants to give these books equally to 3 of his friends, then 2 books will remain"
Conclusion : Hence option a) is wrong.
Assume option b) is right :
If x=17, then 17/4 gives the remainder 1. This contradicts the statement that "he wants to give these books equally to 4 of his friends, then 3 books will remain"
Conclusion : Hence option b) is wrong.
Assume option c) is right :
If x=29, then 29/4 gives the remainder 1. This contradicts the statement that "he wants to give these books equally to 4 of his friends, then 3 books will remain"
Conclusion : Hence option c) is wrong.
Since we have ruled out first three options, the only possible correct answer would be (d) 23.

109. In a Company, there are certain number of team members and certain number of team leaders. If five team members are assigned to each team leader, then one member is left out without team leader. If six members are assigned to each team leader, then one team leader has no member at all. Find the number of team leaders in that company?
   a) 7 b) 36 c) 5 d) 8
   Answer : a) 7

Solution:
Let the number of team members be x and the number of team leaders be y.
If 5 members are assigned to each team leader, then one member is left.
i.e. \((x-1)/5 = y\)  
\[\Rightarrow x - 5y = 1 \quad \text{(1)}\]

If 6 members are assigned to each team leader, then one team leader is left out  
i.e. \(x/6 = y - 1\)  
\[\Rightarrow x - 6y = -6 \quad \text{(2)}\]

Solving (1) and (2), we get  
\[x = 36 \text{ and } y = 7\]

Hence, there are 7 team leaders in that company.

**110. In a street, there are certain number of houses. People in that street are decided to paint their houses with certain colours. If four houses are painted with each colour, then one house will be left without any colour. If five houses are painted with each colour, then one colour will remain. Find the number of houses in that street?**  
a) 6 b) 36 c) 25 d) 7  
**Answer :** c) 25

**Solution:**  
Let the number of houses in that street be \(x\) and the number of colours be \(y\).  
If 4 houses are painted with each colour, then one house will be left without any colour.  
i.e. \((x-1)/4 = y\)  
\[\Rightarrow x - 4y = 1 \quad \text{(1)}\]

If 5 houses are painted with each colour, then one colour will be left out  
i.e. \(x/5 = y - 1\)  
\[\Rightarrow x - 5y = -5 \quad \text{(2)}\]

Solving (1) and (2), we get  
\[x = 25 \text{ and } y = 6\]

Hence, there are 25 houses in that street.

**111. Six persons namely Raj, Dinesh, Vijay, Aravind, Vivek and Praveen are standing in a queue to get a train ticket in a railway station. Raj is standing between Vivek and Praveen. Praveen is ahead of Dinesh and Vivek is standing behind Aravind. Vijay is standing behind Dinesh. Due to closing time at the ticket counter, they will give tickets only to the first four persons. Who will not get the tickets?**  
a) Dinesh and Vivek b) Praveen and Vivek c) Dinesh and Vijay d) Praveen and Vijay  
**Answer :** c) Dinesh and Vijay

**Solution :**  
Going by the data in the question, the resulting arrangement will be:  
Aravind Vivek Raj Praveen Dinesh Vijay.  
Since the first four person will only get the tickets, Dinesh and Vijay will not get the tickets.

**112. In a conference hall 60 members are seated in a row where women are twice that of men. If Naveen is seated seventeenth from the top and if there are 9 women are seated before Naveen, then how many men are seated after him?**  
a) 12 b) 17 c) 8 d) 9  
**Answer :** a) 12

**Solution :**
Given that number of men = 2 * (number of women)  
Let the number of men be X and the number of women be 2X.  
Then X + 2X = 60  
X = 20  
i.e., Number of men seated = X = 20 and number of women seated = 2X = 40.  
Number of persons seated after Naveen = 60 – 17 = 43 -> eq (1)  
It's given in the question that, Number of women seated before Naveen = 9  
Then, Number of women seated after Naveen = Total number of women - 9 = 40 – 9 = 31 -> eq (2)  
Number of men seated after Naveen = Number of persons seated after Naveen - Number of women seated after Naveen  
From eq (1), Number of persons seated after Naveen = 43 and  
From eq (2), Number of women seated after Naveen = 31  
Therefore Number of men seated after Naveen = 43 – 31 = 12

113. In a one day cricket match between India and Australia, India wins the match due to well played players (Dhoni, Tendulkar, Sehwag, Yuvaraj, Kholi and Raina). Dhoni scored more runs than Raina but not more than Tendulkar. Tendulkar scored less runs than Sehwag and Yuvaraj scored more runs than Sehwag. Kholi scored not more than Raina. Then who will get the man of the match award in that game?  
a) Tendulkar b) Sehwag c) Yuvaraj d) Dhoni  
Answer : c) Yuvaraj

Solution :  
By the given data, the scores of the players are arranged in descending order as follows  
Yuvaraj     Sehwag    Tendulkar    Dhoni   Raina Kholi  
Therefore, Yuvaraj scored more runs when compared to other players.  
So, Yuvaraj will get the man of the match award in that game.

114. Ramesh Rajamanickam and Sucharitha Mohan wanted to buy certain books for their small library. They arranged these books as a pile one over the other. There are 3 computer science books, 3 reasoning books, 2 maths books, 2 interview books and 2 English books. A Computer science book is either at the top most or bottom most level. Starting from the top a reasoning book is between a maths book and computer science book (either of the mentioned Maths or Computer Science books may be at top of reasoning book), an English book is between a maths book and computer science book. A reasoning book is third book from the bottom. An interview book is between a maths book that is at the sixth place from the top and a reasoning book. Another interview book is in between two reasoning books. A computer science book is in between a reasoning and English. Which book is at the fourth place from the bottom?  
a) Computer Science b) English c) Reasoning d) Interview.  
Answer : d) Interview.

Solution :  
It is definitely known that reasoning book is third from the bottom. Hence it has to be at 10th place.  
Maths book is at the 6th place.  
It is given from the top reasoning book is in between computer science and Maths. The top
most book can be computer science or maths. But in another place it is given that computer science book is either at the top most or bottom most. One computer science book is said to be in between reasoning and English books. One more is between maths and English. So one has to be at the top. Hence 1st, 2nd and 3rd places will be occupied by Computer Science, Reasoning and Maths books respectively. It is given English Book is between Maths and Computer Science book from top. Hence the 4th and 5th places have to be occupied by English and Computer Science books respectively.

An interview book is between a maths book that is at the sixth place from the top and a reasoning book and another interview book is in between two reasoning books. This condition is possible if we arrange Interview, Reasoning and another Interview books at 7th, 8th and 9th positions.

A computer science book is in between a reasoning and English. This can be arranged by placing a Computer Science book and English book at 11th and 12th places respectively.

When the books are arranged they will appear as under:

**Top to bottom:**
1) Computer science
2) Reasoning
3) Maths
4) English
5) Computer Science
6) Maths
7) Interview
8) Reasoning
9) Interview
10) Reasoning
11) Computer Science
12) English

Going by this the fourth book from the bottom is an Interview book.

**115. Harish Rawat of Haryana a student studying in MK College of Engineering, Rohtak purchased ten book and arranged them one over the other. There are 3 books of Biology, 3 books of Reasoning, 2 books of Physics and 2 books of Chemistry.**


a) Chemistry  b) Reasoning  c) Physics  d) Biology

**Answer:** b) Reasoning.

There are ten books. The important point to note is that the mentioning of 'Taking from above, in order' prior to question statements. This makes your life much easier when it comes to arranging.

Now let's start arranging from top in order based on the statements given. There is a Chemistry book between Biology and Physics book. This means Biology, Chemistry and Physics books have to occupy 1st, 2nd and 3rd places from top.
Second statement states that there is a Biology book between a Physics and an Chemistry book. This means a Biology book has to occupy 4th place and a chemistry book has to occupy 5th place. (By this Biology book will lie between Physics book at 3rd place and Chemistry book at 5th place)

Then comes the third statement which states that a Reasoning book lies between Chemistry and a Physics book. This implies a Reasoning book has to occupy 6th place and a physics book has to occupy 7th place. (By this Reasoning book at 6th place lies between Chemistry book at 5th place and a Physics book at 7th place)

Fourth statement says a physics book exists between two reasoning books. This means 8th place is to be occupied by a Reasoning book so that the physics book lies between a Reasoning book at 6th and another reasoning book at 8th place.

Last statement says there are two reasoning books in between a Physics and a Biology book. This means 9th place has to be occupied by a Reasoning and 10th place has to be occupied by a Biology book. By this Two reasoning books at 8th and 9th places will lie between a Physics book at 7th place and a Biology book at 10th place.

Going by information provided when books are arranged. They will appear in this order from the top to bottom.

1 Biology  
2 Chemistry  
3 Physics  
4 Biology  
5 --  
6 Reasoning  
7 Physics  
8 Reasoning  
9 Reasoning  
10 Biology

Going from the top Chemistry book is between Biology and Physics—Chemistry will appear in the second place from the top. A biology book is between Physics and chemistry – so Biology will appear in the fourth from top.

Reasoning book is between from Chemistry and Physics and hence reasoning will appear in the sixth place from the top. This is sufficient to answer the question – viz. fifth book from the bottom.

Arrangement of other books will appear as given above.

Ratio and Proportion

116. Sharmila Begum, a tea merchant has two varieties of tea one costing Rs.62 per kg. and the other costing Rs.72 per kg. In what ratio she should mix these two varieties such that the mixture is worth Rs.64.50 per kg.

a) 3:1 b) 2:1 c)1:3 d)none of these.

Answer : a) 3 : 1

Solution :

Let us assume that the ratio of new mixture be a : b so that the new price becomes Rs. C. (in our case X = 64.5). Let us assume C1 be the cost per Kg of I variety of tea and C2 be the cost per Kg of the II variety. (In this problem, C1 = 62 and C2 = 72)

Then we have, a.C1 + b.C2 / (a + b) = C
Substituting $C_1 = 62$, $C_2 = 72$ and $C = 64.5$, we get

$$\frac{62a + 72b}{a + b} = 64.5 \quad \text{---- eq 1}$$

Now let us substitute the value of options one by one in this equation to check which one satisfies this equation.

Option I : $a = 3$, $b = 1$
Substitute $a, b$ values in eq 1 we get,

$$\frac{62 \times 3 + 72 \times 1}{3 + 1} = 64.5$$
Or $258 = 258$
Thus, option I satisfies the equation and hence it is the correct answer.

117. Vinayaga Sait & son are the leading sugar dealers in Kolkata, a place known for milk sweets. Vinayaga Sait wanted to know how many kilogram of sugar costing Rs.18 per kg can be mixed with 27 kg of sugar costing Rs. 14 per kg such that there may be a gain of 10% on selling the mixture at Rs.18.48 per kg.?
a) 63 kg b)72 kg c)81 kg d) none of these.
Answer : a) 63 kg.

Solution :
Selling price of 1 kg of mixture = Rs. 18.48 at 10% profit
Cost price of 1kg of mixture = $\frac{100}{110} \times 18.48 = Rs.16.80$
Take a look at the solution for previous question. We are again going to use the familiar equation

$$a.C_1 + b.C_2 / (a + b) = C \quad \text{- eq 1}$$

Here, $C = 16.8$, $C_1 = 18$, $C_2 = 14$.

Also, $a/b = \text{Weight of I variety of Sugar/ Weight of II variety of sugar}$
$a/b = x/27$, where $x = \text{weight of I variety of Sugar}$
Substituting values, eq 1 becomes,

$$18a + 14b = 16.8(a + b)$$
Divide by $b$ on both sides

$$18a/b + 14 = 16.8(a/b + 1)$$
But $a/b = x/27$
Therefore, $18x/27 + 14 = 16.8(x/27 + 1)$
Multiply by 27 on both sides,

$$18x + 378 = 16.8(x + 27)$$
$$18x - 16.8x = 453.6 - 378$$
$$1.2x = 75.6$$
$$x = 75.6/1.2 = 63 \text{ Kg}$$

118. Karimlal Sait is running a famous rice shop and he consults his Manager to find out that in what ratio must rice at Rs.9.30 per kg be mixed with rice at Rs.10.80 per kg so that the mixture be worth Rs.10 per kg?
a. 7 : 8 b. 8 : 7 c. 31 : 36 d. 36 : 31
Answer : b) 8 : 7

Solution :
This question is very similar to the first question.
Let us again use our familiar equation : $a.C_1 + b.C_2 / (a + b) = C \quad \text{- eq 1}$$
Values as given in question values are $C_1 = 9.30$, $C_2 = 10.80$, $C = 10$. 

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Substituting above values in eq 1 we get,
9.3a + 10.8b = 10(a + b) -> eq 2
Consider Option I where a = 7 and b = 8.
Substituting these values in eq 2 we get
9.3 x 7 + 10.8 x 8 = 10 (7 + 8)
151.5 != 150.
Hence, option I does not satisfy equation no 2. Hence option I is not correct.
Consider Option II where a = 8 and b = 7
Substituting these values in eq 2 we get
9.3 x 8 + 10.8 x 7 = 10 (8 + 7)
150 = 150
Option II satisfies the equation no 2 perfectly and hence it is the right answer.

Average Problems:

119. A group of students from Netherlands visited Chennai to study about the various aspects of life prevalent in Chennai. They also studied about the weather forecasts. The average temperature of days from Sunday to Wednesday was 36 degrees and that of from Monday to Thursday was 33.5 degrees, The temperature on Thursday was 2/3 of Sunday. What was the temperature on Sunday?
a) 20 b) 30 c) 40 d) 38
Answer : b) 30 degrees
Solution :
Average Temperature from Sunday to Wednesday - 36.
Total temperature from Sunday to Wednesday - 36 x 4 = 144 deg.
Average temperature from Monday to Thursday – 33.5 deg.
Total temperature from Monday to Thursday - 33.5 x 4 = 134
If the total temperature from Monday to Wednesday be K
Then, Sunday’s temperature + K = 144 -> eq 1
Thursday’s temperature + K = 134 -> eq 2
It is stated that Thursday temperature was 2/3 of Sunday. Applying this to eq 2, we get :
2/3 (Sunday’s Temperature) + K = 134 -> eq 3
Eq 1 – Eq 3 => 1/3 (Sunday’s Temperature) = 10. Therefore, Sunday temperature = 30 deg.

120. A prominent School in Chennai had classes from LKG to XII standard. A study was made about the marks scored by students of XII in a government examination. The average marks of 60 students in a class was 45. The average marks of the boys in the class is 40 and the average marks of the girls in the class is 50. What is the ratio between the number of boys and girls in the class?
a) 1 : 1 b) 2 : 1 c) 3 : 1 d) none of these.
Answer : a) 1 : 1
Solution :
Total marks of 60 students = 60 x 45 = 2700
Suppose number of girls = x
Number of boys = (60 - x)
Number of girls X average marks of girls + Number of boys x average marks of boys = 2700
\[ x \times 50 + (60 - x) \times 40 = 2700 \\
50x + 2400 - 40x = 2700 \\
By simplifying we get \( x = 30 \). Number of boys = 30. Number of girls = \( 60 - x = 60 - 30 = 30 \)
Therefore ratio of number of boys to girls = \( 30 / 30 = 1 \)

121. The average number of visitors to a museum from Wednesday to Saturday was 2345. Average number of visitors to it from Thursday to next Sunday was 2100. If the number of visitors to the museum on Sunday was 1820, find the number of visitors to the museum on Wednesday.

a) 2700 b) 2900 c) 2400 d) 2800

**Answer :** d) 2800.

Solution:
The average no. of visitors from Wednesday to Saturday = 2345
Total number of visitors from Wednesday to Saturday = 2345 \times 4 = 9380
Average number of visitors from Thursday to Sunday = 2100
Total number of visitors from Thursday to Sunday = 2100 \times 4 = 8400
Number of visitors on Sunday = 1820.
So number of visitors from Thursday to Saturday = 8400 - 1820 = 6580
But it is given that, Number of visitors from Wednesday to Saturday = 9380
Therefore, Number of visitors on Wednesday = 9380 - 6580 = 2800

122. A prominent School at Siliguri had three batches of students numbering 35, 40 and 50 respectively. The average marks of these batches is 40, 45 and 55 respectively. What is the average mark of all the three batches students put together?

a) 48.6 b) 49.6 c) 51 d) 47.6

**Answer :** d) 47.6

Solution:
Total marks of all 3 batches = Number of students in I batch \times Average of I batch + Number of students in II batch \times Average of I batch + Number of students in III batch \times Average of I batch = \[(35 \times 40) + (40 \times 45) + (50 \times 55)\]
Total number of students in all III batches = 35 + 40 + 50 = 125
Average marks of all students of III batches = Total marks of all 3 batches / Total number of students.
= \[(35 \times 40) + (40 \times 45) + (50 \times 55)\] divided by 125 = 47.6

Cube Problems:

123. Ramesh brought a 9 cm cube painted on all its sides (outside) with red paint and showed it to Suresh. Suresh was happy on seeing the cube. The cube was divided into small cubes of 1 cm each. Ramesh posed the following questions to Suresh and Suresh was perplexed to get the answers.

1) How many small cubes of 1 cm size will be there?
A) 343 B) 216 C) 729 D) 512

**Answer :** C) 729
Formula = \( n^3 = 93 = 729 \) (Number of cubes of 1 cm is same as the volume of the cube in cubic cm)

124) How many small cubes of 1 cm size will have only two surfaces painted?
A) 48 B) 84 c) 84 d) none of these
Answer : B) 84

125. Formula - Blocks painted on 2 surfaces - 12(n -2)
12(9-2) = 12 x 7 = 84

126. How many small cubes of 1 cm size will have one surface painted?
a) 324 b) 484 c) 516 d) 294
Answer : d) 294
Formula - Blocks painted on one surface only - 6 \((n - 2)^2\)
= 6 \((9 - 2)^2\) = 6 x 72 = 294

127. How many small cubes will have all its surfaces unpainted?
a) 216 b) 125 c) 343 d) none of these
Answer : c) 343
Formula - Blocks unpainted on all sides - \((n - 2)^3\)
(9-2)^3 = 343

128. How many small cubes will have their three sides painted?
a) 16 b) 12 c) 8 d) 24
Answer : c) 8
Formula small cubes painted on 3 surfaces – it is always 8.(Small cubes at the edge on top four and at bottom four.)

129. A cube of 6 cm size was brought in. It was cut into small cubes of 1 cm each. What is the percentage increase in the surface area after such cutting?
A) 400% B) 300% C) 200% D) 500%
Answer : D) 500%
Solution :
Volume of 6 cm cube = 216 cc. When it is cut into 1 cm cube, the volume of each of the cubes = 1cc
Hence, there will be 216 such cubes. Surface area of small cubes = 6 (12) = 6 sqcm.
Therefore, the surface area of 64 such cubes = 216 * 6 = 1296 sqcm.
The surface area of the large cube = 6(6^2) = 6*36 = 216.
% increase = \( \frac{1296 - 216}{216} \times 100 = 500\% \)

Work Distance and Time:

130. Panchapakesan and his wife Swarnamalya are harvesting apples. Panchapakesan can pluck one apple in 15 minutes and Swarnamalya can pluck one apple in 12
minutes. Their daughter Rupasri takes 20 minutes to eat an apple and she eats all day. How many apples will they be able to sell to the market, if they work from 6 am to 6 p.m.?
a)24 b)30 c)36 d)42
Answer : c) 36

Solution:
Panchapakesan plucks 4 and his wife plucks 5 per hour. In one hour they can pluck 9. In Twelve hours they will pluck 108. Their daughter eats 3 per hour. Hence throughout the day she will eat —72. (While the plucking is done for 12 hours by the couple, their daughter eats for 24 hours at the rate of 3 per hour) Then balance would be 108 - 72 = 36. Hence they would be taking 36 apples to market.

131. Twenty two Australians and 16 Russians can complete a piece of work in 10 days, whereas 22 British and 6 Russians can complete the same work in 12 days. In how many days will one Australian, working along with one Russian and 1 British can complete the work?
a)120 days b) 40 days c)60 days d) 30 days
Answer : a) 120 days

Solution:
Let Au denote work done by 1 Australian in 1 day.
Let Ru denote work done by 1 Russian in 1 day
Let Br denote work done by 1 British in 1 day.
As per question, 22 Australians and 16 Russians can complete work in 10 days. Therefore in one day, they will complete 1/10th of work. Putting this in equation, we get :
22 Au + 16 Ru = 1/10
Similarly : 22 Br + 6 Ru = 1/12
Adding the above two equations, 22 Au + 22 Br + 22 ru = 1/10 + 1/12 = 22/120
or Au + Br + Ru = 1/120
That is, 1 Australian , 1 British and 1 Russian can complete 1/120th of work in 1 day. Hence they can complete the entire work in 120 days.

132. Prabhudeva, his wife and their son went to Express Plaza in Chennai. Prabhudeva’s wife fears walking along with the escalator. All the three got onto an escalator going up. Prabhudeva reached the top in 30 seconds taking 5 steps, but the son reached 6 seconds ahead of Prabhudeva. Prabhudeva’s wife did not take any step of her own and reached the top 6 seconds after Prabhudeva. Find out a) the number of steps taken by the son, b) the distance between the two points and c) the speed of the escalator.
a) 10, 30, 5/6 b) 12, 24, 5/6 c) 18, 24, 4/5 d) none of these.
Answer : a) 10, 30, 5/6

Solution:
Let E be the speed of the escalator in steps per second, S the number of steps climbed by the son and N the number of steps between the two points (start and end). Prabhadeva takes 30 second to reach the top and during this time he climbs 5 steps and the escalator moved by 30 E steps. So the total number of steps is (5 + 30 E)
Thus, \( N = 5 + 30E \) .....(1)
Applying the same logic for the son \( N = S + 24E \) ....(2)
Since Prabhudeva’s wife does not take any steps of her own,
\( N = 36E \) ....(3)
From (2) and (3) \( S = 12E \)
Substitute \( N = 5 + 30E \) in eqn 2,
\( 5 + 30E = S + 24E \)
\( S = 6E + 5 \)
Substituting \( S \) value we get,
\( 12E = 6E + 5 \)
\( 6E = 5 \)
\( E = 5/6 \)
\( S = 5/6 \times 12 = 10 \)
\( N = 30 \times 5/6 + 5 = 30 \)

Logical Question:

133. A marketing company devised a methodology of spreading its message through one another. One person can tell it to 3 persons in 4 minutes and these three persons tell the other three persons each in further 4 minutes and the process continues so on. How many minutes will it take to spread the message to 2187 persons.

a) 48 minutes b) 24 minutes c) 32 minutes d) 28 minutes

Answer : d) 28 minutes.

Solution :
3 persons are told in 4 minutes
9 persons are told in 8 minutes
27 persons are told in 12 minutes
81 persons are told in 16 minutes
243 persons are told in 20 minutes
729 persons are told in 24 minutes.
2187 persons are told in 28 minutes.

134. A secret can be told to only 2 persons in 3 minutes. Each person in turn tells 2 other persons in the next minutes and the process continues accordingly. In 30 minutes how many persons can be told this secret in this way?

a) 1024 b) 2048 c) 512 d) 4096

Answer : a) 1024

Solution :
In three minutes the secret is told to -- 2 persons
In six minutes (from start) the secret is told to - 4 persons
In nine minutes (from start) the secret is told to - 8 persons
In 12 minutes the secret is told to - 16 persons
In 15 minutes - 32 persons
18 minutes - 64 persons
21 minutes - 128 persons
24 minutes - 256 persons
27 minutes - 512 person
30 minutes - 1024 persons

135. A multi level marketing devised a training program by which a trainer could convince 40 persons every 60 minutes he conducts the program. And in the next 60 minutes those each of those 40 persons will convince 40 persons. If this process is repeated how many people can be trained/convinced by the company in 300 minutes?
a) 2560000 b) 102400000 c) 64000 d) 5120000
Answer : b) 102400000

Solution :
One trainer convinces/trains in 60 minutes - 40 people
120 minutes - 40 x 40 = 1600
180 minutes - 1600 x 40 = 64000
240 minutes - 64000 x 40 = 2560000
300 minutes - 2560000 x 40 = 102400000 people

Number System

136. Find the remainder when $6^{23}$ is divided by 5 ?
a. 2 b. 4 c. 1 d. 3
Answer : c. 1
Solution :
$6^2 = 36$ which has 6 in unit digit again.
$6^3 = 216$ which has 6 in unit digit again.
Similarly for any higher powers, the unit digit will be 6 always.
Hence, $6^{23}$ will have 6 in unit's digit as well.
Any number with 6 in unit's digit will understandably give a remainder 1 when divided by 5. Hence 1 is the answer.

137. The difference between $3/5$ of $2/3$ of a number and $2/5$ of $1/4$ of the same number is 288. What is the number?
a) 960 b) 850 c) 895 d) 955
Answer : a) 960
Solution :
Let the number be N
According to the question, $(3/5 \times 2/3 \times N) - (2/5 \times 1/4 \times N) = 288$
$2/5 \times N - 1/10 \times N = 288$
$4 \times N - N = 2880$
$N = 2880/3 = 960$

138. What is the number that should come in the place of question mark?
1050 420 168 67.2 ?
a) 29.88 b) 10.752 c) 4.3008 d) 26.88
Answer : d) 26.88
Solution :
In the given sequence, you can easily find that every term is obtained from its predecessor by dividing it by 2.5 as given below.

1050 divided by 2.5 = 420
420 divided by 2.5 = 168
168 divided by 2.5 = 67.2
67.2 divided by 2.5 = 26.88
Hence the answer is 26.88

**139.** \(25^{3.7} \times 5^{4.2} \div 5^{6.4} = 25^?\)

a) 1.7 b) 3.2 c) 1.6 d) 3.6

**Answer : c) 1.6**

Solution:

\((5^3)^{2.7} \times 5^{4.2} \div 5^{6.4} = (5^2)^?\)

\((5^{3.4} \times 5^{4.2}) / 5^{6.4} = (5^2)^?\)

\(5^{3.2} = (5^2)^?\)

\(2? = 3.2\)

\(? = 3.2 / 2 = 1.6\)

**140.** When a number is divided by 138 the remainder is 26. What will be the remainder if the same number is divided by 23?

a) 1 b) 3 c) 2 d) 4

**Answer : b) 3**

Solution:

138 is a multiple of 23. (23 x 6 = 138).
So when the number is divided by 23 the remainder will be 26-23 = 3.

**141.** Mr. Mukhambo has two numbers and say that their difference, their sum and their product are to one another as 1:7:24. Mukhambo wants to find out whether you can get him the product of those two numbers:

a) 24 b) 6 c) 48 d) 12

**Answer : c) 48**

Solution:

Difference between the two numbers ratio wise is 1
Sum of the two numbers ratio wise is 7
Products of the two numbers ratio wise is 24.

i.e 1:7:24

Choice b) and d) cannot be the answer because product has to be ratio wise 24.
It is case a) or c)

For product to be 24 it has to be 4 and 6. But their sum is 10 and difference is 6
So 2:10:24 simplifying also it comes 1:5:12. This cannot be the answer.
For product to be 48 – numbers can be 6 and 8.
Sum – 14

Numerical and Algebraic Questions:
142. The average of seven consecutive even numbers \( P, Q, R, S, T, U, V \) is 64. What is the product of \( P \) and \( V \)?
   a) 4060  b) 3860  c) 4260  d) 4440
   **Answer :** a) 4060.

   **Reason :**
   In case the average of the given seven consecutive numbers is 64, logically it should be equal to the number exactly equidistant from both ends which is \( S \).
   (For example consider 2, 4, 6, 8, 10, 12, 14. In this case average is \( \frac{2+4+6+8+10+12+14}{7} = \frac{56}{7} = 8 \). This is nothing but the middle number 8 which is fourth in position from both the ends. Note: This method of finding average can be applied to any consecutive even number series when the number of terms is an odd number.)
   Therefore \( S = 64 \).
   If \( S \) is 64, then \( P \) must be 58 and \( V \) is 70. Product of 58 and 70 is 4060.

143. If the numerator of a fraction is increased by 200\% and the denominator is increased by 250\% the resultant fraction is \( \frac{3}{14} \). What is the original fraction?
   a) \( \frac{1}{2} \)  b) \( \frac{3}{4} \)  c) \( \frac{1}{4} \)  d) \( \frac{1}{8} \)
   **Answer :** c) \( \frac{1}{4} \)

   **Reason :**
   Let \( P \) and \( Q \) be the original numerator and denominator respectively.
   \( P \) when increased by 200\% becomes, \( P + P(200/100) = \frac{300P}{100} \)
   \( Q \) when increased by 250\% becomes, \( Q + Q(250/100) = \frac{350Q}{100} \)
   According to the question, \( \frac{300P}{100} / \frac{350Q}{100} = \frac{3}{14} \)
   Or \( \frac{300P}{350Q} = \frac{3}{14} \)
   Or \( \frac{P}{Q} = \frac{3}{14} \times \frac{350}{300} = \frac{25}{100} = \frac{1}{4} \)

144. How many number in between 1 and 100 are there each of which is not only exactly divisible by 4 but does not have 4 as a digit?
   a) 18  b) 17  c) 7  d) 20
   **Answer :** b) 17.

   **Reason :**
   100 divided by 4 will give us 25. This not only means 4 times 25 is 100, but also means that there can be 25 numbers divisible by 4 from 1 to 100. Since the question is about numbers in between 1 and 100, 100 is to be excluded. So we have 24 numbers falling between 1 and 100 divisible by four. The question is the number should be divisible by 4 but it should not have 4 as a digit. Numbers fulfilling this condition are:
   8, 12, 16, 20, 28, 31, 36, 52, 56, 60, 68, 72, 76, 80, 88, 92, 96.

145. If the remainder obtained by subtracting a number from its own square is 6 times the number, what is the number?
   a) 4  b) 3  c) 6  d) 7
   **Answer :** d) 7

   **Reason :**
   This is a very simple question. Solution is as follows.
   Remainder obtained by subtracting the number from its own square is 6 times the number.
That means $X^2 - X = 6X$
$X^2 = 7X.$
$X = 7$

146. Three-fourth of a number is equal to 60% of another number and the difference between the two numbers is 20. What is the sum of the two numbers?
a) 220  b) 180  c) 170  d) 320
Answer : b) 180.

Solution :
This is another simple question dealing with algebraic equations. Solution is as follows.
Let the numbers be $X$ and $Y$.
$3/4X = 60/100Y = 3/5Y$
$3/5Y = 3/4X$
$12Y = 15X$
$12Y - 15X = 0 ---- (i)$
But from the question, $Y - X = 20$. Multiplying LHS and RHS by 12 we get,
$12Y - 12X = 240 ---- (ii)$
Simplifying both the equations, $12Y - 15X - 12Y + 12X = 0 - 240$
$-3X = -240$
$X = 80$ & $Y = 80 + 20 = 100$
Sum of the two numbers = $80 + 100 = 180$

Logical Sequencing:

147. Find the missing number
3,8,_,38
If $n$ is a given number in the series, the next number is $2n + 2$
Hence third number is $2 * 8 + 2 = 18$

148. Find the missing number
2,5,10,17,_
$n$th number in the above sequence is $n^2 + 1$
Hence 5th number is $5^2 + 1 = 26$

149. Find the missing number
4,7,13,21,_
Here $7 = 4 + 3$
$13 = 7 + 6$
$21 = 13 + 9$
Hence next number = $21 + 12 = 33$

150. Find the missing number
3,5,9,17,_
Here $5 = 3 + 2$
$9 = 5 + 2 \text{ power } 2$
$17 = 9 + 2 \text{ power } 3$
Hence next number = $17 + 2 \text{ power } 4 = 33$
151. Find the missing number
2, 6, 10, 18, _
Here if \( a = 2 \), then the series is
\[ a, a + a^2, a + a^3, a + a^4 \]
Then the next number is \( a + a^5 \)
= 34

152. Find the next pair in the sequence - AB CA FB JA
Options: 1) OB 2) OC 3) NA 4) NB
Answer 1
Answer is option 1) OB.
Reason.
Consider the first terms of the sequence A, C, F, J... Here C is one next A, F is two next C, J is three next F and so on. Hence next alphabet would be O (which is four next J). Consider second terms B, A, B, A... Hence this is an alternating sequence of Bs and As. Hence next alphabet would be B.
Based on the above two statements, the answer is OB.

153. Find the next pair of alphabets in the sequence - AB EC ID OE
Options: 1) LF 2) UF 3) UG 4) LE
Answer 2
Answer is option 2) UF.
Reason.
Consider the first terms of the sequence A, E, I, O... Have you seen this somewhere? :). Yes, this is our good old sequence of vowels. Hence next vowel would be U.
Consider second terms B, C, D, E... This is a plain sequence of alphabets in order. Hence next one would be F. Combining above two statements answer is UF.

154. (Easy Question) Find the next alphabet in the sequence... A, Z, B, Y, _, X ?
Options: 1) D 2) C 3) F 4) G
Answer 3
You would had already guessed. Yes, it is option 2) C.
Reason
Consider the second, fourth and last alphabets. They are Z, Y and X which are the last three alphabets. Similarly consider the first and third terms - A and B. These are the first two alphabets. Hence logically the blank should be occupied by C which is the third alphabet from the start.

Aptitude Question:

155. Sum of square of three numbers is 95 and the product of these numbers is 101. Find the numbers.
Answer:

This is a tricky question which might consume a lot of time if not read carefully. In the above question, 101 is a prime number which cannot exist as a product of three different
numbers. Hence you should immediately tick the option "none of the above" when reading these kinds of questions.

156. Find the total number of distinct vehicle numbers that can be formed using two letters followed by two numbers. Letters need to be distinct.

Answer:

This question comes under permutations and combinations section. Out of 26 alphabets two distinct letters can be chosen in \(26p2\) ways. Coming to numbers part, there are 10 ways (any number from 0 to 9 can be chosen) to choose the first digit and similarly another 10 ways to choose the second digit. Hence there are totally \(10 \times 10 = 100\) ways. Combined with letters there are \(6p2 \times 100\) ways = 65000 ways to choose vehicle numbers.

157. Consider the sum of first 70 natural numbers. If every digit '6' is replaced by '8' what would be the net increase and the new sum?

Answer:

To answer this question, you need to know the simple formula for sum of first 'n' natural numbers which is \(n(n+1)/2\).

Hence sum of numbers from 1 to 70 would be \(70 \times 71/2 = 2485\).

If every '6' digit is replaced by '8' there would be totally 8 replacements at \((6,16,26,36,46,56,60,66)\). Every replacement will add an additional '2' to the net sum. Hence the new sum will be \(2485 + 8 \times 2 = 2501\) and the increase will be 16.

158. Consider the sum of first 100 odd numbers. If every digit 7 is replaced by 2 what would be net decrease in sum and the new sum?

This question is for you to try to solve yourselves.

156. A leather box contains 8 black balls and 6 white balls. Two draws of three balls each are made, the balls being replaced after the first draw. What is the probability that the balls were black in the first draw and white in the second draw?

\(\text{a)}\ 70/8281 \ \text{b)}140/20449 \ \text{c)} 25/5445 \ \text{d)}35/5448 \ \text{Answer : a)}70/8281

Solution:

Total number of balls = 8 + 6 = 14
Total ways of drawing 3 balls, \(N(S) = 14C3 = 364\)
No of ways to draw 3 black balls = \(N(E1)\) for black balls = \(8C3 = 56\)
Probability of all balls being black = \(P(E1) = N(E1) / N(S) = 56/ 364 = 14/91\)
No of ways to draw 3 white balls = \(N(E2)\) for white balls = \(6C3 = 20\)
Probability of all balls being white = \(P(E2) = 20 / 364 = 5/91\)
Probability of drawing 3 black balls in first draw and drawing 3 white balls in the second draw = \(P(E1) \times P(E2)\)
Therefore \(P(E) = 14/91 \times 5/91 = 70 /8281\)

159. Fourteen persons are sitting around a circular table facing the centre. What is the probability that three particular persons sit together?

\(\text{a)}\ 2/9 \ \text{b)}1/13 \ \text{c)2/13} \ \text{d)1/26 \ \text{Answer : d)}\ 1/26\)
Solution:
In a circle of \( n \) different persons, the total number of arrangements possible = \((n - 1)!\)
Total number of arrangements = \(n(S) = (14 - 1)! = 13!\)
Taking three persons as a unit, total persons = 12 (in 4 units)
Therefore no. of ways for these 12 persons to around the circular table = \((12 - 1)! = 11!\)
In any given unit, 3 particular person can sit in 3!.
Hence total number of ways that any three person can sit =
\(n(E) = 11! \times 3!\)
Therefore \(P(E) = \text{probability of three persons sitting together} = \frac{n(E)}{n(S)} = \frac{11! \times 3!}{13!}\)
divided by 13!
\(3 \times 2\) divided by 13 x 12 = 1/26

160. In how many different ways can the letter of the word “ECHRONICLLEE” be arranged?
a)1663200 b)8316000 c)3326400 d)4158000
Answer : c)3326400

Solution:
ECHRONICLLEE has 11 letters
Total number of rearrangements = \((\text{Number of letters})! / (\text{Number of 1st repetitive letter})! x (\text{Number of 2nd repetitive letter})!\)....
In the word ECHRONICLLEE, E occurs thrice. C occurs twice. Hence denominator of the above formula will become 3! x 2!
Therefore Total number of rearrangements = \(11! / 3! 2!\)
= 3326400

161. A box contains 4 blue and 5 white balls and another box contains 5 blue and 4 white balls. One ball is to be drawn from either of the two boxes. What is the probability of drawing a blue ball?
a) 2/9 b) 1/9 c) 4/9 d) 1/2
Answer : d) 1/2
Solution :
Probability of choosing first box = 1/2 and
Probability of choosing second box = 1/2
Imagine there is no second box at all :
P1 = Probability of choosing one blue ball from first box when there is no second box at all
= No of ways of choosing 1 blue ball from among 4 blue balls / Total number of ways of choosing 1 ball from all 9 balls.
= \(4C_1 / 9C_1\)
Imagine there is no first box at all :
P2 = Probability of choosing one blue ball from second box when there is no first box at all
= No of ways of choosing 1 blue ball from among 5 blue balls / Total number of ways of choosing 1 ball from all 9 balls.
= \(5C_1 / 9C_1\)
Now, consider our real scenario of having both the boxes :
P3 = Probability of choosing one blue ball from the first box = P1 x Probability of choosing first box = \(4C_1 / 9C_1 \times 1 / 2 = 2/9\)
Similarly probability of choosing one blue ball from the second box = \( P_2 \times \) Probability of choosing second box = \( \frac{5C_1}{9C_1} \times \frac{1}{2} = \frac{5}{18} \)

\[ P(E) = \text{Probability of choosing a blue ball from either of the boxes} = P_3 + P_4 = \frac{2}{9} + \frac{5}{18} = \frac{1}{2} \quad \text{--eq 1} \]

Note: Since the question reads we have to choose one blue ball from first OR second box we have used ‘+’ sign in eq 1. If the question were choosing one blue ball from first AND second box, we should had used multiplication i.e ‘x’.

162. An urn contains 6 red, 4 blue, 2 green and 3 yellow marbles. If four marbles are picked at random, what is the probability that at least one is blue?

a) 4/15 b) 69/91 c) 11/15 d) 22/91

Answer : b) 69/91

Solution:
Total possible outcomes = \( n(S) \)
= Selection of 4 marbles out of 15 marbles
= \( 15C_4 = (15 \times 14 \times 13 \times 12) \div (1 \times 2 \times 3 \times 4) = 1365 \)

When no marble is blue, favourable number of cases \( n(E) \)
= Selection of 4 marbles out of 11 marbles
= \( 11C_4 = 11 \times 10 \times 9 \times 8 \div (1 \times 2 \times 3 \times 4) = 330 \)

Probability that atleast one ball is blue + Probability that no ball is blue = 1
Therefore, Probability that atleast one ball is blue = 1 - Probability that no ball is blue
Therefore, Probability that atleast one ball is blue = \( 1 - n(E) / n(S) \)
= \( 1 - 330/1365 = 1 - 22/91 = 69/91 \)

163. A committee of 4 members is to be selected from a group of 4 women and 3 men. What is the probability that the committee has at least one man.?

a) 1/35 b) 3/7 c) 34/35 d) 4/7

Answer : c) 34/35

Solution:
Probability of there being all women in the committee = \( 4C_4 \) divided by \( 7C_4 = 1/35 \)

But, Probability of there being all women in the committee + Probability of there being at least one man = Probability of formation of a committee with no restriction of gender = 1
Probability of there being at least one man = 1 - 1/35 = 34/35

164. If a shopkeeper accidentally sells a pen at double its actual selling price, his profit increases 4 fold. Then he realizes his mistake and sells other pens at their original selling price. Find his actual profit percentage.

Answer 1

let the original selling price be \( sp \) and the cost price be \( cp \).
If he sells the pen at double the selling price, his new profit will be \( 2sp - cp \).
His actual profit should had been \( (sp - cp) \). But his accidental rising of the selling price resulted in a four fold increase of the original profit which is \( 4 \times (sp - cp) \).
Hence, \( 2sp - cp = 4 \times (sp - cp) \)
Therefore \( sp = (3/2)cp \).
Actual profit percentage = \( (sp - cp)/cp \% = 50\% \)
165. Consider three brothers Ram, Ravi and Rahul. Consider Ram to be taller than Ravi by 10% and Rahul is taller than Ravi by 30%. Now, by how much percentage Rahul is taller than Ram.

**Answer 2**

Let heights of Ram, Ravi and Rahul be p, q and r respectively. Then as per the conditions given in the question:

- \( p = \frac{110}{100}r \)
- \( q = \frac{130}{100}r \)

Ratios of heights of q and r will be \( \frac{130/100r}{110/100r} = \frac{13}{11} \).

Hence Rahul will be \( \frac{13}{11} \) % taller than that of Ram.

166. John swims in a river at an effective speed of 8 Kilometers/hr. The velocity of the stream against John is measured to be 2 Kilometers/hr. Now, how much his effective speed will increase when he swims in the direction of the stream.

**Answer 3**

Since John opposes the stream speed to achieve an effective speed of 8 Km/hr, original physical speed of John would be \( 8 + 2 = 10 \) Kilometers/hr. In downstream, if he swims with his original speed his effective speed will become \( 10 + 2 = 12 \) Kilometers/hr. This is 4 Kilometers/hr more than that of the initial effective speed 8 Kilometers/hr. Hence his speed would increase by \( \frac{4}{8} \% = 50\% \).

167. 3 blocks are chosen randomly on a chessboard. What is the probability that they are in the same diagonal?

**Answer**

There are total of 64 blocks on a chessboard. So 3 blocks can be chosen out of 64 in \( \binom{64}{3} \) ways.

So the sample space is \( = 41664 \)

There are 2 diagonal on chessboard each one having 8 blocks. Consider one of them.

3 blocks out of 8 blocks in diagonal can be chosen in \( \binom{8}{3} \) ways.

But there are 2 such diagonals, hence favourables \( = 2 * \binom{8}{3} = 2 * 56 = 112 \)

The require probability is \( \frac{112}{41664} \)

\( = \frac{1}{372} \)

\( = 0.002688 \)

168. What is the area of the triangle ABC with A(e,p) B(2e,3p) and C(3e,5p)? where \( p = \pi \) (3.141592654)

**Answer**

A tricky ONE.

Given 3 points are colinear. Hence, it is a straight line.

Hence area of triangle is 0.
169. Silu and Meenu were walking on the road. Silu said, "I weigh 51 Kgs. How much do you weigh?" Meenu replied that she wouldn't reveal her weight directly as she is overweight. But she said, "I weigh 29 Kgs plus half of my weight." How much does Meenu weigh?

**Answer**

Meenu weighs 58 Kgs.

It is given that Meenu weighs 29 Kgs plus half of her own weight. It means that 29 Kgs is the other half. So she weighs 58 Kgs.

Solving mathematically, let's assume that her weight is $X$ Kgs.

\[ X = 29 + \frac{X}{2} \]
\[ 2X = 58 + X \]
\[ X = 58 \text{ Kgs} \]

170. Consider the sum: $ABC + DEF + GHI = JJJ$. If different letters represent different digits, and there are no leading zeros, what does $J$ represent?

**Answer**

The value of $J$ must be 9. Since there are no leading zeros, $J$ must be 7, 8, or 9. ($JJJ = ABC + DEF + GHI = 14? + 25? + 36? = 7??$)

Now, the remainder left after dividing any number by 9 is the same as the remainder left after dividing the sum of the digits of that number by 9. Also, note that $0 + 1 + \ldots + 9$ has a remainder of 0 after dividing by 9 and $JJJ$ has a remainder of 0, 3, or 6. The number 9 is the only number from 7, 8 and 9 that leaves a remainder of 0, 3, or 6 if you remove it from the sum $0 + 1 + \ldots + 9$. Hence, it follows that $J$ must be 9.

171. Which of the following numbers is divisible by 4?

a) 1123346  
b) 10224  
c) 100234

**Answer is 10224**

172. At 15:15 pm railway time, what will be the angle between minute and hour hand?

a) 0 degree  
b) 180 degrees  
c) 360 degrees  
d) both a and c

**Answer is both a and c**

173. Let Raj be 3 years older than Ravi and Hema be two years younger than Ravi. Raj is three times as old as Rahul who is Hema's brother. The ratio of the ages of Hema and Her brother is 3:2. Find by how much percentage Raj's age is more than Hema's when Raj will be 20 years old.

a) 33.33  
b) 40  
c) 60

**Answer is 33.33**
174. A hat vendor bought hats at Rs 5 per 3 hats. He sold them at Rs 10 per 4 hats. What was his profit percentage?

a) 25  
b) 50  
c) 30  

**Answer is 50**

175. A 20 litre solution contains oil and kerosene in the ratio 3:5, replace 4 litres of mixture with 4 litres of kerosene what will be the ratio of oil and kerosene?

When 4 liters are taken out of 20ml, amount of oil in remaining 16 lt = 3/8 * 16 = 6
Hence the remaining 10 litres would be kerosene
Now additional 4 litres of kerosene is added to the solution
So total quantity of kerosene = 14 litres
Ratio of oil:kerosene = 6/14 = 3/7

176. Find the value of (999 - 1)(999 - 2)........(999 - n). Where maximum number of digits in n is 4

Answer zero.

When n = 999, the entire product becomes zero

177. In a classroom the average height of all the boys was 170 cm. Rahim recently joined the class which originally had 20 boys increased the average to 171 cm. Then find the height of Rahim.

Before Rahim joined the total height of all the boys = 170 X 20 = 3400.
New average = (Total height of all students + height of rahim)/21 = 180
Therefore (3400 + height of rahim)/21 = 171
Therefore height of Rahim = 3780 - 3400 = 191 cms.

178. Find the sum of all terms in the series 1, 1/2, 1/4 ..... 

This is a GP with a = 1, and r = 1/2.
Since r < 1 this is an infinite geometric series. Hence sum of all terms = a/(1 - r) = 1/(1 - 1/2) = 2

179. Fieasta Fountain Square is one of the largest housing projects in Bangalore. It has over 300 flats, a swimming pool, play area, community hall, walking lawns etc. In one of the blocks named Arjun, there are two water tanks A and B. A is much smaller than B. Water fills at the rate of one litre every hour in A. At the end of first hour tank B gets filled with 10 litres of water. At the end of second hour the capacity raises to 20 litres and so on. If 1/16th of the total capacity of tank B is filled after 24 hours, what is the total time required for tank B to get completely filled?
(a) 26 hours (b) 27 hours (c) 29 hours (d) 28 hours

**Answer : d) 28 hours**
Solution:
Though two tanks namely A and B are discussed, the question relates to Tank B only. Hence any data about Tank A can be ignored.
Based on data given, the capacity of tank B that is getting filled is doubled compared to the previous hour.
1/16 of the tank gets filled in 24 hours. Therefore double of 1/16 i.e 2(1/16) or 1/8th of the tank will be filled in 25 hours.
Similarly 1/4th of the tank will get filled in 26 hours.
1/2th of the tank will get filled in 27 hours
Finally the full capacity will be reached in 28 hours.

180. Arunodaya Enclave has 20 flats. Water from three different sources are fed into the cistern.
Three taps can fill the cistern in 10mins, 15mins and 18mins respectively. The cistern being empty, all the three taps are kept open by the watchman of the enclave. After 3mins, the watchman closes the third tap. After third tap is closed, how many minutes would be required by the first two taps to fill the cistern completely.
(a)1 min (b) 2 min (c) 3 min (d) 4 min
Answer : b) 2 min

Solution:
In 1 minute the first tap can fill 1/10th of the cistern
In 1 minute the second tap can fill 1/15th of the cistern
In 1 minute the third tap can fill 1/18th of the cistern
Therefore, the capacity that can be filled by all the three taps simultaneously in 1 minute = 1/10 + 1/15 + 1/18 = 2/9th of the total capacity of cistern
For 3 minutes, the capacity filled by three taps operating simultaneously = 3 x 2/9 = 2/3rd of the total capacity.
At the end of the 3rd minute, 3rd tap is closed.
Remaining capacity that is to be filled by the first and second taps alone = 1 - 2/3 = 1/3rd of the total capacity.
The capacity that can be filled by first two taps simultaneously in 1 minute = 1/10 + 1/15 = 5/30 = 1/6th of the total capacity.
Capacity Filled    Time Required
1/6               1 minute
1/3               ?
1/3rd capacity of the cistern (remaining capacity after third tap is closed) can be filled by first two taps in 1/3/1/6 = 2 minutes.
So option (b) is correct.

181. Srivari Riveria is a big housing complex in Coimbatore. Gaint tanks are placed in every complex building to cater to the needs of the residents. In a block named Annapurna, three taps P, Q and R can fill a tank in 12, 15 and 30 hours respectively. The caretaker of the complex has instructions to keep tap P open all the time and Q and R are to be opened for one hour alternately. When will the tank in Annapurna become full?
a) 5 hrs b) 6 hrs c) 7 hrs d) 8 hrs
Answer : c) 7 hrs
Solution:
In 1 hour P can fill 1/12th of the tank
In 1 hour Q can fill 1/15th of the tank
In 1 hour R can fill 1/30th of the tank
For the first two hours P is kept open for the entire duration of 2 hours while Q and R are opened for 1 hour each.
Therefore, capacity that will be filled in 2 hours by all the pipes = Capacity filled by first pipe in 2 hours + Capacity filled by second tap in 1 hour + Capacity filled by third tap in 1 hour
= 2(1/12) + 1/15 + 1/30
= 1/6 +1/15+1/30 = 4/15th of the tank.
The process is repeated and hence in 6 hours (3 x 2 hours), 4/15x3 = 4/5th of the tank will be filled. In the seventh hour, the remaining 1/5th of the tank will be filled. The entire tank thus will be full in 7 hours.

182. An Air France jet flight from the City of Chicago to Bentenwel started its journey at 9.00AM from Chicago domestic air port. Another flight Airway International started from Chicago to Bentenwel at 10.00AM (exactly one hour later), Airway International was within the minimum separation distance, following Air France jet at 12.00 noon. What is the average speed of Air France jet?
(a)740 kmph (b) 450kmph (c) 370 kmph (d) 430 kmph
Answer : c) 370 kmph

Solution:
Let us use the basic formula Distance = time x rate.
Assume the speed of Air France be X kmph. Air France has travelled for three hours till 12 PM when both the flights are at minimum separation. Similarly until minimum separation distance, Rate and time taken by Airway International are 555 kmph and 2 hours.
(Note: Minimum separation does not mean both the planes are on same air route. They could be in parallel routes. Since no further details are given on air routes by the planes, the only way to solve is to assume that the distance travelled by both planes during minimum separation is same.)
Based on above note, we can equate the distance travelled by Air France in 3 hours to that of Airway International in 2 hours.
3 * X = 555 x 2 or
3X = 1110 and
X = 370 kmph.

183. The famous Denali Star train starts from Anchorage and travels towards Fair Banks at a speed of 50 mph. After some time, another train Glacier Discovery starts (from a parallel track to the Denali Star train) at Fair Banks and moves towards Anchorage at a speed of 70 mph. Both the trains Denali Star and Glacier Discovery have a length of 1/6 miles each. After the trains meet, how many seconds will the faster train take to overtake the slower one?
(a) 60 seconds (b) 20 seconds (c) 180 seconds (d) 32 seconds
Answer : a) 60 seconds

Solution:
Relative speed of faster train with respect to that of slower train = 70 - 50 = 20 mph
After the trains meet the faster train has to cross the entire length of the slower train as well as its own length to overtake the slower train.
Distance to be covered by faster train while overtaking = 1/6 + 1/6 = 1/3 miles
Time taken for overtake = Distance to be covered / Relative speed = 1/3 / 20 = 1/60 hours
Since all the options are given in units of seconds, we can calculate the equivalent number of seconds for 1/60 hours as below:

<table>
<thead>
<tr>
<th>hour</th>
<th>seconds</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>3600</td>
</tr>
<tr>
<td>1/60</td>
<td>?</td>
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</tbody>
</table>

3600/60 = 60 seconds

184. The Coramandal Express leaves Chennai Central at 7.30 AM and reaches Howrah 6.00AM the next day. Between Chennai and Howrah, there are 15 halts and the total time the train stopped is 90 minutes. If the distance between Chennai and Howrah is 1400 km
What is the average speed of Coramandal Express?
(a) 66kmph (b) 72 kmph (c) 70 kmph (d) 88 kmph
Answer : c) 70 kmph
Solution:
Total Time taken by Coramandal Express = 22 1/2 hours (from 7.30AM of the day to 6.00am of next day).
To calculate actual running time of the train, we have to deduct the time consumed in 15 halts i.e we have to deduct 90 minutes.
Therefore, Total running time = 22 1/2 - 1 1/2 = 20 hours.
Distance between the two cities is given as 1400 km. Speed of Coramandal Express can be found by applying the simple formula,
Speed = Distance / time
Substituting distance and running time values in the above formula we get,
Speed = 1400 / 20 = 70 kmph.

185. Kishen Raj got an increase of 50% of the amount he invested in Simple Interest in 5 years. What will be his return on 100000/- at compound interest after 2 years at the same rate?
(a) 21000 (b)21600 (c)32100 (d) 31200
Answer : a) 21000
Solution:
Let us assume Kishen Raj had invested Rs. 100/- in Simple Interest. As per the question data, the amount would increase by 50% in 5 years.
i.e His amount would had increased to 100 x 150/100 = Rs. 150
Net interest for 5 years = Increased amount after 5 Years - original amount invested
= 150 - 100 = Rs. 50
Therefore, SI per year = 50/5 = Rs. 10. Since the amount invested was Rs. 100, simple interest rate will be 10%. (because 10% of Rs. 100 is Rs. 10)
Mr. Kishen wants to invest 100000/- in CI at 10% for 2 years.
Compound Interest = Amount(1 + Rate/100)\text{^number of years} - Amount
=100000(1+10/100)^2-100000
Mr. Kishen will get a return of 21000 in 2 years.

**186.** Magnificent Bank is offering an investing scheme where investment will be compounded at 8% per annum for 2 years. Fantastics bank promised exactly same return on invested amount but was offering a simple interest scheme. Can you tell what was the equivalent SI rate that was offered by fantastic bank?
(a) 9.02% (b) 8.56% (c) 8.32% (d) 8.88%
**Answer:** c) 8.32%

**Solution:**
Let us assume Rs. 100 is invested in Magnificent Bank. At 8% compound interest for 2 years, the amount will grow to
\[100 \times (1 + \frac{8}{100})^2 = 116.64\]
Net interest = 116.64 - 100 = Rs. 16.64
If same interest of Rs. 16.64 has to be given by Fantastic Bank on same amount invested (in our example, Rs.100) for 2 years, then per year return has to be \[\frac{16.64}{2} = Rs. 8.32\] This interest is on Rs. 100. Therefore SI rate will be 8.32%

**187.** Priya was to celebrate her daughter’s birth day. This time it was a prestige issue to her, as only last month her neighbour celebrated her son’s birthday in a grand fashion. She borrowed two loans at simple interest, one for Rs.15000 at 4% per annum and the other for Rs.14000 at 5% per annum for the same period. She paid Rs.7800 as total interest. What is the period for which she borrowed the money.
(a) 3 years (b) 6 years (c) 3 ½ years (d) 6 ½ years
**Answer:** b) 6 years

**Solution:**
Let us recall the formula for calculating Simple Interest.
\[SI = \frac{PNR}{100}, \text{where } P=\text{Principal, } N=\text{period and } R=\text{rate of interest.}\]
So, interest payable by Priya for one year on both borrowings is, \[15000 \times 1 \times 4 / 100 = 600 \text{ and } 14000 \times 1 \times 5 / 100 = 700.\] Total interest for one year comes to 600 + 700 = 1300. Since she paid total interest of 7800, the period for which she borrowed money comes to 7800/1300 = 6 years.

**188.** Vijay, was constructing his new house. He wanted to install two pipes which can fill his overhead tank in 36 min. and 45 min. respectively. He also planned for an outlet pipe which can empty the tank in 30 min. While doing the first test run of the pipes, he opened the first two pipes. After 7 minutes, he opened the third pipe. In how much time the tank will be full?
(a) 35 min (b) 52 min (c) 46 min (d) 48 min
**Answer:** c) 46 min

**Solution:**
I pipe can fill the tank in 36 min.
In 1 min I pipe can fill 1/36 part of tank.
II pile can fill the tank in 45 min.
In 1 min II pipe can fill 1/45 part of tank.
Outlet pipe can empty the tank in 30 min.
In 1 min the outlet pipe can empty 1/30 part of tank.
Part filled in 7 min when first two pipes were opened together = 7[1/36 + 1/45] = 7/20
Remaining part of tank = [1 - 7/20] = 13/20
Net part filled in 1 min when all the three pipes are opened together
= [1/36 + 1/45 - 1/30] = 1/60
Therefore 1/60 part is filled in 1 min when all the three pipes are opened together
13/20 part is filled in [60x13/20] = 39 min
Total time taken to fill the tank = first 7 minutes of running pipes I and II + 39 minutes of running all pipes together
= 46

189. Mohan constructed a reservoir tank for water in his house. The two pipes he installed can fill reservoir tank in 10min & 12min respectively. He also constructed a waste pipe in the bottom which can drain off 5 litres of water per min. Mohan wanted to test the capacity of his new tank. If the reservoir is empty and all the pipes are opened it is filled in 7½ mins. What is the capacity of the reservoir tank?
(a)100 lit (b)200 lit (c)300lit (d)400 lit
Answer : a)100 lit

Solution:
Applying the time and work principle, the two pipes can fill in one minute 1/10 + 1/12 = 11/60th capacity of the tank. The drain pipe can empty in x minutes (let us assume) the tank. Therefore in one minute, 1/x capacity of tank will get drained.
When all the pipes are opened together, amount of tank filled in 1 minute = 11/60 - 1/x ...(1)
It is given in question that if all the three pipes are open, tank will be filled in 7 1/2 minutes or 15/2. In other words when all pipes are opened together, part of tank filled in 1 minute = 2/15 ...(2)
Equating 1 and 2 we get
11/60 - 1/x = 2/15
1/x = 11/60 - 2/15 = 11-8/60 = 3/60 = 1/20
Or x = 20 minutes.
According to question, the drain pipe can drain in one minute 5 litres of water as given in the problem. Also we have found that the drain pipe can empty the entire tank in x minutes i.e 20 minutes. In other words, number of litres that can be emptied by drain pipe in 20 minutes will be the capacity of the tank.

<table>
<thead>
<tr>
<th>Litres Emptied</th>
<th>Minutes</th>
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<tr>
<td>5</td>
<td>1</td>
</tr>
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<td>?</td>
<td>20</td>
</tr>
</tbody>
</table>

So the capacity of the reservoir tank constructed by Mohan will be 5x20 =100 litres.

190. 3 taps named Ganga, Jamuna and Kavery were installed in the posh Iswarya Roy Apartments in Guntur to cater to the needs of residents of the said apartment building. Ganga, Jamuna and Kavery can fill a giant tank in the apartments in 12, 15 & 20 hours respectively. If Ganga is open all the time and Jamuna and Kavery are open for one-hour each alternatively, then in how many hours the giant tank will be full?
a)7 hrs b)8 hrs c) 9 hrs d) 10hrs
Answer : a)7 hrs
Solution:
It is given that tap Ganga is open always and the other two taps Jamuna and Kavery are open for one hour each alternatively.
During first hour Ganga and Jamuna will be open and second hour Ganga and Kavery will be open. The process get repeated.

**First hour:**
Ganga in one hour will fill 1/12 th capacity of tank and Jamuna will fill 1/15 th capacity of tank.
Together in one hour they will fill \(1/12 + 1/15 = 9/60\) or \(3/20\) capacity of tank. ...(eq A)

**Second hour:**
Ganga in one hour will fill 1/12 th capacity of tank and Kavery will fill 1/20 th capacity of tank.
Together in one hour they will fill \(1/12 + 1/20 = 8/60\) or \(2/15\) capacity of tank....(eq B)
In two hours \(9/60 + 8/60 = 17/60\) capacity of tank will be filled. In 6 hours (3 times 2 hours each) \(3 \times 17/60 = 51/60\) capacity of tank will be filled. Remaining capacity = 1 - \(51/60 = 9/60 = 3/20\)
In the 7 th hour, the remaining 9/60 or 3/20 capacity of tank will get filled. (refer eq A)

191. Mumbai Rajadhani express left Delhi for Mumbai at 09.30 hrs, travelling at a speed of 60 kmph and Delhi Super Fast Express left Delhi for Mumbai on the same day at 11.30 hrs. travelling at a speed of 80 kmph. How far away from Delhi will the two trains meet ?
(a) 120 km   (b) 360 km   (c) 480 km   (d) 500 km
**Answer : c) 480 km**

**Solution:**
Let us assume both the trains meet at x hours after 9.30 hours.
Then distance travelled by train travelling at 60Kmph for x hours should match the distance covered by train travelling at 80Kmph for x - 2 hours. (x - 2 hours is used for second train as it has started late by two hours.)
Applying the above logic we can form the equation :
\[60x = 80(x - 2)\]
Simplifying we get, \(x = 8\)
So Required distance = \(60x = (60 \times 8) = 480\) km.
Both the trains meet 480 km from Delhi.

192. Virendar travels by a train that leaves New Delhi, at 9.00 AM . The rate of the train was 30 km/hr. Virendar's friend Shilaja leaves by another train that leaves Delhi at 40 km/hr at 2p.m. in the same direction. Shilaja could not get her ticket for the first train. How many kms from Delhi do they meet?
a)437 kms  b)450kms  c)550 kms  d)600 kms
**Answer : d)600 kms**

**Solution:**
Rate of Virendar’s train is 30 kmph. It starts at 9 am while Shilaja's train starts 5 hours late at 2 pm. Before Shilaja's train starts, Virendar's train would have travelled 30 Km/h X 5 hours = 150 km.
Since Virendar’s train and Shilaja’s train travels in the same direction, relative velocity of Shilaja's Train with respect to Virendar's Train = Shilaja's Train Speed - Virendar's Train Speed = 40-30 =10 kmph
193. Christiana drives 150 km from Chennai to Sreekalahasti in 3 hours 20 min to meet her uncle who is a business man there and returns to Chennai in 4 hours 10 min. What is the difference in average speed from Chennai to Sreekalahasti to that of the average speed for the entire trip?

(a) 5 km/hr  (b) 4.5 km/hr  (c) 4 km/hr  (d) 2.5 km/hr

**Answer:** a) 5 km/hr

**Solution:**

Average speed from Chennai to Sreekalahasti = \(\frac{150}{\frac{3}{4}}\) miles/hour = 45 mph ...(1)

Average speed from Sreekalahasti to Chennai = \(\frac{150}{\frac{4}{6}}\) miles/hour = 36 mph ...(2)

Average speed for the entire trip can be calculated using the formula : \(\frac{2xy}{x+y}\)

In this formula, \(x\) represents the onward average speed from Chennai to Sreekalahasti while \(y\) represents return average speed from Sreekalahasti to Chennai.

Applying the calculated values from 1 and 2 in the formula we get :

\[2\times45\times36/ 45+36 = 40 \text{ kmph}\]

The difference between average speed from Chennai to Sreekalahasti to that of the average speed for the entire trip is 45 - 40 = 5 kmph.

194. Garden City Express, a super fast train that flies between Bangalore and Mysore. The average speed of Garden City Express was measured every 12 minutes and was found to have increased by 6 miles per hour during each successive 12 minutes interval. By half way through, assuming there were 5 intervals of 12 minutes, between Bangalore and Mysore the average speed was 60 miles per hour. How many miles did the super fast train travel in the first 12 minute interval?

(a) 7.2 miles (b) 12 miles (c) 10 miles (d) 2 miles.

**Answer:** a) 7.2 miles

**Solution:**

We need to find the distance travelled by the super fast train in the first 12 minutes interval. We know, Distance = Rate \times Time, and we already know the time is 12 minutes. All we need to do is to find the train’s speed (its rate) during the first interval in order to find the distance.

We are given that the train’s average speed increased by 6 miles per hour during each interval. During half way the average speed was 60 miles per hour. There were 5 intervals of 12 minutes. So, in the fourth interval the speed would be 60-6=54. Similarly, in the third interval it would be 54-6=48, in the second interval it would be 48-6=42 and in the first interval the speed must have been 42-6=36 miles per hour.

Now we have time (12 minutes) and speed (36 miles per hour). Since time is in minutes and speed is in units of miles per hour we need to convert the time to hours or the speed to miles per minute (to bring uniformity in units). An hour has 60 minutes so 12 minutes is 12/60
hours = 1/5 of an hour. Therefore the distance is 1/5 hours × 36 miles per hour = 36/5 = 7.2 miles.

195. There is a garden square in shape with its sides measuring 17 m. A cow aged 3 years old is tied to one of the corners of this square garden with a rope of 14 m. In this garden grass is available in plenty and the cow wanted to graze as much as possible. What is the area of this garden which the cow can graze comfortably?
   a) 123 sq. m b) 154 sq. m c) 194 sq.m d) 204 sq.m.
   **Answer:** b) 154 sq.m

**Solution:**
Imagine the square garden – with sides measuring 17 m.

![Diagram](image)

In one of its corners, this is cow tied with a rope of 14 m.
Normally when a cow is tied to a place with the rope it can graze in a full circle space.
Here since it has been tied to a corner of the square the cow can graze ¼ of circle space coverable with the rope tied.
Area of circle = \( \frac{22}{7} \times r \times r \) where \( r \) is the radius of the circle.
Here the radius is 14 m.
So area where cow can graze = Area of circle / 4 = \( \frac{(22/7 \times 14 \times 14)}{4} \) = 154 sq.m
**NOTE:** Some of us may be tempted to calculate taking circumference of circle in mind i.e. 2 × 22/7 × r. The cow can graze not only the outer area but also inside the quadrant (quarter circle)

196. Two goats are tied in the diagonally opposite corners of a square graze yard of size 54 m with two ropes of 21 m length. What is the area of the graze yard that can be grazed by the two goats put together?
   a) 693 sq. m b) 346 ½ sq.m c) 1386 sq.m d) none of these.
   **Answer:** a) 693 sq.m.

**Solution:**
Think of the square ground with side at 54 m.

\[ \text{In the problem it is given one goat is tied to a corner of square ground with rope of } 21 \text{ m length. In the same way another goat is tied to the diagonally opposite corner with another rope of } 21 \text{ m length.}
\]
Area of circle = \( \frac{22}{7} \times r \times r \) where \( r \) is the radius.
In the case of a goat tied to a corner of a ground, it can graze \( \frac{1}{4} \) of the circle that can be made with the length of the rope tied. (quadrant)
In this problem two goats are tied at two diagonally opposite corners of the ground with ropes of 21 m each. So these two can graze area of circle \( \frac{1}{2} \)
\[ \frac{22}{7} \times 21 \times 21 \] = 693 sq.m

197. Bengaluru city has an excellent small garden rectangle in shape with its length measuring 283 m and breadth 150 m in Malleswaram area. An owner of a goat brought his goat and tied it at a corner of the garden with a rope of 112 m length. He wanted his goat to graze all that area that can be covered by it with the rope tied. Please ascertain and tell him the area of garden which his goat will not be able to graze?
a) 38956 sq.m. b) 35896 sq.m. c) 36598 sq.m. d) 32594 sq.m
Answer: d) 32594 sq.m.

Solution:
Though the question says the garden is rectangular, still the graze area would be a quarter of a circle as can be seen from the figure below.
In that the goat is tied in one corner of the ground with a rope of 112 m
Area of land the goat can graze = \((22/7 \times r \times r)/4\) where \(r\) is the length of the rope.
So, \((22/7 \times 112 \times 112)/4 = 9856\) sq. m ...(1)
But the question is on the area that goat cannot graze at all.
Area where goat cannot reach = Area of rectangle - Graze area = Length x Breadth - Graze Area
Apply length = 283 m and breadth = 150 m. Also we know graze area = 9856 sq. m from (1)
Therefore area that cannot be reached by goat = 283 x 150 - 9856 = 42450 - 9856 = 32594

198. Hyderabad Chennai Express started from Hyderabad at 6 am. Chennai Hyderabad Express also started from Chennai at the same time. The first train was travelling at 40 km per hour and the second train was running at 55 km per hour. When the two trains met the first train had travelled 105 km less than the second train. What is the distance between Hyderabad and Chennai.
a) 665 km b) 705 km c) 725 km d) 740 km
**Answer**: a) 665 km

**Solution**:
Let both the trains meet after \(t\) hours since start.
Distance covered by I train in \(t\) hours = speed \(\times\) time = 40\(t\)
Distance covered by II train in \(t\) hours = speed \(\times\) time = 55\(t\)
When the trains cross each other the difference in distance is 105 Km (as given),
Therefore 55\(t\) - 40\(t\) = 105

\(15t = 105\)
or \(t = 7\) hour ie the trains would cross each other in 7 hours.
In 7 hours, First train would had run -- 40 \(\times\) 7 = 280 km
In 7 hours, the Second train would had covered -- 55 \(\times\) 7 = 385 km
Distance between Hyderabad and Chennai = Sum of distances covered by both the trains in 7 hours = 280 + 385 = 665 km.
199. Two Express trains – one from Mumbai to Bengaluru and another from Bengaluru to Mumbai started at the same time viz. 8 am. The first train was running at a speed of 60 km/hour and the second train was travelling faster than first train. Two trains cross each other at 7 hours from the start. If the distance between Bengaluru and Mumbai is 980 km, find the speed of the second train?

a) 80 kmph b) 90 kmph c) 70 kmph d) Can't be determined

**Answer**: a) 80 kmph

**Solution**:

In 7 hours the trains cross each other.

In 7 hours I train would had covered a distance of speed x time = 60 * 7 = 420 km

Let the speed of second train be \( s \)

In 7 hours, II train would had covered \( 7s \) km.

Distance between Bengaluru and Mumbai = 980 Km = Sum of the distances covered by both the trains

\[
i.e \quad 420 + 7s = 980
\]

\[
7s = 560
\]

\[
s = 80 \text{ kmph}
\]

200. Mumbai Chennai Express (Train A) and Chennai Mumbai Express (Train B) started from Mumbai and Chennai stations respectively at 8 am. Train A was running at 65 km per hour and Train B was running at a greater speed than train A. Two trains meet each other after 9 hours. How you can express speed of Train B as a function of distance \( D \) between Mumbai and Chennai?

a) \( (D - 585/9) \) b) \( (D - 585) / 9 \) c) \( (D + 585) / 9 \) d) can't be determined

**Answer**: b) \( (D - 585) / 9 \)

**Solution**:

Trains cross each other after 9 hours.

Distance covered by Train A in 9 hours = 65 * 9 = 585

Let speed of train B be \( s \)

Distance covered by Train B in 9 hours = 9s

Let the distance between Mumbai and Chennai be \( D \).

Distance between Mumbai and Chennai = \( D \) = Sum of distances covered by the trains in 9 hours

\[
D = 585 + 9s
\]

Or \( s = (D - 585) / 9 \)
201. Look at the diagram given.

![Diagram](image1)

XY = XZ = ZY = 14 m. (where XYZ form an equilateral triangle). Given AX = XB = BZ = ZC = CY = YA = 7 m. What is the area common to all the circles and the triangle?

a) 77 sq. m  b) 38 sq. m  c) 144 sq. m  d) 102 sq.m

Answer: 77 sq. m

Solution:
When the side of the equilateral triangle is double the radius of the circles, all circles touch each other and in such cases area common to circles and the triangle = \( \frac{22}{7} \times \text{radius}^2 / 2 \) = \( \frac{22}{7} \times 7 \times 7 \) / 2 = 77 sq. m.

202.

![Diagram](image2)

In the diagram given XY = XZ = ZY = 84 m. AY = AX = XB = BZ = ZC = CY = 42 m.
Calculate the area of the shaded portion inside the triangle not covered by the three circles.

a) 283.33 sq.m  b) 362.33 sq.m  c) 184.66 sq.m  d) none of these.

Answer: a) 283.33 sq.m

Solution:
Area of the equilateral triangle = \( \sqrt{3} / 4 \times \text{SIDE}^2 = \sqrt{3} / 4 \times 84 \times 84 = 3055.33 \) sq.m ...(1)
In this case the side of equilateral triangle is double the radius of the circles, all circles touch each other and in such cases area common to circles and the triangle = \( (22/7 \times 42 \times 42) / 2 = 2772 \) sq.m ...(2)
Area of shaded portion inside the triangle can be obtained subtracting value of 2 from 1 as
below:

3055.33 - 2772 = 283.33 sq.m

203.

There is a right angled triangle ABC. AB = 30 m, BC = 40 m and AC = 50 m. Three circles are drawn with centres as vertices of the triangle. The radius of all the three circles is 14 m (i.e. AD = BE = GC = GF = 14 m). Calculate the area common to the circles and the triangle.

a) 268 sq.m b) 388 sq.m c) 308 sq.m d) 402 sq.m

Answer: c) 308 sq.m.

Solution:
If sum of the internal angles of a triangle is 180 degree, area covered by the three circles will be half of area of a circle with the given radius.
Here the radius of each of the circles is given as 14 m. Therefore area common to circles and triangle = \(\frac{(22/7 \times \text{Radius}^2)}{2} = \frac{(22/7 \times 14 \times 14)}{2} = 308\) sq.m.

204. M/s. Expert Real Estate while selling their land – rectangular in shape -- one side was taken 10% in excess. The other side was taken 20% in deficit. Evaluate the error percentage in this way of calculation?

a) Deficit 20% b) deficit 12% c) deficit 30% d) plus 14%

Answer: b) deficit 12%

Solution:
Let x and y be the sides of the rectangle. Then correct area = xy
While calculating, the length was excessive by 10%. Therefore measured length = 110x / 100 %
While calculating, the breadth was taken 20% deficit. Therefore measured breadth = 80y / 100 %
Now calculated area = measured length x measured breadth = \(\frac{110}{100} \times x \times \frac{80}{100} \times y = \frac{44}{50} xy\)
Error in measurement = actual area - calculated area = \(xy - \frac{44}{50} xy = \frac{6}{50} xy\)
Error percentage = Error in measurement / actual area x 100% = \(\frac{6}{50} \times xy \times \frac{1}{xy} \times 100% = 12\) % deficit
205. Kamalesh Sircar bought a real estate land circular in shape with a radius of 140 m. After three years he was able to acquire land adjacent to it and now the radius of his circular land became 210 m. What is the percentage increase in area of his real estate land?

a) 225% b) 25% c) 125% d) none of these.

**Answer :** c) 125%

**Solution :**

Area of circular land = \( \frac{22}{7} R^2 \) (R is the radius of the circle)

Area of land initially == \( \frac{22}{7} \times 140 \times 140 = 61600 \)

Area of land after acquiring additional land = \( \frac{22}{7} \times 210 \times 210 = 138600 \)

Increase in area = 138600 - 61600 = 77000

Percentage increase in area = Increase in area / Original Area before acquiring x 100% = \( \frac{77000}{61600} \times 100\% = 125\% \)

206. The area of base of a parallelogram was increased by 15% and its height reduced by 5%. What is the increase/decrease in percentage of area of parallelogram?

a) 9.25% deficit b) 15% deficit c) 15% increase d) 9.25% increase

**Answer :** d) 9.25 % increase

**Solution :**

Area of parallelogram = Base X Height

Let the initial measurements be B and H. Area = BH

Breadth got increased by 15%. Therefore new breadth = \( \frac{115}{100}B = 1.15B \)

Height got reduced by 5%. Therefore new height = \( \frac{95}{100}H = .95H \)

Area of the parallelogram after the breadth got increased and height got reduced = \( 1.15 \times 0.95 \times BH = 1.0925BH \)

Increase in area = New area - Original area = \( 1.0925BH - BH = 0.0925BH \)

Percentage increase = Increase in Area / Original Area x 100% = \( \frac{0.0925BH}{BH} \times 100\% = 9.25\% \) increase.

207. A train from Bangalore started at 5.00 am and reached Chennai at 10.00 am. A Second passenger train started from Chennai at 6.00 am and reached Bangalore at 11.00 am. At what time these two trains would have met each other?

a) 8 am b) 9 am c) 7 am d) none of these.

**Answer :** a) 8 am

**Solution :**

Both the trains cover the distance in 5 hours.

**Note :** For such campaigns where distance is not given, it is safe to assume distance between the travel points. For example in this problem we are going to assume the distance to be 300 Km. While assuming distance, please take care that the distance when divided by time/times of travel is a whole number. This will make the calculations easier. Let us assume the distance is 300 km. Then speed will be 60 km per hour (we got this by calculating distance/time = 300/5) for both the trains.
Let the two trains meet $Y$ hours after the second train leaves Chennai. Then first train would had taken $Y + 1$ hours to meet second train as it has started at 5 am which is 1 hour earlier than the second train which started at 6 am.

During the moment when the trains cross each other, we can easily say that

Distance travelled by second train in $Y$ hours + Distance travelled by first train in $Y + 1$ hours = 300

$60Y + 60(Y+1) = 300$  
$120Y + 60 = 300$  
$120 Y = 300-60 = 240$. $Y = 2$ hours

Trains will meet 2 hours after 6 am i.e 8 am.

208. Amritsar Express left Agra at 6 am and reached Amritsar at 3 pm. Agra Express left Amritsar at 7 am and reached Agra at 3 pm. Approximately at what time the two trains will meet?

a) 10.45 am b) 9.45 am c) 8.45 am d) none of these.

Answer : a) 10.45 am

Solution :

Note: Though this problem looks very similar to I problem here there is a minor difference. The travel durations of the I and II trains are not same. Yes, Amritsar Express covers the distance in 9 hours while Agra Express covers the distance in 8 hours.

Hence, while assuming distance it is safe to assume a number that is divisible by both 8 and 9. 720 seems a good bet.

Based on above argument, Let us take the distance between the two places to be 720 km.

Let the two trains meet $x$ hours after the departure of Agra Express.

Speed of Amritsar express will be 80 km/hour  
Speed of Agra Express will be 90 km/hour

At the moment when trains cross each other, we can use the below equation (similar to the one used in first problem) :

Distance covered by Agra Express in $x$ hours + Distance covered by Amritsar Express in $x + 1$ hours = 720 (720 is our assumed distance between Agra and Amritsar)

Or, $90x + 80(x +1) = 720$  
$170x + 80 = 720$.  
$170x = 640$  
$x = 3.76$ which is approximately 3 hours and 45 minutes

We know that Agra express departs at 7 am. Also we had assumed that the trains cross each other at $x$ hours from the departure of Agra express. Hence the trains cross each other at $7 + x = 7 + 3.45 = 10.45$ am.
209. Ramesh and Kumaresh started at 8 am from Bangalore and Hyderabad respectively in their Santro cars and they were driving at uniform speeds of 80 km/hour and 100 km/hour respectively. On way the first car (the car moving towards Hyderabad) stopped running for an hour on account of technical problems. Both the cars crossed each other at 1 pm. What is the distance between Bangalore and Hyderabad?

a) 780 km  b) 800 km  c) 900 km  d) 820 km

**Answer:** d) 820 km

**Solution:**
The second car i.e. car approaching Bangalore has run for 5 hours at 100 km/hour and thus has covered a distance of 100 x 5 = 500 km.
The first car – car approaching Hyderabad has run effectively for 5 - 1 = 4 hours (we are subtracting 1 as there was stoppage for 1 hour due to technical problems) at 80 km/hour and has covered a distance of 80 x 4 = 320 km.

Hence, the second car has travelled 500 km towards Bangalore and the first car has run 320 Km towards Hyderabad when the cars met each other.

Hence distance between Hyderabad and Bangalore = Sum of the distances travelled by the cars from start till the cars meet = 500 + 320 = 820 km.

210. A man climbs 12 m in the first step and falls back 4 m in the next step. The process continues. How many steps are required to reach the pole of 68 m?

a) 7  b) 15  c) 8  d) 16

**Answer:** b) 15

**Solution:**
In the first step the man climbs 12 m. In the second step he falls back 4 m.
So in every two steps the man will climb up 8 m.
The height of the pole is 68 m.
In 14 steps he will reach 56 m. (8 x 7)
Then in the 15th step he will climb up 12 m and reach the top of the pole - 68m.

211. In a thick forest there is an old damaged well. The depth of the well is 47 feet. An old frog was struck up at the bottom of the well. The friends and foes of this frog were on the ground. The frog attempted to climb up to the ground. The friends of frog encouraged the frog to climb up 7 feet in one minute. Thereafter the foes of frog discouraged and made the frog go down 3 feet in the next one minute. After 10 minutes, more friends start gathering and their encouragement helped the frog to climb 9 feet instead of 7 in each cycle. This process continued. How many minutes will it take for the frog to reach the top of the well?

a) 20 minutes  b) 17 minutes  c) 21 minutes  d) none of these.

**Answer:** b) 17 minutes.

**Solution:**
The solution should be derived by splitting the time frame before and after 10 minutes.
For the first 10 minutes.
In the first minute the frog climbs up 7 feet.
In the second minute the frog goes down 3 feet.
In 2 minutes the frog will be 4 feet above the original spot.
Therefore, In the first 10 minutes, the frog would had climbed 20 feet. Lets say this spot as SPOT B.

From the 11th minute : (Note after 10 minutes, since the frog has already climbed 20 feet, there would be remaining 27 feet to climb)
In the first minute the frog climbs up 9 feet.
In the second minute the frog goes down 3 feet
In 2 minutes the frog will be 6 feet above the Spot B.
Therefore, In 6 minutes the frog will climb 18 feet above the Spot B.
In the 7th minute, it would climb 9 feet and would had reached the top \((18 + 9 = 27)\) and go away.
Therefore the frog needs to climb for \(10 + 7 = 17\) minutes

212. A male monkey and its pair were attempting to climb a tree of 93 metres. Both of them use to cooperate in the first minute and climb up 9 feet. In the second minute both the monkeys use to fight and climb down 5 feet. Will the monkeys be able to reach the top if the process continues like this and if so how many climb ups and climb downs would be required? (‘climb up’ refers to the action of monkeys climbing up in one stretch before climbing down. ‘climb down’ refers to the action of climbing down in one stretch before climbing up)
   a) No.
   b) Yes, 22 climb ups and 21 climb downs
   c) Yes, 24 climb ups and 23 climb downs
   d) None of these.
   Answer : b) Yes, 22 climb ups and 21 climb downs

Solution :
In the first minute they climb up 9 feet.
In the second minute they climb down 5 feet.
So after two minutes the monkeys will be 4 feet above the original level.
In 42 minutes they will be 84 feet above the original level. In 42 minutes, there would 21 climb ups and 21 climb downs.
In the 43rd minute they will climb 9 feet and reach the top. In 43rd minute, there would be one climb up.
In total, the monkeys would reach the top after 22 climb ups and 21 climb downs.

213. A horse is tied to a pole by a rope of length 21m. If the length of the rope is increased to 28m, then how much excess area will it be able to graze?
   a) 1386 m²  b) 1078 m²  c) 2464 m²  d) 1378 m²
   Answer : b) 1078 m²

Solution :
Let r and R be the original and new proposed lengths of the rope respectively.
Given r = 21 m and R = 28 m.
Area of the surface with radius \(r = \pi \times r^2 = \frac{22}{7} \times 21 \times 21 m^2 = 1386\) m²
Area of the surface with radius \(R = \pi \times R^2 = \frac{22}{7} \times 28 \times 28 m^2 = 2464\) m²
Therefore, Additional area for grazing if length is increased = \(2464 – 1386\) m² = 1078 m²
214. A cow was tied in the middle of the circular field by a rope of length 70 ft to graze the field. If the area of the circular field is 20000 sq.ft, then what is the area of the field that is not accessible to the cow?

a) 1540 sq.ft  b) 6400 sq.ft  c) 4600 sq.ft  d) 1450 sq.ft

Answer : c) 4600 sq.ft

Solution :
The length of the rope is 70 ft
The area grazed by the cow = \( \pi \times 70 \times 70 \) sq.ft = 15400 sq.ft
Given that the area of the circular field = 20000 sq.ft
Then, the area of the field not accessible to the cow = 20000 sq.ft – 15400 sq.ft = 4600 sq.ft

215. A man bought a field of length 250 m and breadth 200 m. He planned to build a house of area 37500 m^2. And in the remaining area he planned to cultivate wheat crop. What is the length of the cultivating area if the breadth is 50 m?

a) 150m  b) 250m  c) 350m  d) 200m

Answer : b) 250m

Solution :
Area of the field, he bought = 250 x 200 m^2 = 50000 m^2
Given that the area of the house = 37500 m^2
Then the remaining area = 50000 m^2 – 37500 m^2 = 12500 m^2
Also given that the breadth of the remaining area = 50 m
Then the length of the cultivating area = 12500 / 50 = 250 m

216. If a Cone and a sphere have equal volumes and equal radius of 6 cm, then what is the height of the Cone and the diameter of the Sphere?

a) 12cm, 24cm  b) 24cm, 6cm  c) 24cm, 12cm  d) 6cm, 24cm

Answer : c) 24cm, 12cm

Solution :
Let h be the height of the cone and r be the radius of the sphere as well as the radius of base of the cone.
Volume of the cone = \( \frac{1}{3} \times \pi \times r^2 \times h \) cm^3
Volume of the Sphere = \( \frac{4}{3} \times \pi \times r^3 \) cm^3
Given that r = 6 cm and Volume of the Cone = Volume of the Sphere
\( \frac{1}{3} \times \pi \times r^2 \times h \) cm^3 = \( \frac{4}{3} \times \pi \times r^3 \) cm^3
h = 4 x r cm
h = 4 x 6 cm
h = 24 cm
Diameter of the sphere = 2r = 12 cm

217. A hemisphere bowl was filled with milk. The radius of the bowl was 20 cm. If the same quantity of milk was filled in another conical vessel of same radius, then what is the height of the new conical vessel?

a) 20cm  b) 60cm  c) 40cm  d) 80cm

Answer : c) 40cm

Solution :
Given that the radius of the bowl = 20 cm
Since the quantity of the milk is same in both conical vessel and hemisphere bowl,
Volume of the hemisphere bowl = Volume of the conical vessel
\[ \frac{2}{3} \pi r^3 = \frac{1}{3} \pi r^2 h \]
\[ 2r = h \]
h = 40 cm
Hence, the height of conical vessel is 40 cm.

218. Nithesh built a wall around his house. After two years, he increased the length and the breadth of the wall by 20% and 15%. Then what is the consequent increase in area?
a) 23% b) 28% c) 38% d) 32%
Answer : c) 38%

Solution :
Let the length and breadth of the wall be L and B.
Increase in length = 20% = L x 20/100 =0.2 L
Then, New length = 1.2 L
Increase in breadth = 15% = B x 15/100 =0.15 B
Then, New breadth = 1.15 B
New area = 1.2L * 1.15B = 1.38 LB
Increase in area = 0.38 LB
Area increased in % = 0.38 LB / LB x 100 = 38%

219. Bala started driving from Chennai at 5pm to reach Bangalore. At 6pm, Siva started driving from Bangalore to reach Chennai. Bala travelled at 40 km/hr and Siva travelled at 50 km/hr. If the distance between Bangalore and Chennai is 310 km, then at what time will they meet?
a) 9.30pm b) 10pm c) 9pm d) 8.30pm
Answer : c) 9pm

Solution :
Suppose Bala meets Siva X hours after 5pm.
Then Siva meets Bala X - 1 hours after 6pm. (Since he started 1 hour late)
Distance covered by Bala in X hours = 40 x X
Distance covered by Siva in X - 1 hours = 50 x (X - 1)
Given, Distance between Chennai and Bangalore = 310 km
Hence, 40X + 50 (X-1) = 310
90X = 360
X = 4
Hence, Bala will meet Siva after 4 hours.
That is, they will meet at 9pm.

220. Pandiyan Express and Nellai Express are running in the same direction with speeds of 77 km/hr and 68 km/hr. And the length of Nellai Express is 115 metres and the Pandiyan Express is 135 metres. Assume Pandiyan Express's engine is just behind the last carriage of Nellai express on parallel tracks (not same track ). Now, how much time will be taken by Pandiyan express to cross the Nellai express.
a)1 min 10 sec b) 1 min 05 sec c) 1 min 40 sec d) 1 min 25 sec
Answer : c) 1 min 40 sec

Solution :
The Relative Speed of the Nellai Express with respect to Pandiyan Express = (77 – 68) km/hr = 9 km/hr
Relative speed in metres per second = (9 x 5/18) m/sec = 5/2 m/sec.
Time taken by Pandiyan Express to cross Nellai Express = Time taken to cover (115 + 135) metres at 10 seconds with the relative speed
= 250/(5/2) seconds = 100 seconds. (i.e.) 1 min 40 sec (Using the time = distance / speed formula)

221. At 8 p.m., Vaigai Express from Madurai and The Chennai Express from Chennai are moving in opposite direction at 40 km/hr and 60 km/hr. At Trichy, they meet each other. If the distance covered by the Chennai Express was 100 km more than the Vaigai Express at Trichy, then the distance between Chennai and Madurai is?
a) 500 km b) 300 km c) 200 km d) 400 km
Answer : a) 500km

Solution :
Let the distance travelled by Vaigai Express be d.
Then the distance travelled by Chennai Express is d + 100.
We know that Time = Distance / Speed.
Since the time travelled by both trains is same, d / 40 = (d + 100) / 60.
20d = 4000.
d = 200.
Therefore, the distance travelled by Vaigai Express is 200 km and the distance travelled by Chennai Express is 300 km.
Hence, the distance between Chennai and Madurai is 500 km.

222. A train A leaves from Agra at 4.30 a.m. and reaches Delhi at 7.30 a.m. And a train B leaves from Delhi at 6.30 a.m. and reaches Agra at 8.30 a.m. At what time do the two trains cross each other?
a) 7.06 a.m. b) 6.45 a.m. c) 7.15 a.m. d) 6.54 a.m.
Answer : d) 6.54 a.m.

Solution :
Let the distance between Delhi and Agra be X.
And let the train A meet the train B be Y hours after 6.30 a.m.
Then, train A covers X km in 3hrs and B covers X km in 2hrs. (you can find the durations of travel from the time of start and arrivals of the trains as given in question)
Therefore, Speed of Train A = X / 3 km/hr and Speed of Train B = X / 2 km/hr
Distance covered by the train A in (Y+2) hrs + Distance covered by the train B in Y hrs = X. (We are using Y + 2 hours in this equation for train A as it has started 2 hours earlier)
(X/3) x (Y+2) + (X/2) x Y = X
Y/3 + 2/3 + Y/2 = 1
5Y = 2
Y = 2/5 hr.
\[ Y = \left(\frac{2}{5}\right) \times 60 \text{ min} = 24 \text{ min}. \]

Hence, the train A meet the train B at 6.54 a.m.

223. Construction of a water tank was completed recently in La Celeste Complex. It was fitted with two pipes – one a BIG pipe and another a SMALL pipe. BIG pipe when used for filling the water tank it takes 8 hours. The tank is filled fully by SMALL pipe in 10 hours. The contractors wanted to find out how long it will take if SMALL pipe is switched on for an hour and BIG pipe is switched on for the next hour. If this process is repeated how long it will take for the tank to be filled in completely.

a) 12 hours b) 9 hours c) 5 hours d) 8 hours

**Answer :** b) 9 hours.

**Solution :**

SMALL pipe (S) can fill in one hour \(\frac{1}{10}\) of the water tank.
BIG pipe (B) can fill in one hour \(\frac{1}{8}\) of the water tank.

So in two hours (first S Pipe is open for the first hour and then B pipe is open for the second hour) tank would be filled by \(\frac{1}{8} + \frac{1}{10} = \frac{18}{80} = \frac{9}{40}\) of the tank.

So in 4 times this i.e. 8 hours both the pipes will fill \(\frac{36}{40}\) of the tank.

Balance = \(\frac{4}{40} = \frac{1}{10}\).

So when for the 9th hour S pipe runs the tank will be full.
That means it takes totally 9 hours for the two pipes to fill in this order.

224. There are two types of pipes fitted for a water tank kept in the 15th floor top of the new building constructed by Kaizen Constructions recently in Maharanipet, Hyderabad. The motor is kept on the ground near the corporation water sump from which the water is pumped up. Reddy Pipe takes 50 minutes to fill the tank. Rao Pipe takes 100 minutes to fill the tank.

Both pipes were started at 10.30 am. Rao pipe was closed after some time. Reddy pipe continued to fill water to the tank and the tank got filled at 11.10 am. At what time the Rao pipe was closed?

a) 10.40 am b) 10.50 am c) 11.00 am d) cannot be determined.

**Answer :** b) 10.50 am

**Solution :**

Reddy pipe can fill in one minute \(\frac{1}{50}\) of the tank.
Rao pipe can fill in one minute \(\frac{1}{100}\) of the tank.

In one minute when both the pipes run they will fill \(\frac{1}{50} + \frac{1}{100} = \frac{3}{100}\) of the tank.

<table>
<thead>
<tr>
<th>Minutes Taken</th>
<th>Tank Filled By Both The Pipes</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>(\frac{3}{100})</td>
</tr>
<tr>
<td>?</td>
<td>Full</td>
</tr>
</tbody>
</table>

If both the pipes run they will take \(100/3 = 33 \frac{1}{3}\) minutes to fill the Full tank.
But since Rao pipe was closed after \(X\) minutes it has taken 40 minutes for the other pipe to complete filling the tank.

<table>
<thead>
<tr>
<th>Minutes Taken</th>
<th>Tank Filled By Reddy's Pipe</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>(\frac{1}{50})</td>
</tr>
<tr>
<td>40</td>
<td>?</td>
</tr>
</tbody>
</table>
In 40 minutes Reddy pipe would had fill $\frac{1}{50} \times 40 = \frac{4}{5}$ of the tank.

That means $1 - \frac{4}{5} = \frac{1}{5}$ of the tank should had been filled by Rao pipe.

<table>
<thead>
<tr>
<th>Minutes Taken</th>
<th>Tank Filled By Rao's Pipe</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>$\frac{1}{100}$</td>
</tr>
<tr>
<td>?</td>
<td>$\frac{1}{5}$</td>
</tr>
</tbody>
</table>

Rao pipe has worked for $\frac{1}{5} \times 100/1 = 20$ minutes

So Rao pipe was closed 20 minutes after 10.30 i.e till 10.50 am.

225. Sumanth Constructions took up fitting up of two taps called Apple and Micro and these fill the tank in 24 minutes and 40 minutes respectively. Apple pipe runs for one minute and closed. Then for the next one minute Micro pipe runs and closed. This process is repeated for up to 12th minute end. Then the balance volume of water to be filled in the tank to make it fill – in terms of percentage is:

a) 60%  
b) 50%  
c) 33 1/3%  
d) 45%

Answer : a) 60%

Solution :

Apple tap will fill 1/24 of the tank in one minute.

Micro tap will fill 1/40 of the tank in one minute.

According to the problem

Apple pipe runs for one minute and then Micro pipe runs for next one minute.

So in 2 minutes they will together as above = $(1/24 + 1/40) = 1/15$

So in six times the above process or in totally 12 minutes they will fill $1/15 \times 6 = 6/15 = 2/5$ th of the tank

Balance to be filled in = $1 - 2/5 = 3/5$

Balance to be filled in terms of percentage = $3/5 \times 100\% = 60%$

226. In Dubai city there are a number of skyscrapers. Grand Hotel building at Dubai was fitted with “Highrun” lifts. On the first day after fitting the lift there appeared a few technical issues.

The lift was moving 8 floors per minute initially and in the next minute it fell down by 3 floors. This process continued throughout that day. It took 65 minutes for the lift to reach top most floor for the first time and then it stopped there. How many floors are there in that building.

a) 168  
b) 178  
c) 160  
d) 184

Answer : a) 168.

Solution :

The lift covers 5 floors in 2 minutes. (since it is given the lift was moving 8 floors per minute initially and in the next minute it fell down by 3 floors)

In 64 minutes it will cover $5 \times 32 = 160$ floors.

In the 65 the minute it will go 8 floor up and stay there on top.

That means totally there are 160+8 = 168 floors.

227. A roadside magician/tricks -player in Jalpaiguri (West Bengal) demonstrates his skill of climbing up a pole fitted on the ground. He performs this feat before the audience who encourage him sufficiently. It was observed that in the first minute he takes 15 seconds to climb one metre. After that in the next minute he shows the public that he climbs down. For
that he takes 20 seconds to climb down. He repeats this process of climbing up for the first minute and climbing down in the next minute. After how many minutes will he reach the top of a pole of 42 metre height and decides to stay there and show public?

a) 77 min b) 84 min c) 79 min d) cannot be ascertained.

Answer : a) 77 min.

Solution :
In the first minute he climbs up 4 metres of the pole. (he climbs 1 metre in 15 seconds. Therefore he climbs 4 metres in 60 seconds i.e 1 min)
In the next minute he goes down 3 metres of the pole. So at the end of 2 minutes he has gone up by 1 metre. (he climbs down 1 metre in 20 seconds. Therefore he climbs down 3 metres in 60 seconds i.e 1 min)
Assuming, this process is repeated he will take 76 minutes to reach 38 metre height of the pole.
And in the next minute he will be able to reach 42 metre top and stays there.
Thus he takes 77 minutes to do this.

228. Kiran Raj, son of Dhoni is aged 3 years. Dhoni and his wife Amarinder admitted him in a play school. Yuvaraj, 24 year old instructor at the play school taught Kiran Raj the game of construction of plastic blocks of same size but in different colours. Children were expected to construct the blocks one above the other and allow it to stay at the end of every minute. Yuvaraj was enjoying the activity in a funny way. He was constructing 9 blocks in the first minutes and in the following minute he was removing 4 blocks. Surprisingly Kiran Raj was repeating the same feat for 31 minutes. At the end of 31st minute how many blocks would he have constructed?

a) 80 b) 75 c) 83 d) 84

Answer : d) 84

Solution :
(This question is very similar to 1st question)
Kiran Raj constructs 9 blocks in the first minute and removes 4 blocks in the second minute.
So at the end of 2nd minute he would have constructed 5 blocks.
Assuming he repeats this process till 30 minutes (15 x2) – he would have constructed 75 blocks (i.e.15 x 5). So in the 31st minute he will construct 9 blocks and at the end of 31st minute he would have constructed 75 + 9 = 84 blocks.
(Note: In this type of problems you have to read the question carefully. Many times questions are framed too lengthy to distract the attention of candidates.)

229. Brindavan Express started from Chennai Central Station at 7.10 am. Karnataka express train for the same destination started from the same station on the same day at 8.40 am and ran with an average speed of 60 km/hour. Karnataka express crossed the Brindavan Express at 11.40 am. Find the average speed of Brindavan Express.

a) 75 km/hr b) 40 km/hr c) 30 km/hr d) 45 km/hr

Answer : b) 40 km/hr.

Solution:
Karnataka Express train crosses the Brindavan Express in three hours
Distance covered by Karnataka express when it crosses Brindavan Express = Speed of
Karnatak Express \times \text{Time Until It Crosses Brindavan} = 60 \times 3 = 180 \text{ km}

This means that, Brindavan express would have covered the same distance 180 km from Chennai when it is crossed (Overtook) by Karnatak.

The distance covered by Brindavan Express from 7.10 am till 11.40 am = 180 km (in 4 1/2 hours)

So the average speed of Brindavan Express is = \frac{\text{Distance covered by Brindavan till crossing}}{\text{Time taken till crossing}} = \frac{180}{4 \ 1/2} = 40 \text{ km/hour}

230. Tata Indica car started from Mumbai towards Kolkata at 6 am and travelled at an average speed of 60 km/hr. It was found that an important material to be sent to Kolkata was omitted to be included in the packets sent in Tata Indica car. The omitted material was carried on an Innova car that started at 8.15 am and travelled with an average speed of 90 km/hr. At what time Innova car will cross Tata Indica car?

a) 1.15 pm b) 3.15 PM c) 12.45 pm d) 4.15 pm

Answer : c) 12.45 p.m.

Solution :  
Indica had started 2 hours 15 mins in advance to that of Innova Car  
Before, Innova started, Tata Indica covers a distance of 135 km in 2 hours and 15 minutes. 
(you can check this by using the formula Speed \times \text{Time} where speed of Indica = 60km)  
Innova travels at 90 km/hr.  
Relative speed of Innova with respect to Indica = Speed of Innova - Speed of Indica = 90 - 
60 = 30 km/hr  
\text{Time that would be taken by Innova to catch up with Indica} = \frac{\text{Distance Difference at Start of Innova}}{\text{Relative Speed of Innova with respect to Indica}} = \frac{135}{30} = 4 \ 1/2 \text{ hours}  
for Innova to cross Tata Indica  
Innova started at 8.15 am. It will cross Tata Indica at 12.45 pm.

231. A Transport bus started Madurai Bus Terminal at 7 am and travelled at an average speed of 40 km per hour till 8.30 am. This bus stopped at the on-way hotel for breakfast till 9 am and travelled at an average speed of 30 km per hour thereafter till its destination. Another express bus started from Madurai at 11 am and travelled at an average speed of X km per hour. The Express bus crossed the transport bus at 5 pm on the same day. Find the value of X?

a) 60 km/hr b) 40 km/hr c) 20 km/hr d) 50 km/hr

Answer : d) 50 km/hr

Solution :  
Transport bus travelled at average speed of 40 km/hour  
For 1 1/2 hours (i.e from 7 am till 8.20 am) Distance covered = 60 km.  
Express bus starts at 11 am.  
Till the express bus starts, transport bus would have covered further distance of 30 \times 2 = 60 km.  
Total distance covered upto 11 am by Transport bus is 60 + 60 = 120 km  
Transport bus is travelling further at an average speed of 30 km per hour.  
Express bus crossed Transport bus at 5 pm after travelling for 6 hours.
Distance covered by the Transport bus till 5 pm = 120 + 180 = 300 km
This distance of 300 km is covered by express bus in 6 hours.
Hence average speed of Express bus = X = 300/6 = 50 km/hour

232. A shop keeper has announced 25% rebate on prices of ready-made garments at the time of sale. If a purchaser needs to have a rebate of Rs.400, then how many shirts, each costing Rs.320, should he purchase?
a) 10 b) 7 c) 6 d) 5
Answer : d) 5

Solution :
Each shirt costs Rs.320. Rebate allowed is 25%.
For each shirt it works out to 320/100 X 25 = Rs.80
Purchaser wants to have a rebate of Rs. 400. For each shirt he gets a rebate of Rs.80.
So for getting a rebate of Rs.400 he has to buy 400/80 = 5 shirts.

233. A merchant makes a profit of 20% by selling an item at a certain rate. If he charges Rs.8 more on each item, he earns a profit of 60%. What is the cost price of the item?
a) Rs.16 b)Rs.25 c)Rs.20 d)Rs.36
Answer : c) Rs.20

Solution :
Let the cost price be Rs. Y
Therefore initial selling price (at a profit of 20%) will be
Y x 120/100 = 6Y/5
Now if he charges Rs. 8 more, then he earns 60% profit.
In other words, 8 Rupees added to the selling price at 20% profit will be equal to the selling price at 60% profit.
Mathematically we can write the above statement as,
6Y/5 + 8 = Y x 160/100 = 8Y/5
6Y + 40 = 8Y
Y = Rs. 20

234. A shop keeper sells at 250% profit of the cost. If the cost increases by 20% but the selling price remains constant, what percent of selling price is his profit?
a) 75.71 b)55.71 c)45.71 d)65.71
Answer : d)65.71

Solution :
Let the cost price be Rs.100
Marked price (selling price at 250% profit) = CP + (Profit Percentage/100) x CP
= 100 + (250/100) x 100 = Rs. 350
If the cost price is increased by 20%, the Revised cost price = Rs.120
Revised profit = Selling Price – Revised Cost Price = 350-120 = 230
Profit Over Selling Price Percentage = Revised Profit/Selling Price x 100 = (230/350) x 100 = 65.71%
235. The marked price of a clock is Rs.6400. It is to be sold at Rs.4896 at two successive discounts. If the first discount is 10%, the second discount is a) 10% b)4% c)15% d)20% 
**Answer : c)15%**

Solution :
Marked price = Rs. 6400  
Price after first discount of 10% = 6400 x 0.9 = Rs.5760  
Selling price = Rs.4896  
Therefore second discount = \( \frac{\text{Price after first discount} - \text{Selling Price}}{\text{Price after first discount}} \times 100 = \frac{5760 - 4896}{5760} \times 100 = 15\% \)

236. A shopkeeper marks his goods 30% above the cost price and then allows 15% discount on it. What is the cost price of an article on which he gains Rs.840?  
a)Rs.6400 b)Rs.8000 c)Rs.7000 d) Rs.9000  
**Answer : b)Rs.8000**

Solution :
Let the cost price be Rs.100  
Marked price = Rs.130  
Discount allowed = 15%  
Then selling price will be 130 -19.5 = 110.5  
The gain when cost price is Rs.100 = 110.5 - 100 = 10.5  
Cost Price Gain  
100 10.5 = 840  
\( \frac{840}{10.5} \times 840 = 8000 \)

237. A shopkeeper sells a DVD player for Rs. 2880 and he makes the same percentage of profit as the loss percentage on selling price he makes if he sells at Rs.1920. What is the price at which the shopkeeper should sell this DVD player if he wants to make 30% profit?  
a) Rs.3000 b)Rs.3120 c)Rs.3240 d) Rs. 3240  
**Answer : b)Rs.3120**

Solution :
Let the cost of price of DVD player be D  
Profit percentage when he sells at Rs.2880 = Loss percentage when he sells at 1920  
i.e., \( \frac{2880-D}{D} \times 100 = \frac{D - 1920}{D} \times 100 \)  
2880 -D = D - 1920  
2880 + 1920 = D + D  
4800 = 2 D  
D = Rs. 2400  
Cost price = Rs. 2400. He wants to make 30% profit. (In the absence of special mention profit is always calculated on cost price.)  
The desired profit amount = 30% of Rs.2400 = (2400 x 30) / 100 = 720.  
Hence, The selling price = CP + Desired Profit = 2400 + 720 = Rs. 3120.
238. A student was asked to multiply a number by 45. But by mistake he multiplied it by 54. The answer he got was 9540 greater than the correct answer which he would had got if he had correctly multiplied by 45. What could be the number?

**Answer:** 1060

This is a very easy question to solve.

Let the number be x.

According to the question. $54x = 45x + 9540$

or $9x = 9540$

or $x = 1060$

239. A bag of rice of 40 Kgs is available with Ram. Let Ram sells 60% of the rice he has to Raju at a discount of 5% and sells the remaining rice at a profit of 7%. What is his loss percentage.

**Answer:** 0.2%

Let the cost price of the bag be Rs. 100. Therefore price per Kg would be $100/40 = 2.5$

60% of rice is sold at 5% discount and remaining 40% is sold at 7% profit.

60% of rice = $(60/100) \times 40 = 24$Kg.

Cost Price of 24 Kg of rice = $24 \times 2.5 = 60$

Selling Price of 24 Kg of rice (at 5% discount) = $(95/100 \times 60) = 57$

Cost Price of remaining 16 Kg of rice = $16 \times 2.5 = 40$

Selling Price of 16 Kg of rice (at 7% profit) = $(107/100 \times 40) = 42.8$

Total selling price by Ram = 99.8

Net loss = 100 - 99.8 = 0.2

Loss percentage = Loss/CP x 100% = $0.2/100 \times 100 \% = 0.2\%$.

240. Consider two trains A and B in stations I and II respectively with a distance of 150Km between them. A travels at a speed of 60 Km/hour and B travels at a speed of 100 km/hr towards each other in parallel tracks. A has started with a delay of 6 minutes compared to that of B. Find the distance at which the two trains will meet when measured from station II.

**Answer:** 97.5 Km from station II.

The distance between the trains = 150

For the first six minutes, when A is at rest, the distance covered by B from station II = Speed of B in Kmph X Time in hours = $100 \times 6/60 = 10$ Km. -> eq 1

After six minutes, the distance between two trains = 150 - 10 = 140 Km.

From now on, relative speed of B with respect to A = Speed of B + Speed of A = 160 Kmph.

Time when B will cross A = Distance between B and A / Relative speed of B with respect to A = $140/160 = 7/8$ hours.

In 7/8 hours distance covered by B = Speed of B in Kmph X Time in hours = $100 \times 7/8 = 87.5$ Km. -> eq 2

Adding values of eq 1 and eq 2 we will get the answer which is 97.5 Km from station II.
241. 1) A bookseller sells a particular novel at 10% discount on the labeled price. Also he is so generous that he gives a free book for every 15 books for wholesale buyers. In this transaction his gain is 35%. Then find the ratio of Ratio of Labeled Price to the actual CP.

**Answer:**

Let's assume the CP of each book be 100. Hence CP of 16 books would be 1600. SP of 15 books = 1600 + (1600 * 35/100) = 2160. SP of each book would be 2160/15 = 144.

If SP of each book is 90, labeled price would be 100 (since he gives at a 10% discount). Hence if SP is 144 marked price would be 144*(100/90) = 160.

Ratio of Labeled Price to the actual CP = 160/100 = 8/5.

242. If a pen is being sold at 4% profit instead of 4% loss the actual profit is Rs 16. What is the actual cost price of the pen?

**Answer:**

Let x be the CP.

\[(104/100)x - (96/100)x = 16\]

Solving we get x = Rs.200.

243. A cake seller sells one cake at a profit of 10% and sells another at a loss of 5%. Let the ratio of the CPs of the cakes is 2:3 respectively. Find his net profit or loss percentage.

**Answer:**

Let the CPs of the cakes be 2x and 3x (so that they are in the ration 2:3 as per the question.) Hence net CP = 5x.

SP of first cake = (110/100)*2x = 220x/100
SP of second cake = (95/100)*3x = 285x/100
Net SP = (220x/100) + (285x/100) = 505x/100 = 5.05x.
SP is greater than CP and his profit is 5.05x - 5x = .05x.
His profit percentage = (.05x/5x)% = .01%.

PROBLEMS ON STOCKS AND SHARES

244. Sunita Devi studied B.Tech (ECE) from a leading college in Tamil Nadu during the years 2004-2008. She got placed in a leading software company based in Bangalore. She was selected in the campus recruitment held in January 2008 and was posted immediately to Hyderabad. Sunita Devi worked in Hyderabad, New Delhi and subsequently was sent for an overseas assignment in USA. She saved considerable amount of money and was keen to invest in stock market. She bought shares investing sizable amount in it. On account of spurt in stock market rates the cost of shares rose by 0.35 p per share and she was compelled to pay Rs.219.80 more than the earlier agreed price. How many shares did Sunita Devi purchase?

a) 658 b) 628 c) 638 d) 858

**Answer:** b) 628 shares

**Solution:**
Increase in price of share - Rs.0.35 per share
Increase in cost of shares - 219.80

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<th>Increase in cost</th>
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<td>0.35</td>
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<tr>
<td>?</td>
<td>219.80</td>
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Number of shares bought --- 219.80 / 0.35 = 628

245. Champakam Investments had an offer for investment at 7 ½% stock at 105 and 6 ½% stock at 94. As a consultant which investment will you recommend to Champakam Investments?

a) 7 ½% stock at 105
b) 6 ½% stock at 94
c) Both are same
d) None of these.

Answer : a) 7 ½% stock at 105

Solution :
Case I : Consider 7 ½% stock at 105 :
On investing Rs.105, income = 7 ½ = Rs.15/2
On investing Rs.105 x 94 , income = Rs. [ 15/2 x 1/105 x 105 x 94 ] = Rs.705

Case II : Consider 6 ½% stock at 94 :
On investing Rs.94, income = Rs.13/2
On investing Rs. (105 x 94), income to Rs. [ 13/2 x 1/94 x 105 x 94 ] = Rs.682.50
Hence for same amount of investment i.e Rs.105 x 94, income on 7 ½% stock at 105 is more.

246. Mr. Rathinasabapathy buys Rs.20 shares paying 9% dividend. He wants to have an interest of 12% on his investment. What should be the market value of each share he is buying?

a) Rs.12 b) Rs.15 c) Rs.21 d) Rs.18

Answer : b) Rs. 15

Solution :
Dividend on 20 Rs. shares = 9/100 x 20 = Rs.9/5
(Note: 1. Readers must understand the fact that the value of a share need not be its market price. For example, in our case, Rs. 20 is the actual value of the share but it may not be equal to the market price which will raise and fall based on demand and market conditions. 2. However, dividend is always calculated on the actual share value and not the market price )
Let $M$ be the market price of the 20 Rs share:
For the dividend to be 12%, it must satisfy the equation \((\frac{12}{100}) \times M = \frac{9}{5}\)
Or, \(M = \frac{100}{12} \times \frac{9}{5} = \text{Rs. 15}\)

247. Venkatanarayana Road, T.Nagar, Chennai 600017 has a playground that is circular in shape. Mukesh started running in clock wise direction from point X. Anil started running from point X in anti-clockwise direction. Mukesh ran 550 m and Anil ran 330 m before they met each other. What is the area of this ground?

a) \(\pi \times 16.9 \times 102 \text{ m}^2\)

b) \(\pi \times 1.97 \times 102 \text{ m}^2\)

c) \(\pi \times 19.6 \times 102 \text{ m}^2\)

d) \(\pi \times 1.69 \times 102 \text{ m}^2\)

**Answer : c) \(\pi \times 19.6 \times 102 \text{ m}^2\)**

**Solution :**
Circumference of a circle = \(2 \times \frac{22}{7} \times \text{radius}\)
Mukesh has run 550 m and Anil has run 330 m before they met. So the circumference of the circle would be the sum of the distances they covered = 550 m + 330 m = 880 m.
Circumference = 880 m = \(2 \times \frac{22}{7} \times R\)
\(R = \frac{880 \times 7}{2 \times 22} = 140 \text{ m}\).
Area = \(\pi \times R^2 = \pi \times 19.6 \times 102\)

248. Cubbon Park, Bangalore has a circular garden inside it constructed hundreds of years ago. Bangalore Corporation has been maintaining this garden nicely. Many people – retired persons, young persons go for jogging around this circular garden in the early mornings. The radius of the garden is 777 m. Rajendra Kumar and Nagendra Kumar are two close friends. One day they started jogging from a point on the border of circle—Rajendra Kumar went in anti clockwise direction and Nagendra Kumar went in clockwise direction. Nagendra Kumar met Rajendra Kumar after travelling 2416 Km lesser than that would had been covered by Rajendra Kumar. What is the distance covered by Rajendra Kumar before meeting Nagendra Kumar?

a) 3560 m

b) 5360 m
c) 3650 m
d) none of these.

**Answer : c) 3650 m**

**Solutions :**
Total circumference of the circular garden = \(2 \times \frac{22}{7} \times 777 = 4884 \text{ m}\).
Let the distance covered by Nagendra Kumar when they met be \(X\).
Let the distance covered by Rajendra Kumar when they met be \(Y\).
It is given that \(Y - X = 2416 \rightarrow \text{eq 1}\)
Also we know that sum of the distances covered by both the friends should be equal to the circumference of the circle.
Therefore \(Y + X = 4884 \rightarrow \text{eq 2}\)
Adding equations 1 and 2 we get \(2Y = 7300\)
Therefore \(Y = 3650\). Hence, Distance covered by Rajendra Kumar = 3650 m

249. There is a circular garden in Mattuthavani, Madurai and is being maintained by a private transport company for many years. The radius of the ground is 1554 m. Gunaseelan and Munusamy started running from a point at the circumference in opposite directions. Gunaseelan ran at an average speed of 60 metres per minute and met Munusamy after
running for 44 minutes. How much distance Munusamy would have covered before meeting Gunaseelan?

a) 7128 m  b) 6128 m  c) 5456 m  d) none of these.

Answer : a) 7128 m

Solution :
Circumference of circular ground = 2 x 22/7 x 1554 m = 9768 m
Distance covered by Gunaseelan in 44 minutes travelling at 60 metres per minute = 60 x 44 = 2640 m
Let distance covered by Gunaseelan when they met = X. We have already found X to be 2640 m.
Let distance covered by Munusamy when they met = Y.
Similar to previous question, we have X + Y = Circumference
2640 + Y = 9768
Distance covered by Munusamy = Y = 9768 - 2640 = 7128 m

PROBLEMS ON PROBABILITY

250. Ramasamy, the HRD Manager of a leading software company was conducting interview in a leading college in Hyderabad. He posed the following question to the candidate: “Two dice are thrown together. What is the probability that the sum of the numbers on the two faces is divisible by 4 or 6?”. What would be the answer ?
a) 1/2  b) 7/18  c) 5/18  d) 11/18

Answer : b) 7/18

Solution :
N(S) = 6 x 6 = 36
Let E be the event that the sum of the numbers on the two faces is divisible by 4 or 6. Then
E = (1,3), (1,5),(2,2),(2,4), (2,6) (3,1), (3,3) (3,5), (4,2), (4,4),(5,1) (5,3),(6,2),(6,6)
n(E) = 14
Let S denote all possible combinations of numbers on faces of both the dice.
S = (1,1),(1,2),(1,3),(1,4),(1,5),(1,6),(2,1),(2,2)..............................(6,6)
n(S) will be 36 as you would be knowing.
P (E) = n(E) / n(S) = 14/36 = 7/18.

251. Meenakshi Devi and S.N. Lakshmi, HR Managers of a leading construction company conducted interview for the civil engineering students of Ideal Engineering College. The following question was asked to a candidate:
“ Two dice are thrown together. One of the dice had 0 printed on the side where originally it should had been 6. Whenever the face with 0 is shown, it is counted as an error. However if the sum of the numbers of faces is divisible by 3 or 6, the throw is considered valid even in case of 0 showing up on the defective die. What is the probability of errors ?
a) 1/6  b) 1/9  c) 1/18  d) none of these.

Answer : a) 1/9

Solution :
When the dice are thrown together, there are six possible occurrences when the face with 0 would be shown on the defective die. They are (0,1),(0,2),(0,3),(0,4),(0,5) and (0,6) However, in the above set, there are two occurrences (0,3) and (0,6) where the sum of faces is divisible by 3 and 6 respectively. These should not be counted as errors as per the rules given in the question. Therefore the error set is as follows (0,1),(0,2),(0,4) and (0,5) If E denote the error occurrence, then n(E) = number of error combinations = 4 (from above explanation) P(E) = n(E)/n(S) = 4/36 = 1/9

252. Two friends namely Rahul and Ravi are participating in a dice throwing competition involving two dice. Each would be allowed to throw the dice for 100 times. When Rahul throws his 100 turns, whenever the numbers on faces of dice add up to 4, he will score a point. Similarly when Ravi throws his 100 turns, whenever the numbers on faces add up to 7, he will score a point. When things are unbiased, who has better chance of winning?
(a) Rahul (b) Ravi (c) Anyone can be (d) Can't be determined
Answer : (b) Ravi

Solution:
In this question, the mentioning of '100' throws is just to trick and mislead readers. As long as probability is used to determine the possible winner, 100 throws or 1000 throws is not going to make a difference. Now let us try to solve the problem by calculating the probability of success of Rahul and Ravi.

Probability of Success of Rahul:
Let X denote the event of successful throws by Rahul
Then X would include the combinations : (1,3),(2,2),(3,1)
Therefore N(X) = 3
P(X) = N(X)/N(S) = 3/36

Probability of Success of Ravi:
Let Y denote the event of successful throws by Ravi
Then Y would include the combinations : (1,6),(2,5),(3,4),(4,3),(5,2),(6,1)
Therefore N(Y) = 6
P(Y) = N(Y)/N(S) = 6/36

Inference : P(Y) is greater than P(X). Therefore, Ravi has better chance of winning.

253. At University of Probability, there are 375 freshmen, 293 sophomores, 187 juniors, & 126 seniors. One student will randomly be chosen to receive an award. What percent chance is there that it will be a junior? Round to the nearest whole percent.
Answer
19%

254. If you were to dial any 7 digits on a telephone in random order, what is the probability that you will dial your own phone number? Assume that your telephone number is 7-digits.
Answer
1 in 10,000,000

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255. An anthropologist discovers an isolated tribe whose written alphabet contains only six letters (call the letters A, B, C, D, E and F). The tribe has a taboo against using the same letter twice in the same word. It's never done. If each different sequence of letters constitutes a different word in the language, what is the maximum number of six-letter words that the language can employ?
Answer
The language can employ maximum of 720 six-letter words.

256. Kate, Demi, Madaon, Sharon, Britney and Nicole decided to lunch together in a restaurant. The waiter led them to a round table with six chairs. How many different ways can they seat?
Answer
There are 120 different possible seating arrangements.

257. Dhanush Kumar Raja came across a jar containing pure milk in full. He removed 9 litres of milk and refilled with water. This action is performed three more times. The ratio of left out milk after operations to the original quantity of milk that was present is 16:81. How much milk did the jar contained initially?
a) 24 b) 81 c) 108 d) 27
Answer : d) 27 litres.
Solution :
Formula To Remember:
In problems on mixtures, you often would use the below formula.
Consider a vessel containing x litres of liquid from which y litres are replaced by water. After n such operations / replacements the quantity of liquid would be \( x (1 - \frac{y}{x})^n \) litres.
Let the quantity of milk originally that was present in the jar be \( x \) litres.
Then, quantity of milk left in the jar after four operations = \( [ x (1 - \frac{9}{x})^4 ] \) litres
Ratio of left out milk after operations to the original quantity of milk = \( [ x (1 - \frac{9}{x})^4 ] / x \) litres = \( [1 - \frac{9}{x}]^4 \) litres.
But the above ratio is given to be 16/81. Therefore,
\[ [1 - \frac{9}{x}]^4 = \frac{16}{81} = \left[\frac{2}{3}\right]^4 \]
\[ (x - 9)/x = 2/3 \]
x = 27 litres

258. Saravana Kumar Drinks shop has a jar filled with wine fully. In order to satisfy the customers the following procedure was adopted. 12 litres of wine is removed from the jar and filled with water. This process is repeated two more times. The ratio of left out wine after operations to the original quantity of wine present is 27/64. How much wine was there in the jar originally?
a) 48 b) 27 c) 81 d) 40
Answer : a) 48 litres
Solution :
Let the quantity of wine in the jar initially be ‘x’ litres.
Then, quantity of wine left in the jar after three operations = \[ x \left(1 - \frac{12}{x}\right)^3 \] litres
Ratio of left out wine after operations to the original quantity of wine = \[ \frac{x \left(1 - \frac{12}{x}\right)^3}{x} \] litres = \[1 - \frac{12}{x}\]^3 litres.
\[1 - \frac{12}{x}\]^3 = \frac{27}{64} = \left(\frac{3}{4}\right)^3
\[ \frac{1 - 12}{x} = \frac{3}{4} \]
x = 48 litres

259. Bhairavi Hoteliers has a vessel filled with liquid, 4 parts of which is filled with water and 5 parts filled with milk. How much of the mixture must be drawn out and filled with water so that the mixture may contain half milk and half water?
a) 1/9 b) 1/10 c) 3/10 d) 2/9
Answer : b) 1/10

Solution :
Note : It is given that, initially, the liquid had 4 parts of water and 5 parts of milk. Adding gives 9 parts. For such problems, assuming the initial quantity to be multiple of sum of the parts of the two liquids will make the calculations much easier. In this case, let us assume the initial composite liquid (milk + water) quantity be 9 litres. (One can also assume this to be 18, 27, 36 litres etc as each of these are multiples of 9)
Suppose the vessel initially contained 9 litres of liquid. Therefore, there would be 4 litres of water and 5 litres of milk as per the question.
Let x be the litres of liquid replaced with water.
When x litres of composite liquid is removed, \(\frac{4x}{9}\) liters of water would had got removed and \(\frac{5x}{9}\) litres of milk would had got removed. (as the original ratio is given to be 4/5)
Initial quantity of water in liquid = 4
Quantity of water removed = \(\frac{4x}{9}\)
Quantity of water in new mixture = \(4 - \frac{4x}{9} + x\)
Note : we are adding x to the quantity of water in new mixture because the entire new replacement (x) is completely water as well.
Initial quantity of milk in liquid = 5
Quantity of milk removed = \(\frac{5x}{9}\)
Quantity of milk in new mixture = \(5 - \frac{5x}{9}\)
Note : Here we are not adding x as entire replacement x is water and not milk.
But it is given that quantity of milk in new mixture is same as that of water.
Therefore, \(4 - \frac{4x}{9} + x = 5 - \frac{5x}{9}\)
36 - 4x + 9x = 45 - 5x
36 + 5x = 45
10x = 9
x = 9/10.
Ratio of liquid that was removed = removed mixture volume / original mixture volume = \(\frac{9/10}{9} = 1/10\)

**PROBLEMS ON TIME, DISTANCE, SPEED**

260. A tourist from USA wanted to experiment different types of travel. He travelled 1/4 of the distance by car. He travelled by train 50% of the balance left. From out of the present
balance 1/4th was covered by him in his motor cycle. Thereafter he covered the balance of 108 km by boat. What is the total distance travelled by him?

a) 468 km  b) 728 km  c) 546 km  d) 384 km

Answer : d) 384 km

Solution :
1/4 th distance covered by car.
Out of the balance i.e. 3/4 th distance , 50% was covered by train.
i.e. 3/8th of distance was covered by train.
Balance left was 3/8. Out of this 1/4th of distance was covered by motor cycle.
Distance covered by motorcycle = 3/8 x 1/4 th of distance = 3/32 th of distance.
Remaining Distance left out for boat = 3/8 - 3/32 = 9/32 = 9/32 th of distance
This portion 9/32 was covered by him in boat which is given as 108 km
Let total distance be D. Then 9/32 x D = 108. Or D = 384 km.

261. A tourist company arranged 3/7th of total travel by train. Of the balance half the distance was covered by Volvo luxury bus. The balance distance of 70 km was covered by call taxi. What is the total distance of travel arranged by the tourist company?

a) 145 km  b) 245 km  c) 345 km  d) 445 km

Answer : b) 245 km

Solution :
3/7th of distance covered by train , Balance - 4/7 th of distance
Out of 4/7 th balance , 1/2 th of distance was covered by luxury bus.
i.e.4/14 th of distance was covered by luxury bus. Balance left = 4/14 = 2/7 th of distance
This 2/7th of distance is covered by call taxi i.e. 70 km
Let total distance be D. Then 2/7 x D = 245. Or D = 245 km

262. An enterprising traveller covered 22% of the total distance by race car. Out of the balance he covered 50% by train. Now with the remaining balance he covered half of it by motor cycle and the balance of 156 km by cycle. What is the total distance travelled by him?

A) 600 km  b) 900 km  c) 700 km  d) 800 km

Answer : d) 800 km

Solution :
By race car he travelled 22% of total distance
Balance distance to cover is 78% and out of this 1/2 that is 39% is covered by train.
In the remaining 50% i.e. 39% , he had covered half by motor cycle i.e. 19.5% of the distance.
Distance covered by cycle is 156 km which is the remaining 19.5% of the distance.
Hence 19.5% covers 156 km , then for 100% i.e. 15600 / 19.5 = 800
The total distance travelled will be 800 km

263. A man can row 5 kmph in still water. If the river is running at 1kmph, it takes him 75 minutes to row to a place and back. How far is the place?

(i) 3km  (ii) 2.5 km
(iii) 4 km  
(iv) 5 km

Solution:
Speed downstream = (5+1)km/hr = 6 km/hr  
Speed upstream = (5-1)km/hr = 4 km/hr  
Let the required distance be x km  
\[
x/6 + x/4 = 75/60
\]
\[
2x + 3x = 15
\]
\[
x = 3 km
\]

263. 729 ml of a mixture contains milk and water in ratio 7:2. How much of the water is to be added to get a new mixture containing half milk and half water?
(i) 79 ml  
(ii) 81 ml  
(iii) 72 ml  
(iv) 91 ml

Solution:
Milk = (729 * (7/9)) = 567ml  
Water = (729-567) = 162ml  
Let water to be added be x ml  
\[
567/(162+x) = 7/3
\]
\[
1701 = 1134 + 7x
\]
\[
x = 81ml
\]

264. If log 0.317=0.3332 and log 0.318=0.3364 then find log 0.319?
(i) 0.3396  
(ii) 0.3369  
(iii) 0.3368  
(iv) 0.3338

Solution: log 0.317=0.3332 and log 0.318=0.3364, then
\[
\text{log 0.319= log0.318+(log(0.318-0.317))} = 0.3396
\]

265. A box of 150 packets consists of 1kg packets and 2kg packets. Total weight of box is 264kg. How many 2kg packets are there?
(i) 36  
(ii) 114  
(iii) 120  
(iv) 50

Solution:
x= 2 kg Packs  
y= 1 kg packs  
x + y = 150 ......... Eqn 1  
2x + y = 264 ......... Eqn 2  
Solve the Simultaneous equation; x = 114  
so, y = 36  
ANS : Number of 2 kg Packs = 114.

PROBLEMS ON AVERAGE

266. The average weight of a class of 30 students is 40 kgs. If the teacher's weight is included then average increases by 2 kgs. Find the weight of the teacher?
a) 102  
b) 100  
c) 98  
Answer is 102

267. In a group the average income of 6 men is 500 and that of 5 women is 280, then what is average income of the group?  
a) 400  
b) 100  
c) 200  
Answer is 400

268. The average marks of a student in 4 Examination is 40. If he got 80 marks in 5th Exam then what is his new average?  
a) 48  
b) 84  
c) 40  
Answer is 48

269. Find the average of first 50 natural numbers.  
a) 16  
b) 15.5  
c) 14  
Answer is 15.5

270. Find the average height of five students with heights 142, 147, 153, 165, 157 in cms?  
a) 152  
b) 152.2  
c) 152.4  
d) 152.8  
Answer is 152.8

271. The average marks of girls in a class is 62.5. The average marksof 4 girls among them is 60. The average marks of remaining girls is 63, then what is the number of girls in the class?  
a) 11  
b) 10  
c) 9  
Answer is 10

272. The average price of 10 books is increased by 17 Rupees when one of them whose value is Rs. 400 is replaced by a new book. What is the price of new book?  
a) 570  
b) 750  
c) 600  
Answer is 570
273. The average age of Mr and Mrs Sharma 4 years ago is 28 years. If the present average age of Mr and Mrs Sharma and their son is 22 years. What is the age of their son?

a) 2
b) 1
c) 4

Answer is 2

PROBLEMS ON WORK AND TIME

274. “Hunterkey” a leading software company situate in China was started in the year 1988. The company had been progressing well since inception and the company has achieved a turnover of over 10 billion $. The management of the company has plans for achieving greater heights in terms of turnover and has been training its members in various skills such as technical skills, soft skills, programming skills etc. 60 programmers of the company write 60 lines of programs in 60 minutes totally. How long will it take for 84 programmers to write 84 lines of programs?

a) 84 min. b) 48 min c) 60 min d) 72 min

Answer: c) 60 min.

Solution:
For problems like this where efficiency of the programmers/workers are assumed constant implicitly, you can apply the below formula

\[ \frac{P_1 \times M_1}{L_1} = \frac{P_2 \times M_2}{L_2} \]

Here, \( P_1, M_1 \) and \( L_1 \) are number of programmers, number of minutes and number of lines respectively in case I

And, \( P_2, M_2 \) and \( L_2 \) are number of programmers, number of minutes and number of lines respectively in case II.

Given \( P_1 = 60, M_1 = 60, L_1 = 60, P_2 = 84, L_2 = 84. \)

Substituting in above formula we get.

\[ 60 \times 60 / 60 = 84 \times M_2 / 84. \]

Simplifying we get, \( M_2 = 60 \) minutes.

275. “Universal Software Inc.” USA is situated in California. The company was started in the year 1975 and has been progressing extremely well. It is aiming to reach the topmost position in the near future. During the year 2010, in a team, on any particular day, 48 programmers of the company were able to write 48 lines of software programs in 48 minutes. The company recruits 72 more programmers. Also the team management improves the throughput by making them to work for 72 more minutes every day. What will be the increase of the number of lines of code possible now?

a) 300 lines b) 252 lines c) 48 lines d) 48 lines

Answer: b) 252 lines

Solution:
Using the same formula as in first question:

\[ \frac{P_1 \times M_1}{L_1} = \frac{P_2 \times M_2}{L_2} \]

Given, \( P_1 = 48, M_1 = 48 \) and \( L_1 = 48 \)

Given \( P_2 = P_1 + 72 = 48 + 72 = 120 \)
Given M2 = M1 + 72 = 48 + 72 = 120
Substituting values in formula we get,
48 x 48 / 48 = 120 x 120 / L2
Simplifying we get L2 = 300
Increase in number of lines of code = L2 - L1 = 300 - 48 = 252

276. “Extremely fast solutions” a software programmer provider has been training its manpower in such a way that 36 programmers could write 36 software programs of similar nature in 36 hours. The company has received an order for getting 84 software programs of similar nature in 24 hours. How many additional programmers should the company employ for this project?
a) 90 b)42 c)66 d)44
Answer : a) 90

Solution :
Using the same formula as in first question (Note : M1 and M2 denote time in hours and not minutes. Left hand side and Right hand side should have same units and thats the deal.)
P1 X M1 / L1 = P2 X M2 / L2
Given P1 = 36, M1 = 36, L1 = 36.
Given L2 = 84, M2 = 24
Substituting we get,
36 x 36 / 36 = P2 x 24 / 84
Or P2 = 36 x 84 / 24 = 126
Number of additional programmers = P2 - P1 = 126 - 36 = 90.

277. A company has three staff members working in communications department. They are Peter, Satish and Raju. The company has received a work of sending communication to its potential customers. The time the three take to complete the dispatch work together is 2 days less than Peter would have taken to do it alone, 10 days less than Satish to do the work alone and one-third of the time that Raju would have taken working alone. How many days will the three people take to do the dispatch of all the mails working together?
a) 2 days b) 4 days c) 5 days d) 3 days
Answer : a) 2 days.

Solution :
Let the number of letters to be dispatched be X.
If the three people together take ‘D’ days to complete the work then
Peter will take (D +2) days to complete it alone.
Satish will take (D + 10) days to complete it alone.
And Raju will take 3 D days to complete it alone.
Speed of Peter --- X / (D+2) letters per day
Speed of Satish -- X / (D + 10) letters per day
Speed of Raju -- X / 3D letters per day
All of them working together for one day will dispatch –
X/(D+2) + X/(D+10) + X/3D letters -> eq 1
Number of days it will take for them to complete the dispatch of all the X letters = X / [ X/D+2 + X/D+10 + X/3D]
But we had assumed the number of days to dispatch all X letters as D.
Therefore, $D = X / [(X/D+2) + (X/D+10) + (X/3D)]$

Or $X/D = (X /D+2) + (X/D+10) + (X/3D)$

Or $1/(D+2) + 1/(D+10) + 1/ 3D = 1 /D$

Substituting the options one by one, we can find that $D = 2$ satisfies the equation.

i.e Substitute $D = 2$ in both sides of $1/(D+2) + 1/(D+10) + 1/ 3D = 1 /D$.

Substituting $D = 2$ On LHS : $1/4 + 1/12 + 1/6 = 6/12 = 1/2$

On RHS $D = 2$ we get $1/2$

Therefore, LHS = RHS when $D =2$ and hence 2 is the right answer.

278. Roja and Edward were working in a courier company. Roja takes 6 hours to pack 32 parcels while Edward takes 5 hours to pack 40 parcels. How long they will take to pack 330 parcels working together?

a) 24 hours 45 minutes  b) 23 hours  c) 25 hours 15 minutes  d) none of these.

Answer : c) 25 hours 15 minutes

Solution :

Speed of Roja per hour = $32/6$ parcels

Speed of Edward per hour = $40/5 = 8$ parcels

When both of them work together in one hour they will pack $32/6 + 8 = 13 \frac{1}{3}$ parcels

For packing 330 parcels it will take $330 / 13 \frac{1}{3} = 25$ hours 15 minutes

279. An overseas software company entrusted the work to a company in India. The Indian company conducted campus recruitment drives and recruited men and women on a large scale. It gave training to newcomers in its training centre with advanced facilities at Mysore for over three weeks. The company conducted periodical tests to assess the progress in terms of knowledge and output of its employees in order to ensure uniform output being given by all the employees. Company’s 48 programmers wrote 48 lines of program in 36 minutes. How many programmers are required to write 192 lines program in 24 minutes.?

a) 24  b) 36  c) 288  d) 72

Answer : c) 288

Solution :

<table>
<thead>
<tr>
<th>Programmers</th>
<th>Lines</th>
<th>Minutes</th>
</tr>
</thead>
<tbody>
<tr>
<td>48</td>
<td>48</td>
<td>36</td>
</tr>
<tr>
<td>?</td>
<td>192</td>
<td>24</td>
</tr>
</tbody>
</table>

For such problems where efficiency of programmers are considered to be the same, one can employ the equation

$P_1 \times M_1 / L_1 = P_2 \times M_2 / L_2 \Rightarrow eq 1$

Where $P_1$, $M_1$ and $L_1$ are the number of programmers, minutes and lines of code respectively in I case and $P_2$, $M_2$ and $L_2$ are the number of programmers, minutes and lines of code respectively in II case.

From the question, we can find that $P_1 = 48$, $M_1 = 36$, $L_1 = 48$, $M_2 = 24$ and $L_2 = 192$. $P_2$ is to be found out.

Substituting the above values in equation 1 we get,

144
\[
\frac{48 \times 36}{48} = (P2 \times 24)/192 \\
\text{Or, } P2 = \frac{(48 \times 36 \times 192)}{(48 \times 24)} = 288
\]

**PROBLEMS ON GAIN/LOSS USING TIME ON HAND CLOCK**

280. Priya was presented with new brand watch, as marriage anniversary gift by her husband. She observed, that the two hands of the new watch coincide every 64 minutes. She was trying to calculate, how many minutes the watch will lose per day. Can you guide Priya?

(a) 32 \frac{8}{11} (b) 36 \frac{5}{11} (c) 90 minutes (d) 96 minutes

**Answer:** a) 32 \frac{8}{11}

**Solution:**

55 min spaces are gained by minute hand (with respect to hour hand) in 60 min. (In 60 minutes, hour hand will move 5 spaces while the minute hand will move 60 spaces. In effect the space gain of minute hand with respect to hour hand will be 60 - 5 = 55 minutes.)

In 60 min it will gain,

\[\frac{60}{55} \times 60 = 65 \frac{5}{11} \text{ min.}\]

But minute hand of Priya's watch gains only 64 minutes (it is slow than normal)

Actual loss = 65 \frac{5}{11} - 64 = 1 \frac{5}{11} = 16/11 \text{ min}

In 64 min. the loss is 16/11 min

In 24 hours the loss is = \(\frac{16}{11} \times \frac{1}{64} \times 24 \times 60\) min = 32 \frac{8}{11} minutes.

281. It was 4’o clock in the evening. Shilu was staring at the new watch that was presented by her Dad two day's ago. She was trying to measure the exact time between 4 and 5’o clock during which the hands of the watch point in opposite directions forming a straight line. What would be that time?

(a) 45 minutes past 4 (b) 40 minutes past 4 (c) 50 \frac{4}{11} minutes past 4 (d) 54 \frac{6}{11} minutes past 4.

**Answer:** d) 54 \frac{6}{11} minutes past 4.

**Solution:**

At 4’o clock the hands are 20 minutes apart. To form a straight line in opposite direction the hands must be in 30 minutes apart. To accomplish this the minute hand have to close up the 20 minutes separation and after crossing the hour hand it has to gain 30 minute separation. In total minute hand will have to gain 20 + 30 = 50 minutes spaces apart.

55 min spaces are gained in 60 min. (In 60 minutes, hour hand will move 5 spaces while the minute hand will move 60 spaces. In effect the space gain of minute hand with respect to hour hand will be 60 - 5 = 55 minutes.)

50 min spaces can be gained in \(\frac{60}{55} \times 50 = 54 \frac{6}{11}\) minutes.

Hence the answer is 54 \frac{6}{11} minutes past 4.

282. The famous church in the city of Kumbakonnam has a big clock tower and is said to be over 300 years old. Every Monday 10.00 A M the clock is set by Antony, doing service in the church. The Clock loses 6 mins every hour. What will be the actual time when the faulty clock shows 3 P.M on Friday?

(a) 4 A.M (b) 3.16 P.M. (c) 4.54 A.M. (d) 3 A.M

**Answer:** c) 4.54 A.M
Solution:
Total hours from Monday 10.00 AM to Friday 3.00 PM = 101 HOURS
The clock loses 6 minutes every hour. In 101 hours it will lose 101 x 6 = 606 minutes. ie 10 hours 06 minutes.
To find the actual time, calculate 10 hours 6 min backwards from Friday 3.00 PM which is 4.54 AM
Hence the actual time would be 4.54 AM when clock shows 3.00 PM on Friday.

PROBLEMS DEALING WORK EFFICIENCY

283. Brilliant software company, Chennai has been doing an excellent business in the last four years. The company went on a recruitment spree from among the engineering colleges in and around Chennai. They recruited people from ECE, CSE, IT streams. All programmers are of equal respect. They receive equal salaries and perform equal load of work. Suppose 15 such programmers take 15 minutes to write 15 lines of code in total. How long will it take for 84 programmers to write 84 lines of code in total?

a) 84 minutes  
b) 15 minutes  
c) 27 minutes  
d) 30 minutes
Answer : b) 15 minutes

Solution:
For such problems where efficiency of the workers are alike, we can use the below equation :

\[ P_1 \times M_1 / L_1 = P_2 \times M_2 / L_2 \] ...(1)

In the above formula, P1 and P2 represent number of programmers in I and II scenarios respectively ; M1 and M2 minutes required for completion of work in I and II scenarios respectively and L1 and L2 represent number of lines of code in I and II scenarios respectively.

Given values : P1 = 15, L1 = 15, M1 = 15, P2 = 84, L2 = 84. We have to find M2

Applying given values in equation 1 we get,

\[ 15 \times 15 / 15 = 84 \times M_2 / 84 \]

Simplifying we get, \[ M_2 = 15 \] minutes which is our answer.

284. One of the leading software companies recruited boys and girls from different engineering colleges. They were given training in software program writing for three weeks in the company’s fully equipped modern training centre. All of the employees developed similar skills, abilities and were paid equal salary. How many programmers would be required to write 48 lines of code in twice the time that would be consumed 12 programmers to write 12 lines of code?

a) 12  
b) 24  
c) 15  
d) 10
Answer : b) 24 programmers

Solution :
Given Values : L1 = 48, P2 = 12 and L2 = 12
Also from question it is clear that time taken in scenario 1 will be twice that in scenario 2. Therefore, M1 = 2M2
Substituting the values in our familiar equation (ref solution for question 1)

\[ P_1 \times M_2 / 48 = 12 \times M_2 / 12 \]
P1/24 = 1
Or P1 = 24 programmers.

285. M/s. Compaware software systems had a revenue of US $ 747 million during the last year. It was in 34th position among the leading software companies. The company wanted to improve its business position and ranking and hence recruited 600 programmers afresh and gave them intensive training in software code line writing. After the training was completed all the programmers attain similar level of expertise in writing of software code lines and hence they were paid similar salary. Supposing 108 programmers can write 108 lines of software code in 108 minutes, 72 programmers will write how many lines of software code in 72 minutes?
a) 108 b) 60 c) 72 d) 48
Answer : d) 48

Solution :
Given Values : P1 = 108, M1 = 108, L1 = 108, P2 = 72, M2 = 72
Applying these values in our familiar equation (ref solution of question 1) we get :
108 X 108 / 108 = 72 x 72 / L2
L2 = 72 x 72 / 108 = 48 lines

PROBLEMS BASED ON DIVISIBILITY OF NUMBERS

286. Mylapore Times a local free newspaper conducted a test for students studying in corporation schools falling within the jurisdiction of Chennai. The test was aimed at ascertaining the level of mathematics knowledge among the school students. The following question was given :
“How many numbers are there between 133 to 294 both included, which are divisible by 7?”
a) 23 b) 24 c) 26 d) none of these.
Answer : b) 24.

Solution :
In this problem both the boundary numbers 133 and 294 are divisible by 7. Also the boundary numbers are inclusive for calculation. In such scenarios solving is very simple. Quotient 1 (when upper boundary number is divided by the divisor, in our case 7) : When 294 is divided by 7 we get 42. (1)
Quotient 2 (when lower boundary number is divided by the divisor, in our case 7) : When 133 is divided by 7 we get 19.(2)
Answer can be obtained using the formula, Quotient 1 - Quotient 2 + 1 = 42 - 19 + 1 = 24
294 - 133 = 23 + 1 = 24

287. Porur Times is a newspaper which is distributed free to residents in and near Porur. It carries advertisement on different aspects such as rental, real estate, tuition, business deals etc. Porur Times gave a puzzle and wanted answers to be emailed to them within a day. The question read as under:
“How many three digit numbers can be formed using the digits 1,2,3,4,5 (but with repetition) that are divisible by 4?”
a) 12 b) 20 c) 60 d) 10
Answer : b) 20

Solution :
To solve this problem, we are going to utilize the simple rule that for a number to be divisible by 4, its last two digits must be divisible by 4.
Using digits present in 1,2,3,4,5 the two digit combination's that are divisible by 4 include 12, 24, 32, 44
Now placing any of the digits from 1,2,3,4,5 before the 2 digit numbers that we arrived in previous step, we can actually find the total number of 3 digit numbers formed from 1,2,3,4,5 that are divisible by 4.
They are,
112, 124, 132, 144
212, 224, 232, 244
312, 324, 332, 344
412, 424, 432, 444
512, 524, 532, 544
Therefore there are 20 numbers which is our answer.

288. Kumaresh attended a placement examination online and the following question was posed to him:
“ The difference between the squares of two consecutive odd integers is always divisible by” which of the following:
a) 6 b) 8 c) 7 d) 3
Answer : b) 8

Let the two consecutive odd integers be (2x + 1) and (2x + 3).
Then, (2x + 3)² - (2x +1)²
4x² + 12x + 9 - 4x² - 4x -1 = 8x + 8 = 8(x +1).
Now for any value of x, 8(x +1). is divisible by 8. Therefore, answer is 8.
3. APTITUDE
APTITUDE QUESTIONS WITH ANSWERS

1: The largest copper producing country in the World is

1. Chile
2. Russia
3. South Africa
4. China

Ans: 1.

2: If the radius of a circle is diminished by 10%, then its area is diminished by:

1. 10%
2. 19%
3. 20%
4. 36%

Ans: 2.

3: A boat travels 20 kms upstream in 6 hrs and 18 kms downstream in 4 hrs. Find the speed of the boat in still water and the speed of the water current?

1. 1/2 kmph
2. 7/12 kmph
3. 5 kmph
4. none of these

Ans: 2.
4: At what time after 4.00 p.m. is the minutes hand of a clock exactly aligned with the hour hand?

1. 4:21:49.5
2. 4:27:49.5
3. 3:21:49.5
4. 4:21:44.5

Ans: 1.

5: A shop keeper sold a T.V set for Rs.17,940 with a discount of 8% and earned a profit of 19.6%. What would have been the percentage of profit earned if no discount was offered?

1. 24.8%
2. 25%
3. 26.4%
4. Cannot be determined
5. None of these

Ans: 5.

6: If (2x - y) = 4 then (6x - 3y) = ?

1. 15
2. 12
3. 18
4. 10

Ans: 2.

7: A clock is set right at 8 a.m. The clock gains 10 minutes in 24 hours. What will be the true time when the clock indicates 1 p.m. on the following day?

1. 48 min. past 12
2. 38 min. past 12
3. 28 min. past 12
4. 25 min. past 12

Ans: 1.
8: What is the missing number in this series? 8 2 14 6 11 ? 14 6 18 12

1. 16
2. 9
3. 15
4. 6

Ans: 2.

9: Dinesh travelled 1200 km by air which formed 2/5 of his trip. One third of the whole trip, he travelled by car and the rest of the journey he performed by train. What was the distance travelled by train?

1. 600Km
2. 700Km
3. 800Km
4. 900Km

Ans: 3.

10: A train which travels at a uniform speed due to some mechanical fault after traveling for an hour goes at 3/5th of the original speed and reaches the destination 2 hrs late. If the fault had occurred after traveling another 50 miles the train would have reached 40 min earlier. What is distance between the two stations.

1. 300
2. 310
3. 320
4. 305

Ans: 1.

11: The average between a two digit number and the number obtained by interchanging the digits is 9. What is the difference between the two digits of the number?

1. 8
2. 2
3. 5
4. Cannot be determined
12: Pipe A can fill in 20 minutes and Pipe B in 30 mins and Pipe C can empty the same in 40 mins. If all of them work together, find the time taken to fill the tank

1. 17 1/7 mins
2. 20 mins
3. 8 mins
4. none of these

Ans: 1.

13: A person has 4 coins each of different denomination. What is the number of different sums of money the person can form (using one or more coins at a time)?

1. 16
2. 15
3. 12
4. 11

Ans: 2.

14: The simple interest on a certain sum of money for 3 years is 225 and the compound interest on the same sum at the same rate for 2 years is 153 then the principal invested is

1. 1500
2. 2250
3. 3000
4. 1875

Ans: 4.

15: A cow is tethered in the middle of a field with a 14 feet long rope. If the cow grazes 100 sq. ft. per day, then approximately what time will be taken by the cow to graze the whole field?

1. 2 days
2. 6 days
3. 18 days

Ans: 4.
4. 24 days
5. None of these
Ans: 2.

16: 2 hours after a freight train leaves Delhi a passenger train leaves the same station travelling in the same direction at an average speed of 16 km/hr. After travelling 4 hrs the passenger train overtakes the freight train. The average speed of the freight train was?
1. 40
2. 30
3. 80
4. 60
Ans: 1.

17: The two colors seen at the extreme ends of the pH chart are:
1. Red and Blue
2. Red and Green
3. Green and Blue
4. Orange and Green
Ans: 1.

18: 8 15 24 35 48 63 _?
1. 70
2. 80
3. 75
4. 88
Ans: 2.

19: One of Mr. Horton, his wife, their son, and Mr. Horton’s mother is a doctor and another is a lawyer.
a) If the doctor is younger than the lawyer, then the doctor and the lawyer are not blood relatives.
b) If the doctor is a woman, then the doctor and the lawyer are blood relatives.
c) If the lawyer is a man, then the doctor is a man. Whose occupation you know?
1. Mr. Horton: he is the doctor
2. Mr. Horton’s son: she is the lawyer
3. Mr. Horton: he is the doctor
4. Mr. Horton’s mother: she is the doctor

Ans: 1.

20: In the given figure, PA and PB are tangents to the circle at A and B respectively and the chord BC is parallel to tangent PA. If AC = 6 cm, and length of the tangent AP is 9 cm, then what is the length of the chord BC?

1. 4 cm
2. 8 cm
3. 6 cm
4. 5 cm

Ans: 1.

21: Union Information and Broadcasting ministry recently gave an indication to change which of the following laws on a larger scale, as the existing provisions of the Act are inadequate to cater to the phenomenal growth of the print media in view of the liberalization of the government policies?

1. Press & Registration of Books Act, (PRB Act) 1867
2. The Delivery Of Books ‘And Newspapers’ (Public Libraries) Act, 1954
3. Indian Press (Emergency Powers ) Act 1931
4. none

Ans: 1.

22: 2 numbers differ by 5. If their product is 336, then the sum of the 2 numbers is:

1. 21
2. 51
3. 28
4. 37

Ans: 4.

23: Which number is the odd one out? 9678 4572 5261 3527 7768
24: Which one among the following has the largest shipyard in India

1. Kolkata
2. Kochi
3. Mumbai
4. Visakhapatnam

Ans: 2.

25: If \( x = y = 2z \) and \( xyz = 256 \) then what is the value of \( x \)?

1. 8
2. 3
3. 5
4. 6

Ans: 1.

26: A radio when sold at a certain price gives a gain of 20%. What will be the gain percent, if sold for thrice the price?

1. 280
2. 270
3. 290
4. 260

Ans: 4.

27: \( x \% \) of \( y \) is \( y \% \) of ?

1. \( x/y \)
2. \( 2y \)
3. x
4. can’t be determined

Ans: 3.

28: If the value of x lies between 0 & 1 which of the following is the largest?

1. x
2. x^2
3. -x
4. 1/x

Ans: 4.

29: The tutor of Alexander the great was

1. Darius
2. Cyrus
3. Socrates
4. Aristotle

Ans: 4.

30: Thirty men take 20 days to complete a job working 9 hours a day. How many hour a day should 40 men work to complete the job?

1. 8 hrs
2. 71/2 hrs
3. 7 hrs
4. 9 hrs

Ans: 2.

31: Goitre caused by the deficiency of ........

1. Vitamin D
2. Iron
3. Vitamin A
4. Iodine

Ans: 4.
32: Who invented Napier’s Bones

1. John Napier
2. William Oughtred
3. Charles Babbage
4. Napier Bone

Ans: 1.

33: The mass number of a nucleus is

1. Always less than its atomic number
2. Always more than its atomic number
3. Sometimes more than and sometimes equal to its atomic number
4. None of the above

Ans: 3.

34: A and B can do a piece of work in 45 days and 40 days respectively. They began to do the work together but A leaves after some days and then B completed the remaining work in 23 days. The number of days after which A left the work was

1. 9
2. 11
3. 12
4. 15
5. 16

Ans: 1.

35: Sam and Mala have a conversation. Sam says I am certainly not over 40 Mala Says I am 38 and you are at least 5 years older than me · Now Sam says you are at least 39 all the statements by the two are false. How old are they really?

1. Mala = 38 yrs, Sam =31 yrs.
2. Mala = 38 yrs, Sam = 41 yrs
3. Mala = 31 yrs, Sam = 41 yrs.
4. Mala = 45yrs, Sam = 41 yrs

Ans: 2.
36: What is the code name for Windows Vista?

1. Longhorn
2. Longhund
3. Stackspray
4. Pearl

Ans: 1.

37: On sports day, if 30 children were made to stand in a column, 16 columns could be formed. If 24 children were made to stand in a column, how many columns could be formed?

1. 20
2. 30
3. 40
4. 50

Ans: 1.

38: The probability that a man will be alive for 25 years is \( \frac{3}{5} \) and the probability that his wife will be alive for 25 years is \( \frac{2}{3} \). Find the probability that only the man will be alive for 25 years.

1. \( \frac{2}{5} \)
2. \( \frac{1}{5} \)
3. \( \frac{3}{5} \)
4. \( \frac{4}{5} \)

Ans: 2.

39: In a single throw of a dice, what is the probability of getting a number greater than 4?

1. \( \frac{1}{2} \)
2. \( \frac{2}{3} \)
3. \( \frac{1}{4} \)
4. \( \frac{1}{3} \)

Ans: 4.
40: If every alternative letter starting from B of the English alphabet is written in small letter, rest all are written in capital letters, how the month “September” be written. (1) SeptEMbEr (2) SEpTeMBEr (3) SeptembeR (4) SepteMber (5) None of the above

1. (1)
2. (2)
3. (3)
4. (5)
5. (4)

Ans: 4.

41: After allowing a discount of 11.11% ,a trader still makes a gain of 14.28 % .at how many precent above the cost price does he mark his goods?

1. 28.56%
2. 35%
3. 22.22%
4. None of these

Ans: 1.

42: Pipe A can fill in 20 minutes and Pipe B in 30 mins and Pipe C can empty the same in 40 mins.If all of them work together, find the time taken to fill the tank

1. 17 1/7 mins
2. 20 mins
3. none
4. 50 mins

Ans: 1.

43: There are 3 triplet brothers. They look identical. The oldest is John, he always tells the truth. The second is Jack, he always tells a lie. The third is Joe, he either tells the truth or a lie. Jimmie Dean went to visit them one day. He was wondering who was who. So he asked each person a question. He asked the one who was sitting on the left: “Who is the guy sitting in the middle?”. The answer was “He is John.” He asked the one who was sitting in the middle: “What is your name?”. The answer was “I am Joe.” He asked the one who was sitting on the right: “What is the guy sitting in the
middle?”. The answer was “He is Jack.” Jimmie Dean got really confused. Basically, he asked 3 same questions, but he got 3 different answers. which is not true?

1. left most is joe
2. middle is jack
3. right is john
4. middle is john

Ans: 4.

44: A / B = C; C > D then

1. A is always greater than D
2. C is always greater than D
3. B is always less than D
4. none

Ans: 1.

45: Consider the following statements: 1. The Administrative Reforms Commission (ARC) had recommended that the Department of Personnel of a State should be put under the charge of the Chief Secretary of the State. 2. Chief Secretary of a State is not involved in any manner in the promotion of State Civil officers to the All-India Services. Which of the statements given above is/are correct?

1. Only 1
2. Only 2
3. Both 1 and 2
4. Neither 1 nor 2

Ans: 1.

46: The population of a town was 1,60,000 three years ago. If it increased by 3%, 2.5% and 5% respectively in the last three years, then the present population of the town is :

1. 1,77,000
2. 1,77,366
3. 1,77,461
4. 1,77,596

Ans: 2.
47: What is the population of India?

1. 98 crores
2. More than 2 billion
3. More than 1 billion
4. Less than 96 crores
5. 96 crores

Ans: 3.

48: Some green are blue. No blue are white.

1. Some green are white
2. No white are green
3. No green are white
4. None of the above

Ans: 1.

49: What is the missing number in this series? 8 2 14 6 11 ? 14 6 18 12

1. 8
2. 6
3. 9
4. 11

Ans: 3.

50: Average age of students of an adult school is 40 years. 120 new students whose average age is 32 years joined the school. As a result the average age is decreased by 4 years. Find the number of students of the school after joining of the new students:

1. 1200
2. 120
3. 360
4. 240

Ans: 4.
51: On sports day, if 30 children were made to stand in a column, 16 columns could be formed. If 24 children were made to stand in a column, how many columns could be formed?

1. 48
2. 20
3. 30
4. 16
5. 40

Ans: 2.

52: Which of the following numbers is divisible by 3? (i) 541326 (ii) 5967013

1. (ii) only
2. (i) only
3. (i) and (ii) both
4. (i) and (ii) none

Ans: 2.

53: A square is divided into 9 identical smaller squares. Six identical balls are to be placed in these smaller squares such that each of the three rows gets at least one ball (one ball in one square only). In how many different ways can this be done?

1. 81
2. 91
3. 41
4. 51

Ans: 1.

54: A man owns 2/3 of the market research bureau business and sells 3/4 of his shares for Rs.75000. What is the value of Business

1. 150000
2. 13000
3. 240000
4. 34000

Ans: 1.
55: 1, 2, 6, 24, _?

1. 111
2. 151
3. 120
4. 125

Ans: 3.

56: The cost of 16 packets of salt, each weighing 900 grams is Rs. 28. What will be the cost of 27 packets, if each packet weighs 1Kg?

1. Rs. 52.50
2. Rs. 56
3. Rs. 58.50
4. Rs. 64.75

Ans: 1.

57: Ronald and Michelle have two children. The probability that the first child is a girl, is 50%. The probability that the second child is a girl, is also 50%. Ronald and Michelle tell you that they have a daughter. What is the probability that their other child is also a girl?

1. 1/2
2. 1/3
3. 1/4
4. 1/5

Ans: 2.

58: Find the value of \((21/4 - 1)(23/4 + 21/2 + 21/4 + 1)\)

1. 1
2. 2
3. 3

Ans: 1.

59: The product of two fractions is \(14/15\) and their quotient is \(35/24\). The greater fraction is
1. 4/5
2. 7/6
3. 7/5
4. 7/4

Ans: 1.

60: 500 men are arranged in an array of 10 rows and 50 columns according to their heights. Tallest among each row of all are asked to fall out. And the shortest among them is A. Similarly after resuming that to their original positions that the shortest among each column are asked to fall out. And the tallest among them is B. Now who is taller among A and B?

1. A
2. B
3. Both are of same height

Ans: 1.

61: Choose the pair of numbers which comes next 75 65 85 55 45 85 35

1. 25 15
2. 25 85
3. 35 25
4. 35 85
5. 25 75

Ans: 2.

62: A three digit number consists of 9,5 and one more number. When these digits are reversed and then subtracted from the original number the answer yielded will be consisting of the same digits arranged yet in a different order. What is the other digit?

1. 1
2. 2
3. 3
4. 4

Ans: 4.

63: ATP stands for:
1. Adenine triphosphate
2. Adenosine triphosphate
3. Adenosine Diphosphate
4. Adenosine tetraphosphate

Ans: 2.

64: Veselin Tapolev who became the World Champion recently, is associated with which of the following games/sports?

1. Chess
2. Golf
3. Snooker
4. Badminton
5. None of these

Ans: 1.

65: A piece of cloth cost Rs 35. if the length of the piece would have been 4m longer and each meter cost Re 1 less , the cost would have remained unchanged. how long is the piece?

1. 10
2. 11
3. 12

Ans: 1.

66: In a journey of 15 miles two third distance was travelled with 40 mph and remaining with 60 mph. How much time the journey takes

1. 40 min
2. 30 min
3. 120 min
4. 20 min

Ans: 4.

67: Solid cube of 6 * 6 * 6. This cube is cut into to 216 small cubes. (1 * 1 * 1).the big cube is painted in all its faces. Then how many of cubes are painted at least 2 sides.
68: Find the average of first 40 natural numbers.

1. 40
2. 35
3. 30.6
4. 20.5
5. None of these

Ans: 4.

69: 1, 5, 14, 30, ?, 91

1. 45
2. 55
3. 60
4. 70
5. None of these

Ans: 2.

70: There is a shortage of tubelights, bulbs and fans in a village – Gurgaon. It is found that

a) All houses do not have either tubelight or bulb or fan.
b) Exactly 19% of houses do not have just one of these.
c) Atleast 67% of houses do not have tubelights.
d) Atleast 83% of houses do not have bulbs.
e) Atleast 73% of houses do not have fans.

1. 42 %
2. 46 %
3. 50 %
4. 54 %
5. 57 %
71: If 9 engines consume 24 metric tonnes of coal, when each is working 8 hours a day; how much coal will be required for 8 engines, each running 13 hours a day, it being given that 3 engines of the former type consume as much as 4 engines of latter type.

1. 22 metric tonnes.
2. 27 metric tonnes.
3. 26 metric tonnes.
4. 25 metric tonnes.

Ans: 3.

72: To 15 lts of water containing 20% alcohol, we add 5 lts of pure water. What is % alcohol.

1. 20%
2. 34%
3. 15%
4. 14%

Ans: 3.

73: In page preview mode:

1. You can see all pages of your document
2. You can only see the page you are currently working
3. Satyam BPO Services
4. You can only see pages that do not contain graphics

Ans: 4.

74: A house wife saved Rs. 2.50 in buying an item on sale. If she spent Rs.25 for the item, approximately how much percent she saved in the transaction?

1. 8%
2. 9%
3. 10%
4. 11%

Ans: 2.
75: I have trouble _____.

1. to remember my password
2. to remembering my password
3. remember my password
4. remembering my password

Ans: 4.

76: Superheroes Liza and Tamar leave the same camp and run in opposite directions. Liza runs 1 mile per second (mps) and Tamar runs 2 mps. How far apart are they in miles after 1 hour?

1. 10800 mile
2. 19008 mile
3. 12300 mile
4. 14000 mile

Ans: 1.

77: A = 5, B = 0, C = 2, D = 10, E = 2. What is then AB + EE − (ED)^powerB + (AC)^powerE = ?

1. 113
2. 103
3. 93
4. 111

Ans: 2.

78: A man can row upstream at 8 kmph and downstream at 13 kmph. The speed of the stream is?

1. 2.5 kmph
2. 4.2 kmph
3. 5 kmph
4. 10.5 kmph

Ans: 1.
79: Find what is the next letter. Please try to find. O,T,T,F,F,S,S,E,N,_ What is that letter?

1. B
2. S
3. Q
4. T
5. O

Ans: 4.

80: There are 3 societies A, B, C. A lent cars to B and C as many as they had Already. After some time B gave as many tractors to A and C as many as they have. After sometime c did the same thing. At the end of this transaction each one of them had 24. Find the cars each originally had.

1. A had 21 cars, B had 39 cars & C had 12 cars
2. A had 39 cars, B had 39 cars & C had 12 cars
3. A had 39 cars, B had 21 cars & C had 19 cars
4. A had 39 cars, B had 21 cars & C had 12 cars

Ans: 4.

81: A papaya tree was planted 2 years ago. It increases at the rate of 20% every year. If at present, the height of the tree is 540 cm, what was it when the tree was planted?

1. 432 cm
2. 324 cm
3. 375 cm
4. 400 cm

Ans: 3.

82: A boy has Rs 2. He wins or loses Re 1 at a time If he wins he gets Re 1 and if he loses the game he loses Re 1. He can loose only 5 times. He is out of the game if he earns Rs 5. Find the number of ways in which this is possible?

1. 14
2. 23
3. 16
83: Five racing drivers, Alan, Bob, Chris, Don, and Eugene, enter into a contest that consists of 6 races. The results of all six races are listed below: Bob always finishes ahead of Chris. Alan finishes either first or last. Eugene finishes either first or last. There are no ties in any race. Every driver finishes each race. In each race, two points are awarded for a fifth place finish, four points for fourth, six points for third, eight points for second, and ten points for first. If Frank enters the third race and finishes behind Chris and Don, which of the following must be true of that race?

1. Eugene finishes first.
2. Alan finishes sixth.
3. Don finishes second.
4. Frank finishes fifth.
5. Chris finishes third.

Ans: 4.

84: A is twice as good a workman as B and together they finish a piece of work in 18 days. In how many days will A alone finish the work?

1. 27
2. 26
3. 25
4. 24

Ans: 1.

85: Daal is now being sold at Rs. 20 a kg. During last month its rate was Rs. 16 per kg. By how much percent should a family reduce its consumption so as to keep the expenditure fixed?

1. 20 %
2. 40 %
3. 3%
4. 2%

Ans: 3.
86: The sum of 5 successive odd numbers is 1075. What is the largest of these numbers?

1. 215
2. 223
3. 219
4. 217

Ans: 3.

87: A man sells two buffaloes for Rs. 7,820 each. On one he gains 15% and on the other, he loses 15%. His total gain or loss in the transaction is

1. 2.5% gain
2. 2.25% loss
3. 2% loss
4. 5% loss
5. None of these

Ans: 2.

88: One ship goes along the stream direction 28 km and in opposite direction 13 km in 5 hrs for each direction. What is the velocity of stream?

1. 1.5 kmph
2. 2.5 kmph
3. 1.8 kmph
4. 2 kmph

Ans: 1.

89: Which one of the words given below is different from others?

1. Orange
2. Grape
3. Apricot
4. Raspberry
5. Mango
90: Complete the series: 5, 20, 24, 6, 2, 8, ?

1. 12
2. 32
3. 34
4. 36

Ans: 1.

91: A can have a piece of work done in 8 days, B can work three times faster than the A, C can work five times faster than A. How many days will they take to do the work together

1. 3 days
2. 8/9 days
3. 4 days
4. None of the above

Ans: 2.

92: 7 Pink, 5 Black, 11 Yellow balls are there. Minimum no. atleast to get one black and yellow ball

1. 17
2. 13
3. 15
4. 19

Ans: 1.

93: \((\frac{1}{10})^{18} - (\frac{1}{10})^{20}\) = ?

1. 99/1020
2. 99/10
3. 0.9
4. none of these

Ans: 1.
94: Three friends divided some bullets equally. After all of them shot 4 bullets the total number of bullets remaining is equal to the bullets each had after division. Find the original number divided?

1. 18
2. 20
3. 54
4. 8

Ans: 1.

95: A sum of Rs. 427 is to be divided among A, B and C in such a way that 3 times A’s share, 4 times B’s share and 7 times C’s share are all equal. The share of C is

1. Rs.84
2. Rs.76
3. Rs.98
4. Rs.34

Ans: 1.

96: There are 20 poles with a constant distance between each pole. A car takes 24 second to reach the 12th pole. How much will it take to reach the last pole.

1. 41.45 seconds
2. 40.45 seconds
3. 42.45 seconds
4. 41.00 seconds

Ans: 1.

97: An emergency vehicle travels 10 miles at a speed of 50 miles per hour. How fast must the vehicle travel on the return trip if the round-trip travel time is to be 20 minutes?

1. 72 miles per hour
2. 75 miles per hour
3. 65 miles per hour
4. 78 miles per hour

Ans: 2.
98: 12% of 580 + ? = 94

1. 24.4
2. 34.4
3. 54.4
4. 65.4

Ans: 1.

99: There is a certain relation between two given words on one side of : : and one word is given on another side of : : while another word is to be found from the given alternatives, having the same relation with this word as the given pair has. Select the best alternative. Horse : Jockey : : Car : ?

1. Mechanic
2. Chauffeur
3. Steering
4. Brake

Ans: 2.

100: Which of the following numbers should be added to 11158 to make it exactly divisible by 77?

1. 9
2. 8
3. 7
4. 5

Ans: 3.

Question 101

If PREVENTION is coded as DWDSOOSJNO then how will CONTENTION will be coded?

a) DUBPMOSJON b) DUMPBOSJNO c) OSJDUMPBON d) JDMUNOSBOP

Answer : b) DUMPBOSJNO

Reason :
This is actually a bit tough one and would require some application and analysis of options to arrive at the correct one.

The word PREVENTION is first split into two halves PREVE and NTION. In both halves each odd place letter is replaced with the previous letter and each even place letter is replaced with the next letter in alphabet. By doing so the halves would now become OSDWD and OSJNO respectively. Then the first half is reversed while the second half is preserved/kept as it is to arrive at our code DWDSOOSJNO.

By applying the above logic to CONTENTION you can get to the answer DUMPBOSJNO.

**Question 102**

Read the following sentences carefully and answer the below questions:

"Sky is blue" is coded as "tau hok sek"
"Cloud covers sky" is coded as "kef sek raq"

"Its raining" is coded as "hsf awe"

a) What is the code used for sky?

a)sek b)awe c)raq d)hok

**Answer** : a)sek

**Reason** :

These type of questions are easy to answer.

The word sky is occurring in first and second statements. No other word is common between first and second statements. This implies that the code that is common between first and second statements would be the answer. The code 'sek' is common between first and second statements and hence is the answer.

**Question 103**

In a code language SECURITY is coded as CUESTYRI then the code for WATCHMAN is ?

a)TCWAANHM b)TCWANAMH c)TCAWANHM d)TAWCHANM

**Answer** : c)TCAWANHM

**Reason** :

Let us check how SECURITY would had got its code CUESTYRI.
The word SECURITY is split into two halves SECU and RITY. 

Now SECU is further split into SE and CU. Letters of first sub half SE is reversed. Then the halves are switched places to get CUES. ...(1)

Similarly the second half RITY is split into RI and TY. Now, the halves are just switched to get TYRI....(2)

Combining 1 and 2 we get CUESTYRI. This is how the code for SECURITY is arrived.

Applying similar logic to WATCHMAN we can get the answer TCAWANHM.

Question 104

The exciting super final IPL match between Chennai Superkings and Delhi Daredevils was about to start. The thrill and excitement of the fans were shadowed by the forecast that it may rain. Before match it was predicted that the probability of rain was 40%. If it rained, the Chennai Superkings had a 30% chance of winning. If it did not rain, the Chennai Superkings had a 55% chance of winning. If you are asked to calculate the overall probability of Chennai winning the match what will be your answer ?

(a)58% (b)45% (c)55% (d)48%

Answer : b)45%

Solution:

Probability that Chennai will win = Probability that it rains X Probability of Chennai winning during rain + Probability that it does not rain X Probability of Chennai winning when it is not raining

= 40/100 X 30/100 + 60/100 X 55/100 = 1200/10000 + 3300/10000 = 4500/10000 = 45/100 = 45%

Question 105

In a college, semester marks are given to I year students.23% of students passed in both I and II semesters and 45% of students passed in I semester. Find what percent of student who have passed in I semester also passed in the II semester.

a) 35% b)42% c)51% d)56%

Answer : c)51%

Solution :
To solve such problems, we have to use the conditional probability formula,
\[ P(B|A) = \frac{P(A \text{ and } B)}{P(A)} \]
In the above formula,
- \( P(A \text{ and } B) \) denotes percentage of students passed in both semester
- \( P(A) \) denotes percentage of students passed in I semester.
- \( P(B|A) \) denotes percentage of students those who have passed in II semester after having passed I semester.

\[ P(A \text{ and } B) = 23\% \text{ or } 0.23, \quad P(A) = 45\% \text{ or } 0.45 \]
\[ P(B|A) = \frac{0.23}{0.45} = 51\% \]

**Question 106**

In a kindergarten school, there are 500 students in LKG, and 400 students in UKG. Among these students, there are 30 sibling pairs, each consisting of one LKG student and one UKG student. If one student is to be selected at random from each class, find the probability that the two students selected will be a sibling pair?

(a) 3/20000 (b) 1/3600 (c) 9/1000 (d) 1/15

**Answer:** a) 3/20000

**Solution:**

The probability of selecting a student from the 500 LKG students who is a member of a sibling pair is 30/500 = 3/50. Then the probability of selecting one student among the 400 UKG students who is the other member of that pair is 1/400. Therefore, the probability that the two students selected will be a sibling pair is (3/50)(1/400) = 3/20000

**Question 107**

Study of animals is a passion for a few scientists. They spend their life time in trying to analyse the behaviour of animals – like tigers, elephants, lions, bears etc. Michael is one such scientist interested in studying the behaviour of bears. He was in the North Pole where one can find quite a good number of bears. One day morning around 8 am he came to his lab. Thereafter he went four kilometers by walk in the northern direction. After taking rest at that spot for a few minutes he went for three kilometers in the eastern direction and there he spotted a group of bears. How far from his starting place was he and what is the colour of the bear?

a) 5 km, black b) 5 km, white c) 4 km, white d) 4 km black.

**Answer:** b) 5 km, white

**Solution:**
For finding out the distance you have to apply Pythagoras theorem and find the distance.
\[ \sqrt{3^2 + 4^2} = 5 \]
Since the scientist is in North Pole, he can find only white bears.

**Question 108**

Mr. Edward, a scientist started from his house going after a black bear and went 2 metres towards East. He then turned towards right and goes 25 metres and again goes towards East travelling 15 metres and then turns left and travelled for 18 metres. He then goes towards east and travels 7 metres to reach the spot where black bear was there. How far is he from the house?

a) 13 m b) 15 m c) 20 m d) 25 m

**Answer:** d) 25 m

**Solution:**

Here the scientist goes two metres towards east from his house, (starting point). Then he turned right and walked 25 metres towards south. At this stage he turned left and travelled towards east 15 metres. He stopped there and turned left and travelled 18 metres and then he turned right and walked towards east 7 metres. He stopped at that place and got the black bear.

When the movement of the scientist is drawn his present position can be found out using Pythagoras theorem.
On the one side it will be 7 metres and on the other side it will be 24 m \((2 + 15 + 7)\).
Applying Pythagoras theorem --- $\sqrt{7^2 + 24^2} = 25 \text{ m.}$

**Note:** In this problem you have to draw the diagram carefully and also identify the correct distances – Some may be misled to take one side as 2 m and other side as 24 m. The first sentence in the problem guides some people to mark the figure wrongly.

**Question 109**

Louis Pasteur, a scientist walked one day 20 km towards North. He turned left and walked 40 km. He again turned left and walked 20 km. Finally he moved 20 km after turning to the left. How far is he from his starting position?

a) 20 km b) 30 km c) 50 km d) 60 km

**Answer:** a) 20 km

**Solution:**

Louis Pasteur started from his place and went 20 km towards north. Then he turned left and walked 40 km. At this stage he turned left and walked 20 km. Finally he moved 20 km after turning left. It may be seen that his present position is 20 km from the starting point. The starting point is to his right side now.

**Question 110**

Mr. Krishnaraj Manickam, a final year student of B. Tech -Information Technology from a College in Kanpur appeared for a recruitment test conducted by a leading IT company in campus interview. The question consisted of two parts – Part A and Part B. There were six questions in each part. A candidate has to answer seven questions in all choosing not more than five from one part. In how many ways a candidate can attempt this paper assuming he answers six questions?

a) 684 b) 780 c)612 d) none of these.

**Answer:** b) 780

**Solution:**
Each section has six questions. Candidate has to answer totally seven questions, choosing not more than 5 from each part.
Possible options are:
- 4 questions from Part A AND 3 questions from Part B OR 3 questions from Part A AND 4 questions from Part B OR 5 questions from Part A AND 2 questions from Part B OR 2 questions from Part A AND 5 questions from Part B.

Note: i) Number of ways to choose r questions from among n questions can be obtained by the 'combinations' formula nCr. ii) To solve questions like those we are seeing currently, all the ANDs should be replaced by 'X' (multiplication symbol) and ORs should be replaced by '+' (addition symbol).

Based on above two points in 'Notes', applying the combinations formula, replacing ANDs with x and ORs with + we get:
Total Possible Ways Of Choosing 6 Questions = \(6C_4 \times 6C_3 + 6C_3 \times 6C_4 + 6C_5 \times 6C_2 + 6C_2 \times 6C_5 = 300 + 300 + 90 + 90 = 780\)

**Question 111**

SSCT Consultancy Services wanted to select 78 candidates from the five engineering Colleges in Andhra Pradesh, Tamil Nadu, Kerala and Karnataka. They wanted only those candidates who have cleared all papers in semester exams to appear for their recruitment test. The test paper set by them consisted of two parts--- Part I and Part II. Each part consisted of 7 questions and the candidates are supposed to answer only six questions. Candidates were given the freedom to choose any 7 questions across Part I and Part II but with a simple condition that at least one question should be answered from part I. In how many ways a candidate can attempt this paper assuming he answers six questions?

a) 3295 b) 2996 c) 2955 d) none of these.

**Answer : b) 2996**

**Solution :**

Let us discuss possible ways for any given candidate to choose questions provided he answers at least one question from part A.
- 1 question from part A AND 5 questions from part B OR 2 questions from part A AND 4 questions from part B OR 3 questions from part A AND 3 questions from part B OR 4 questions from part A AND 2 questions from part B OR 5 questions from part A AND 1 question from part B OR 6 questions from part A AND none from part B

For above combinations possible ways of choosing questions
\[= 7C1 \times 7C5 + 7C2 \times 7C4 + 7C3 \times 7C3 + 7C4 \times 7C2 + 7C5 \times 7C1 + 7C6 \times 7C0\]
\[= 7 \times 21 + 21 \times 35 + 35 \times 35 + 35 \times 21 + 21 \times 7 + 7\]
\[= 147 + 735 + 1225 + 735 + 147 + 7 = 2996\]

**Question 112**
Raja Ganapathy, a final year student of Emperor Engineering College was aspiring to join a computer company as a software engineer had to attend a test. The test paper consisted of technical questions put in two parts A and part B. Each part consisted of 5 questions. Across Part A and Part B he has to answer 6 questions in total with a condition that he has to answer at least 2 questions from each of the sections. However, after reading the questions he realized he knew answers for 4 questions from Part A and 3 questions from Part B. In how many ways Raja Ganapathy can attend this technical test paper?

a) 100 b) 200 c) 50 d) none of these.

Answer : b) 200.

Solution :

He knew at most 4 questions from Part A and 3 from Part B. Also there is a condition that he has to answer at least 2 questions from each of the sections. Based on these constraints he can choose his 6 questions as below:

Note : He knews at most only 3 questions from Part B (as per question). Therefore, though rules permit he will be unable to answer 4 questions from Part B.

4 Questions from Part A AND 2 Questions from Part B OR 3 Questions from Part A AND 3 Questions from Part B
For above combinations possible ways of choosing questions
= 5C4 X 5C2 + 5C3 X 5C3
= 5 X 10 + 10 X 10 = 50 + 100 = 150

Question 113

In an exhibition arranged every year in island Grounds, there is a toy train with twelve different whistles. It was displayed as if travelling in a circle of radius of 8 m at 12 m per minute. But on account of a defect in the toy it was making only two whistles at random. What are the odds that this toy train makes three consecutive music whistle of the same type?

a)1/8 b)1/16 c)1/32 d)none of these.

Answer : a) 1/8

Solution :

Originally there are twelve different whistles. But on account of defect only two whistles are now being made. Therefore probability of one particular whistle to blow would be 1/2. Probability of same whistle (out of the two available now) being made three times consecutively is = (Probability of one particular whistle blowing)^3 = 1/2 X 1/2 X 1/2 = 1/8.

Question 114

Costco Toy Manufacturers made a new toy which is capable of making 8 different sounds as the toy is made to run with a battery being fitted to it. The toy is capable of being made to
run in a circular way and also in straight line. If the toy goes and hits another surface it will turn and run again. This toy is capable of running continuously even for 30 minutes when fitted with high value batteries. On account of a defect now the battery was making only three different sounds. What are the odds that this toy makes two consecutive sounds of one type and final sound of any other type?

a) 1/9  b) 1/27  c) 2/27  d) none of these.

**Answer :** b) 2/27

**Solution :**

The toy has 8 different sounds fitted. But on account of defect it can make only 3 different sounds now.

$P_1 = \text{Probability that the toy makes two consecutive sounds of same type} = (\text{Probability of the toy making any one particular sound})^2$

Probability for the same toy to make the third sound that is different from first = $P_1 \times$ Probability of the third sound being a different one -> eq 1

Now, after a toy makes a particular sound two times, the probability of the third sound being a different one would be: 

$\frac{\text{No of other possible sounds}}{\text{Total number of sounds}} = 2/3$.

Applying the above value in eq 1 we get

$P = P_1 \times 2/3 = (1/3)^2 \times 2/3 = 2/27$.

**Question 115**

Emergent Cellphone company made a cell phone which is capable of giving different caller tunes. It had originally 10 different caller tunes. This cell phone fell into a box containing water and it resulted in damage and now the cell phone is making only any one of 2 different caller tunes when calls are received. What is the probability that the cell phone will ring both the caller tunes at the same instance?

a) 1/2  b) 1  c) 1/3  d) none of these.

**Answer :** d) none of these

**Solution :**

This is a tricky question. In the question it is clearly mentioned that at any instance any one of the two caller tunes will be played. There is absolutely no hint that two caller tunes can be played at the same instance. Hence two caller tunes being played at the same instance is
an impossible case and hence the probability should be 0. Hence, none of these will be the answer.

**Study the following information carefully and answer the questions:**
Arvind, Balu, Cheena, Daya, Ekambaram, Felix, Ganesh and Hirman are sitting around a circle, facing the centre. Arvind sits fourth to the right of Hirman while Hirman is second to the left of Felix. Cheena is not the neighbour of Felix and Balu. Daya sits third to the left of Cheena. Hirman never sits next to Ganesh. Ekambaram sits third to the left of Felix.

1. Which of the following pairs sit between Hirman and Ganesh?
   a) Balu-Hirman  b) Ekambaram-Felix  c) Cheena-Ekambaram  d) Daya-Balu
   
   **Answer:** c) Cheena-Ekambaram

To answer this question as well the following questions we will have to draw the circle with positions of the friends plotted. Clockwise – Hirman, Ekambaram, Cheena, Ganesh, Arvind, Daya, Felix, Balu.

Arvind sits fourth to the right of Hirman while Hirman is second to the left of Felix. We can plot these three friends as below. (Fig i)

![Fig i](image)

Ekambaram sits third to the left of Felix. This can be plotted as below. (Fig ii)

![Fig ii](image)

Daya sits third to the left of Cheena. There is only one way this is possible which is plotted as below. (Fig iii)

![Fig iii](image)
Cheena is not the neighbour of Felix and Balu. Therefore, Balu has to be adjacent to Hirman as plotted below. (Fig iv)

Only one spot left is for Ganesh. It is given he is not a neighbour of Ganesh which is satisfied as well by the below plot. (Fig v)

Now from the above diagram we can easily say that Cheena-Ekambaram pair sits between Hirman and Ganesh.

(While drawing this diagram we have to be careful to see that left-right is for the people seated in the circle and not for us. Also they are seated facing the centre. This should be kept in mind.)

2. Who sits second to the right of Balu?
a) Arvind b) Cheena c) Daya d) Ekambaram

**Answer:** c) Daya. (based on the diagram already drawn)

3. Which is the position of Balu with respect to Cheena?

   (i) Third to the right
   (ii) Sixth to the left
   (iii) Third to the left
   (iv) Fifth to the left

   a) Only II b) Only II and III c) Only I and IV d) Both III and IV

   **Answer:** c) Only I and IV

4. Who amongst the following sits between Balu and Daya?

   a) Ganesh b) Felix c) Hirman d) Arvind

   **Answer:** b) Felix

5. Who is immediate right to Arvind?

   a) Cheena b) Daya c) Ganesh d) Data inadequate

   **Answer:** c) Ganesh.

6. Four of the following are alike in a certain way based on their positions in the seating arrangement and so form a group. Which is the one that does not belong to that group?

   a) Arvind-Ekambaram b) Hirman -Felix c) Balu - Daya d) Ganesh - Ekambaram

   **Answer:** a) Arvind-Ekambaram. In all other pairs one person is sitting between them whereas in this pair two people are there.

**Question 116**

Gangaram Sait bought three DVD players for Rs.1000 each. He wanted to make a profit of 20% by selling these and accordingly marked the selling price. He was forced to sell the first two DVD players with a discount of 5% for cash. Now he wanted to see that he makes over- all profit of 20% by selling of these three DVD players. Hence for ensuring this by what percentage over the cost price should he sell the third DVD player?

   a) 32% b) 28% c) 42% d) 48%

   **Answer:** a) 32%

   Solution:
Cost price of the DVD players = Rs.1000 each
Selling price marked by him to achieve 20% profit = \( 120/100 \times 1000 = Rs. 1200 \) each
The first two DVD players he sold at a discount of 5% on S.P.
Without discount the SP of Two DVD players should had been = Rs. 1200 x 2 = Rs.2400
But since he discounts 5% from SP, he sold them at \( 2400 \times 95/100 = Rs.2280 \)

Since he wanted to make overall gain of 20% on the sale of the three DVD players he should sell them at \( 3000 \times 120/100 = Rs.3600 \)
Since he has already sold 2 DVD players for Rs. 2280, he must sell the third DVD player for \( 3600 - 2280 = Rs.1320 \)
Profit Percentage on Third DVD Player = \( \frac{SP - CP}{CP} \times 100\% = \frac{1320 - 1000}{1000} \times 100\% = 32\% \)

**Question 117**

Miserlal and Company dealing in computers and laptop marked up its laptop selling prices by 40% over its cost.(for 12 laptops) In order to attract more youngsters they offered a discount of 30% over the selling price of these laptops. They advertised in the leading English dailies and vernacular dailies besides using Television media. The company sold 8 laptops on these terms. The company sold the remaining four laptops at a discount of 20% over the selling price. What is resultant profit or loss percentage made in the sale of these 12 laptops by Miserlal and Company.

a) Loss of 2 2/3%  
b) profit of 2 2/3 %  
c) Loss of 4 1/3%  
d) profit of 4 1/3%

**Answer :** b) profit of 2 2/3%

**Solution :**

Let the cost price of these 12 laptops be Rs.100 each
Then Selling price of these 12 laptops at 40% profit will be \( 140/100 \times 100 = Rs.140 \) each
Eight laptops are sold at a discount of 30% on S.P
Then each of these 8 laptops is sold at \( 140 \times 70/100 = Rs.98 \)
Therefore, Total SP of Eight laptops = \( 98 \times 8 = Rs.784 \) ...(1)

Four laptops are sold at discount of 20% over S.P.
Each such laptop is sold at \( 140 \times 80/100 = Rs.112 \)
Therefore, Total SP of these four laptops = \( 112 \times 4 = Rs. 448 \) ...(2)

Totally 12 laptops are sold at Rs.784 + Rs. 448 = Rs.1232 (we get this by adding values from (1) and (2))
CP of 12 laptops = \( 12 \times 100 = Rs. 1200 \)
Therefore profit percentage = \( \frac{SP - CP}{CP} \times 100\% = \frac{1232 - 1200}{1200} \times 100\% = (32/1200) \times 100\% = 2 2/3\% \) profit

**Question 118**
Vivek and Sons are leading sellers of luxury goods like Air conditioners, refrigerators, colour televisions, washing machines etc. They bought twenty branded refrigerators at Rs. 9600 each. They marked the selling price adding 25% over the purchase price. The company wanted to make 20% profit by the sale of these twenty refrigerators. A group of software programmers from Sugarwell Info Systems, Chennai approached them for buying refrigerators and in order to get new clientele they offered 10% discount on the selling price and sold 12 refrigerators. What is the percentage of profit they should add over the selling price already marked while selling the other 8 refrigerators in order to ensure that they make a profit of 20% over cost price in the sale of twenty refrigerators?

a) 5% b) 6% c) 7% d) none of these.

**Answer :** a) 5%

**Solution :**

Cost price of twenty refrigerators = Rs. 9600 x 20 = Rs.192000
Selling price marked on each of these 20 refrigerators at 25% over cost price = 125/100 x 9600 = Rs.12000
12 Refrigerators were sold with a discount of 10% over selling price i.e they are sold at 90/100 x 12000 = Rs.10800 each

Amount received on sale of 12 refrigerators - Rs.10800 x 12 = Rs.129600
Vivek and Company wants to make an over all profit of 20%
On Rs. 192000 and hence they should receive totally 120/100 x 192000 = Rs.230400
Balance amount to be received by selling 8 refrigerators to make a profit of 20% = Rs.230400 - 129600 = Rs.100800

Price at which these 8 refrigerators to be sold = Rs.100800 / 8 = Rs.12600
Earlier planned selling price = Rs.12000
To sell each of the 8 refrigerators at Rs. 12600 each instead of the planned Rs. 12000 each, the price has to be marked up by Rs.600 which means 600/12000 x 100 =5% over planned SP.

**Question 119**

Mr. Pugazh Vendhan, a building contractor was approached by Sumanth Apartments for constructing a new water tank and installation of pipes for filling up the same. Mr. Pugazh Vendhan made a study of the complex and fitted with Pipe A and Pipe B. Pipe A can fill the tank fully in 16 hours and Pipe B can fill the tank fully in 24 hours. Pipe A and Pipe B run together for 8 hours. Thereafter Pipe A was shut and Pipe B alone was used. How many hours more would Pipe B take to fill the tank fully?

a) 3 hours b) 4 hours c) 6 hours d) 8 hours

**Answer :** b) 4 hours.

**Solution :**
Pipe A can fill the tank fully in 16 hours.
In one hour Pipe A will fill 1/16 of the tank.
Similarly Pipe B will fill in one hour 1/24 of the tank.
The two pipes run for 8 hours.
So in 8 hours Pipe A and Pipe B will fill
\((\frac{1}{16} + \frac{1}{24})\) 8 = (5/48) x 8 = 5/6 of the tank.
1/6 of the tank is to be filled in by Pipe B

<table>
<thead>
<tr>
<th>hour</th>
<th>portion of tank that can be filled</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>(\frac{1}{24})</td>
</tr>
<tr>
<td>?</td>
<td>(\frac{1}{6})</td>
</tr>
</tbody>
</table>

Pipe B can fill in 1 hour 1/24 of tank
1/6 of the tank will be filled in \(\frac{1}{6} \times \frac{24}{1} = 4\) hours.

**Question 120**

Velavan and Company are experts in providing plumbing facilities. They were approached for construction of a community water tank in Oragadam. Velavan and Company built a huge water tank and fitted it with three pipes named Cauvery, Ganga and Godavari. Pipes Ganga, Cauvery and Godavari can fill the community water tank in 30 hours, 25 hours and 40 hours respectively. In order to see that all the pipes are put into use equally, the Chairman of Oragadam Municipality advised the operator to run the Pipes Ganga, Cauvery and Godavari one after the other i.e. each pipe to be run for one hour each. Viz. Ganga will run for one hour followed by Cauvery for one hour and Godavari for one hour. Again the cycle will be repeated like this. When will the tank be filled fully i.e. during the running of Ganga or Cauvery or Godavari?

a) Ganga, 33rd hour b) Ganga, 31st hour

c) Cauvery, 33rd hour d) Cauvery, 32nd hour

**Answer :** b) Ganga, 31st hour

**Solution :**

Ganga can fill the tank in 30 hours. In one hour it can fill \(\frac{1}{30}\)th part of tank.
Cauvery can fill the tank in 25 hours. In one hour it can fill \(\frac{1}{25}\)th part of tank.
Godavari can fill the tank in 40 hours. In one hour it can fill \(\frac{1}{40}\)th part of tank.
Ganga, Cauvery and Godavari, when they run for one hour each (totally 3 hours)
\((\frac{1}{30} + \frac{1}{25} + \frac{1}{40})\) of the tank will be filled in.
\(= \frac{59}{600}\) of the tank will be filled in three hours

So in 30 hours \(\frac{590}{600}\) of the tank will be filled in.
Portion of tank unfilled after 30 hours would be \(1 - \frac{590}{600} = \frac{1}{60}\)
1/60 of the tank will be left unfilled after 30 hours.
During 31st hour Ganga is capable of filling \(\frac{1}{30}\) of the tank.
But since \(\frac{1}{30}\) is greater than that of the remaining tank portion \(\frac{1}{60}\), Ganga will be filling the tank during 31st hour comfortably.
**Question 121**

Anjali Plumbing Company has two pipes – Pipe X and Pipe Y – these pipes can fill a tank in 37 ½ minutes and 45 minutes respectively. Both pipes are opened. The tank will be filled in just 30 minutes, if the pipe Y is turned off after ____.

a) 10 min b) 5 min c) 9 min d) 15 min

**Answer :** c) 9 min.

Solution :

Pipe X can fill the full tank in 37 ½ = 75/2 minutes. Therefore in one minute it can fill 1/(75/2) = 2/75 th portion of tank.

Pipe Y can fill the full tank in 45 minutes. Therefore in one minute it can fill 1/45 th portion of tank.

Let Pipe Y be turned off after x minutes
Both the pipes would be running for the first x minutes, and then pipe Y alone will run for the remaining (30 - x) minutes.
Then Part filled in by (pipe X + pipe Y) in x min + part filled in pipe Y in (30-x) min = 1
(as you would be knowing 1 represents full tank)

Therefore ( 2/75 + 1/45)x + (30- x) 2/75 = 1
11x/225 + (60 - 2x) / 75 = 1
11x + 180 - 6x = 225

**Question 122**

Sridevi can row 15 kmph in still water. If in a river running at 3 km an hour, it takes her 40 minutes to row to a place and back, how far off is the place?

a) 5 4/5 km b) 4 4/5 km c) 6 2/5 km d) none of these.

**Answer :** b) 4 4/5 km

Solution :

Speed of boat = 15 kmph ---- B
Speed of current(river) ---3 kmph – C
Effective downward speed D (downward ) = Speed of boat + Speed of river = 15 +3 = 18 kmph
Effective upward speed U (upward ) = Speed of boat - Speed of river = 15 – 3 = 12 kmph
Let the place of interest be at a distance of x Km from start.
Time taken to row to x and come back = x/D + x/U = 40mins = 2/3 hours
Or, x/18 + x/12 = 2/3 (40 minutes)
x = 4 4/5 km
**Question 123**

AK Rehman can row 180 km upstream and 120 km downstream in 28 hours. Also he can row 90 km upstream and 90 km downstream in 16 hours. Find the speed of AK Rehman in still water and the speed of the current.(km/hour)

a) 15, 2 b) 18, 2 c) 14, 2 d) 12, 3

**Answer :** d) 12, 3

**Solution :**

Let the effective upstream speed be $x$ and the effective downstream speed be $y$

AK Rehman can row 180 km upstream and 120 km downstream in 28 hours.

Distance while travelling upstream / Effective upstream speed + Distance while travelling downstream / Effective downstream speed = Total time taken for upstream and downstream

Or $\frac{180}{x} + \frac{120}{y} = 28 \quad \ldots (1)$

Also it is given that he can row 90 km upstream and 90 km downstream in 16 hours

Similar to eq 1 we can form a new equation as below

$\frac{90}{x} + \frac{90}{y} = 16 \quad \ldots (2)$

Multiply by 2 on both sides of eq 2 we get,

$\frac{180}{x} + \frac{180}{y} = 32 \quad \ldots (3)$

(1) - (3) = $\frac{180}{x} + \frac{120}{y} - \frac{180}{x} - \frac{180}{y} = 28 - 32 = 4$

-60/y = -4

Effective downstream speed = $y = 15$

Effective upstream speed = $x = 9$

Speed of boat can be calculated using the below formula :

Speed of Boat = Effective upstream speed + Effective downstream speed / 2 = (15 + 9)/2 = 12.

Speed of current can be calculated using the below formula :

Speed of Current = Effective upstream speed - Effective downstream speed / 2 = (15 - 9)/2 = 3.

**Question 124**

On Monday Mayawati rows 42 Km upstream to a spot and returns back. While returning she overshoots the starting point by 48 km. The overall travel time is 8 hours. On Tuesday Mayawati rows 70 km upstream to a spot. Now while returning she is careful not to overshoot as on Monday. However, she again overshooted the origin by 2 km. The overall journey time was 9 hours. What is the speed of Mayawati in still water?

a) 18 km/hour b) 12 km/hour c) 14 km/hour d) 16 km/hour

**Answer :** d) 16 km/hour

**Solution :**
Note: This question is very much similar to the 2nd question except for the way the question is worded. On Monday she travels 42 Km upstream. While returning she overshoots her starting point by 48 km. This means she has travelled $42 + 48 = 90$ km during downstream. In total for upstream and downstream she has taken 8 hours. Let her upstream speed be $U$ and downstream speed be $D$. Then similar to 2nd question, we can form the below equation.

$$\frac{42}{U} + \frac{90}{D} = 8 \quad \ldots (1)$$

On Tuesday she travels 70 Km upstream. While returning she overshoots her starting point by 2 km. This means she has travelled $70 + 2 = 72$ km in downstream. In total for upstream and downstream she has taken 9 hours. Then similar to 2nd question, we can form the below equation.

$$\frac{70}{U} + \frac{72}{D} = 9 \quad \ldots (2)$$

MULTIPLYING eq 2 by 3 on both sides, we get

$$\frac{210}{U} + \frac{216}{D} = 27 \quad \ldots (3)$$

MULTIPLYING eq 1 by 5 on both sides, we get

$$\frac{210}{U} + \frac{450}{D} = 40 \quad \ldots (4)$$

$$\text{eq (4) - eq (3) gives : }$$

$$\frac{210}{U} + \frac{450}{D} - \frac{210}{U} - \frac{216}{D} = 40 - 27 = 13$$

$$\frac{234}{D} = 13$$

$$D = 18$$

Substituting $D = 18$ in eq (1), we get,

$$\frac{42}{U} + \frac{90}{18} = 8$$

$$\frac{42}{U} = 8 - 5 = 3$$

$$42 = 3U$$

$$U = 14$$

Speed of boat can be found using the formula $(D + U)/2$

$$\text{Speed of boat } B = (D + U)/2 = (18 + 14)/2 = 16 \text{ km/hour}$$

**Question 125**

A school boy participated in a physical exercise camp and did on the first day one jump, four steps on second day and nine steps on the third day. How many jumps he will be doing on 11th day?

a) 650 b) 506 c) 580 d) none of these.

**Answer:** b) 506.

**Solution:**

**Jumps Count:** On the first day 1, Second day - 4 jumps and third day – 9 jumps and so on upto 11th day.

In other words, he does $1^2$ jump on I day, $2^2$ jumps on II day, $3^2$ jumps on third day and so on.
Putting this in the form of series and adding till 11th day we get,
\[ 1^2 + 2^2 \ldots \ldots + 11^2 \]
This is nothing but sum of squares of n natural numbers where n is 11. To calculate sum of squares of n natural numbers, we can use the formula, \( \frac{n(n+1)(2n+1)}{6} \)
Substituting \( n = 11 \) in the above formula and calculating these sum, we get \( \frac{11 \times 12 \times 23}{6} = 506 \).

**Question 126**

A philanthropist decided to distribute sarees on the following pattern – On the first day 2 people, on the second day 4 people, on the third day 6 people and so on. Assume he starts this on 1st February, 2012. How many sarees he will be distributing in the month of February 2012?

a) 806 b) 870 c) 885 d) none of these.

**Answer :** b) 870

**Solution :**

Month of February 2012 has 29 days.

Formula for addition of even numbers starting from 2… upto \( m \)
\[ = m(m+1) \]
Substituting \( m = 29 \), we get :
\[ (29 \times 30) = 870. \]

**Question 127**

An intelligent student of an Engineering College was asked to add a first few natural numbers (i.e. 1+2+3\ldots) as long as he could. As the student stopped, he gave the answer as 786. But the answer was not correct and the student has omitted to add a number. What is the number which the student omitted to add?

a) 31 b) 45 c) 56 d) 34

**Answer :** d) 34.

**Solution :**

Formula for addition of numbers from 1 to \( n \) -- \( \left\lceil \frac{n(n+1)}{2} \right\rceil \) divided by 2. (We will be using this formula often during the below solution.)
Calculating for 1 to 10, we get 55
Calculating for 1 to 20, we get 210
Calculating for 1 to 30, we get 465 -> (i)
Calculating for 1 to 40, we get 820 -> (ii)

Since the sum given by the student : 786 lies between 465 and 820, the number omitted by the student has to be within 31 to 40. (from (i) and (ii) )
Sum of numbers from 1 to 39 is 780 and sum of numbers from 1 to 40 is 820. Since the student has said the sum to be greater than 780, logically he should have added up to 40. Though he has added up to 40, he gave an incorrect answer 786 rather than the correct answer of 800. Therefore the omitted number = Correct sum - Incorrect sum = 820 – 786 = 34

**Question 128**

In a Construction Company, due to the lack of labourers, the output of the company decreases by 44%. By what percentage the number of labourers that should be increased so that the production remains the same as earlier?

a) 72.5%  b) 56%  c) 78.5%  d) none of these.

**Answer :** c) 78.5%

**Solution :**

In current conditions only 56% work only has been completed. (100% - 44%)

Let L number of labourers are present currently in the company. Then these L people are responsible for 56% of work.

<table>
<thead>
<tr>
<th>Labourers</th>
<th>% of Work</th>
</tr>
</thead>
<tbody>
<tr>
<td>L</td>
<td>56</td>
</tr>
<tr>
<td>?</td>
<td>100</td>
</tr>
</tbody>
</table>

Number of Labourers required to complete 100% of work = \(100L/56 = 1.7857L\)

Required Increase in the number of labourers = Number of Labourers Required To Complete 100% of work - Original Number of Labourers = 1.7857L - L = .7857L

Percentage increase in the number of labourers = Required Increase in the number of labourers / Original Number of Labourers x 100 = .7857L /L x 100 = 78.57%

**Question 129**

An event management Company wanted to complete its pending work. 4 women and 12 men together can complete a piece of work in four days. How many days will four men alone take to complete the piece of work if two women alone can complete the piece of work in 16 days?

a) 32 b) 24 c) 16 d) 12

**Answer :** b) 24 days.

**Solution :**

2 women can complete the work in 16 days. Hence 4 women can complete the work in 8 days. But it is given that 4 women and 12 men complete the work in 4 days. This means that addition of 12 men to workforce has reduced
the number of working days to 4 which is exactly half of 8 days that 4 women alone would had taken. Logically this is possible only when 12 men's work per day is equal to 4 women's work per day.

4 women's work = 12 men's work
Dividing by 4 on both sides,
1 woman's work = 3 men's work. -> eq 1
Now, as given, we know that 4 women + 12 men can complete the work in 4 days.

Applying eq 1 in the above statement we get,
4 x 3 men + 12 men can complete the work in 4 days
24 men can complete the work in 4 days.
If 24 men is replaced by just one man, he has to do all the work alone and he would take 24 times more number of days then that would had consumed by 24 men working together.

Therefore, 1 man can complete the work in 4 x 24 = 96 days.

Now, if this one man is replaced by 4 men working together, there will be four people to share the work and hence the time taken would be reduced by 4 times than it would had taken by one man working alone.

Therefore, four men can complete the work in 96 / 4 days = 24 days.

**Question 130**

In a media management company 6 men and 8 boys can do a piece of work in 10 days while 26 men and 48 boys can do the same in 2 days. Find the time taken by 15 men and 20 boys in doing the same type of work?

a) 4 days b) 5 days c) 6 days d) 7 days

**Answer**: a) 4 days.

**Solution**:

Let one man’s work for one day be x and
Let one boy’s work for one day be y
Then 6x + 8 y = 1/10 -> eq 1
26x + 48 y = 1/2 -> eq 2
Multiply eq 1 by 6 on both sides :
36x + 48 y = 3/5 -> eq 3
 eq 3 - eq 2 :
36x + 48y - 26x + 48y = 3/5 - 1/2
10x = 1/10 So x = 1/100 and y = 1/200
Amount of work that can be done by 15 men and 20 boys in one day = (15/100 + 20/200) = 1/4
Therefore 15 men and 20 boys can do the work in 4 days.
**Question 131**

A gentleman had ‘Rs. P’ with him. He wanted to distribute this amount to his five sons. He wanted his youngest son to get Rs. 20 more than his fourth son. He gave his third son Rs. 20 less than what he gave to his fourth son. His second son got Rs. 20 more than his first son and Rs. 20 less than what his third son got. How much did his first son get?

a) \( \frac{P-200}{5} \)  
b) \( \frac{P-120}{4} \)  
c) \( \frac{P-200}{4} \)  
d) none of these.

**Answer:** a) \( \frac{P-200}{5} \)

**Solution:**

Let his first son get \( x \).
Then second son will get \( x + 20 \).
Third son will get \( x + 40 \).
Fourth son will get \( x + 60 \).
Fifth son will get \( x + 80 \) (youngest son).

So \( x + (x + 20) + (x + 40) + (x + 60) + (x + 80) = P \)

\[ 5x + 200 = P \]

\[ x = \frac{(P - 200)}{5} \]

**Question 132**

A received 20% more salary than B. C received 20% more than A. D received 20% more than C. If D received salary of Rs. 34560, how much did A receive as salary?

a) Rs. 22000  
b) Rs. 24000  
c) Rs. 26000  
d) Rs. 20000

**Answer:** b) Rs. 24000

**Solution:**

Let B receive Rs. 100 as salary.
Then A will receive 20% more than B's salary. That is, A will receive, \( \frac{120}{100} \times 100 = \text{Rs. 120} \)

Thus, A will receive Rs. 120.

C will receive 20% more than A's salary. That is, C will receive, \( \frac{120}{100} \times 120 = \text{Rs. 144} \)

Thus, C will receive Rs. 144.

D will receive 20% more than C's salary. That is, D will receive, \( \frac{120}{100} \times 144 = \text{Rs. 172.8} \)

Thus, D will receive Rs. 172.80.

Now, we will have to find out the salary of A if D receives 34560 as salary. From our above assumption of B receiving Rs. 100, we can see that D will receive Rs. 172.80 when A receives Rs. 120. Our task is now to find A's salary when D receives 34560.
<table>
<thead>
<tr>
<th>D's Salary</th>
<th>A's Salary</th>
</tr>
</thead>
<tbody>
<tr>
<td>172.8</td>
<td>120</td>
</tr>
<tr>
<td>34560</td>
<td>?</td>
</tr>
</tbody>
</table>

A's Salary when D receives $34560 = \frac{34560 \times 120}{172.80} = \text{Rs. 24000}

**Question 133**

Agarwal has twice as much money as Edgar. Edgar has 50% more than Prasad has. If the average of the amounts they have is Rs.1100, how much money Agarwal has?

a) Rs. 1800  B) Rs.2100  c) Rs.800  d) none of these.

**Answer :** a) Rs. 1800

**Solution :**

Let Prasad has Rs.$P$
Then Edgar will have 50% more than prasad. That is, Edgar will have $\frac{150}{100} \times P = \frac{3}{2} P$
Agarwal will have twice as much as Edgar. Therefore Agarwal will have $\frac{3}{2}P \times 2 = 3P$
Average of their amounts = Sum of their amounts / 3 = Rs. 1100
Or Sum of their amounts = $1100 \times 3 = 3300$
Or $3P + \frac{3}{2}P + P = 3300$
$11P/2 = 3300$
P = Rs. 600
Agarwal's amount = $3P = 3 \times 600 = \text{Rs. 1800}$

**Question 134**

A contractor was engaged to construct a residential complex along with a water tank. The water tank can filled up by Pipe One in 6 hours and by Pipe Two in 8 hours. If the two pipes are opened one after the other each for one hour, how long will it take for the two pipes, pipe One and pipe Two to fill the water tank?

a) 8 hours 20 min  b) 7 hours 40 min  c) 6 hours 45 min  d) none of these.

**Answer :** c) 6 hours 45 min.

**Solution :**

Pipe one will fill $\frac{1}{6}$ of the tank in one hour. Pipe two will fill $\frac{1}{8}$ of the tank in one hour. These pipes are opened one after the other, each run for one hour.
In one turn – that is one hour of pipe one and one hour of pipe two, $\frac{1}{6} + \frac{1}{8} = \frac{7}{24}$ of the tank will be filled in.
So in 6 hours $\frac{21}{24}$ of the tank will be filled in and balance will be $\frac{3}{24} = \frac{1}{8}$ of the tank.
Now in the seventh hour Pipe one will be run. Pipe one can fill $\frac{1}{6}$ of the tank in 1 hour or
60 minutes. We can calculate the time taken by Pipe 1 to fill 1/8th of the tank as shown below:

<table>
<thead>
<tr>
<th>Tank Filled</th>
<th>Time Taken</th>
</tr>
</thead>
<tbody>
<tr>
<td>1/6</td>
<td>60 min</td>
</tr>
<tr>
<td>1/8</td>
<td>t min</td>
</tr>
</tbody>
</table>

\[ t = \frac{1}{8} \times \frac{6}{1} \times 60 = 45 \text{ minutes.} \]

So the tank will be filled in 6 hours 45 minutes.

**Question 135**

SivaChrist constructions constructed a community water tank for Pozhichalur village. The water tank can be filled by Karuna Pipe in 18 hours and Pandian pipe in 24 hours. Karuna Pipe will run for one hour and closed. Pandian pipe will run for the next one hour and closed. This process continues. Which pipe will be running when the tank is filled in fully? How many hours will it take for the tank to be filled in the above process?

a) Pandian, 30 hours 30 min  
b) Karuna, 10 hours 30 min  
c) Pandian, 5 hours 30 min  
d) Karuna, 20 hours 30 min

**Answer**: d) Karuna, 20 hours 30 min

**Solution**:

Karuna Pipe can fill the tank in 18 hours.  
In one hour Karuna Pipe will fill 1/18 of the tank  
Pandian Pipe will fill 1/24 of the tank in one hour.  
If both the pipes run one after the other once –  
\[ \frac{1}{18} + \frac{1}{24} = \frac{7}{72} \] of the tank will be filled.  
So, in 20 hours – that after 10 such running - 70/72 of the tank will be filled in and 1/36 of the tank need to be filled in.  
Karuna Pipe can fill 1/18th of the tank in 60 minutes. Then the time taken to fill 1/36th of the tank can be calculated as below:

<table>
<thead>
<tr>
<th>Tank Filled</th>
<th>Time Taken</th>
</tr>
</thead>
<tbody>
<tr>
<td>1/18</td>
<td>60 min</td>
</tr>
<tr>
<td>1/36</td>
<td>t min</td>
</tr>
</tbody>
</table>

\[ t = \frac{1}{36} \times 60 \times 18 = 30 \text{ minutes} \]

So Karuna pipe will be running when the tank is filled in and it will take 20 hours 30 min. for the tank to be filled in completely.

**Question 136**

Two pipe manufacturers were asked to show demonstration about the performance of their pipes. Pipe X and Pipe Y can fill a tank in four hours. Had they been opened separately Pipe
Pipe Y will take 6 hours more than Pipe X. How much time will Pipe X take to fill the tank separately?

a) 2 hours  b) 1 hour  c) 6 hours  d) 8 hours

**Answer:** c) 6 hours.

**Solution:**

Let the tank be filled in completely by Pipe X in x hours. Therefore in 1 hour, Pipe X will fill \(\frac{1}{x}\) of the tank.

Then Pipe Y will take \(x + 6\) hours. Therefore in 1 hour, Pipe Y will fill \(\frac{1}{x + 6}\) of the tank.

When Pipe X and Pipe Y are opened together they will take 4 hours to fill the entire tank. In other words, if Pipe X and Pipe Y are opened together for 1 hour, they would had filled \(\frac{1}{4}\)th of the tank. Putting this argument in equation form we get:

\[
\frac{1}{x} + \frac{1}{x+6} = \frac{1}{4}
\]

\[
x + 6 + x \text{ divided by } x(x+6) = \frac{1}{4}
\]

\[
8x + 24 = x^2 + 6x
\]

\[
x^2 - 2x - 24 = 0
\]

\[
(x-6)(x+4) = 0
\]

So \(x = 6\) (neglecting the negative value of \(x\)).

**Question 137**

The students of Vidya Mandir Secondary school, Jalpaiguri went for an excursion. It was seen that a boat travels at 14.5 km per hour when it goes along with the stream. By the time he starts returning the speed of the river doubled than its original value due to a sudden storm. The speed of the boat is 7 km per hour when it goes against the river stream. What is the speed of boat per hour?

a) 10 km  b) 8 km  c) 12 km  d) 7 km

**Answer:** c) 12 km

**Solution:**

Let the speed of the boat be \(B\) and the speed of stream be \(S\).

Equation for travel along with Stream : \(B + S = 14.5 \quad ----> \text{eq 1}\)

During the travel against the stream, the speed of the stream temporarily doubled. Therefore, Equation for travel against the stream = \(B - 2S = 7 \quad ----> \text{eq 2}\) (NOTE: We are using \(2S\) instead of \(S\) in the equation as speed of the stream has temporarily doubled when he travelled against the stream).

\[
\text{eq 1 - eq 2} = 3S = 7.5
\]

or \(S = 2.5\) kph

Substitute \(S = 2.5\) in eq 1

\(B = 14.5 - 2.5 = 12\)
**Question 138**

A boat man was driving a boat during a cyclonic storm during which time the speed of the river was considerably high than normal times. He found that the boat travelled 222 km in three hours when he was driving along with the river. But when he drove the boat against the river the boat travelled 100 km in two hours. What is the speed of the river per hour during cyclonic storm?

a) 10 km b) 12 km c) 8 km d) 9 km

**Answer :** b) 12 km

**Solution :**

Let the speed of the boat be $B$ and the speed of the river be $S$.

\[ B + S = \frac{222}{3} \]  \---- eq 1

\[ B - S = \frac{100}{2} \]  \---- eq 2

Adding equations 1 and 2 we get : \[ 2B = 300 + 444 / 6 \]

\[ 2B = 744/6 \]

\[ 2B = 124 \]

\[ B = 62 \]

Substituting $B = 62$ in eq 2 we get,

\[ S = B - \frac{100}{2} = 62 - 50 = 12 \]

**Question 139**

Maruti Cruisers sailed 132 km along with the river in six hours. Suddenly the boat had to return to the starting point and it started returning against the river and this time the Cruiser travelled at 128 km in eight hours. By how much percentage Cruiser's speed exceeds the speed of the River ?

a) 533.33% b) 444.44% c) 267.67% d) none of these.

**Answer :** a) 533.33%

**Solution :**

Speed of boat along with the river per hour = 22 km (132 divided by 6)
Speed of boat against the river per hour = 16 km (128 divided by 8)

\[ B + S = 22 \]  \---- eq 1

\[ B - S = 16 \]  \---- eq 2

Adding equations 1 and 2, we get : \[ 2B+S-B+S = 22 -16 = 6 =2S \]

\[ S = 3 \text{ km/hour} \]

Substituting $S= 3$, in eq 1 we get : \[ B + 3 = 22 \]

\[ B = 22 - 3 = 19 \text{ km /hour} \]

Cruiser's speed exceeds the speed of the River By : \[ \text{Cruiser's Speed} - \text{River Speed} / \text{River Speed} \times 100 \]

\[ \text{Speed} \times 100 = B - S / S \times 100\% = 19 - 3 / 3 \times 100 = 16/3 \times 100 = 533.33\% \]
Question 140

In a radio Station, the songs database contains songs from 2 Tamil movies, 1 Hindi movie and 1 Telugu movie. Each movie has 5 songs. They can play only 3 songs. If they want to play 3 tamil songs then what will be the probability?

a) $10C3 / 20C3$ b) $5C3 / 15C3$ c) $5C3 / 20C3$ d) $20C3 / 10C3$

**Answer :** a) $10C3 / 20C3$

**Solution :**

Since each movie has 5 songs, the total number of songs is 20. Out of 20 songs, they have to play 3 songs.
Therefore, number of ways of selecting 3 songs = $20C3$.
Number of ways of selecting 3 Tamil songs = $10C3$.
Probability of playing three tamil songs = Number of ways of selecting 3 Tamil songs / Number of ways of selecting 3 songs (any language) = $10C3 / 20C3$.

Question 141

There are two cricket teams namely Team A and Team B. Each has 15 players (including substitutes). Now a new team of playing 11 has to be formed by pulling players from both the teams. In how many ways 11 players can be selected such that at least 5 players are picked from each team?

a) $15C5 x 15C6$ b) $2(15C5 x 15C6)$ c) $(15C5)^2$ d) $15C6$

**Answer :** b) $2(15C5 x 15C6)$

**Solution :**

Since at least 5 players from each team should be pulled up the possible ways of selection are
5 players from Team A and 6 players from Team B (OR)
6 players from team A and 5 players from Team B.

**Case I** : Therefore, the number of way of selecting 5 players from Team A **AND** 6 players from Team B = $15C5 x 15C6$.

**Case II** : Similarly, the number of way of selecting 6 players from Team A **AND** 5 players from Team B = $15C6 x 15C5$.

Hence, the number of ways of selecting 11 players such that at least 5 players in each team = Case I **OR** Case II = $15C5 x 15C6 + 15C6 x 15C5$
= $2(15C5 x 15C6)$

P.S : In probability equations like those employed in the above question, **AND**'s need to be replaced by 'x' (multiply) and **OR** needs to be replaced by '+' (addition).
Question 142

In a College, there are 10 students in Maths department, 12 Students in Computer Science department and 8 students in Physics department. A recruiting company wants to select 4 students out of these 30 students with at least 1 student from each department. In how many ways the company can achieve this?

a) 12960 b) 12690 c) 19260 d) 16920

Answer:

Solution:

Since there should be at least 1 student from each department, the possible ways of selection are
1 Student from Maths, 1 student from computer science and 2 students from physics (OR)
1 Student from Maths, 2 students from computer science and 1 student from physics (OR)
2 Students from Maths, 1 student from computer science and 1 student from physics.

Note: Applying a very similar logic as that of the previous question,
Therefore, the number of ways of selecting 4 students such that at least 1 student from each department = $10 \times 12 \times 8 \times (7+11+9)/2 + (10 \times 12 \times 11 \times 8)/2 + (10 \times 9 \times 12 \times 8)/2$
= $(10 \times 12 \times 8)(7+11+9)/2$
= $10 \times 12 \times 8 (27/2)$
= $480 \times 27$
= 12960

Question 143

Priya wanted to mail 120 messages to her friend Banu. She mailed 1 message on the first day, 2 messages on the second day, 3 messages on the third day and so on. How many days she required to send all messages to Banu?

a) 16 days b) 17 days c) 15 days d) 14 days.

Answer: c) 15 days.

Solution:

Total number of messages = 120
On the 1st day, Priya mailed 1 message to Banu.
On the 2nd day, she mailed 2 messages to Banu and so on.....
Let X denote the number of messages send on the Xth day.
Therefore, 1st day messages + 2nd day messages + ...... + Xth day messages = 120.
$1 + 2 + 3 + ...... + X = 120$
$X ( X + 1) / 2 = 120$
\(X^2 + X = 240\)
\(X^2 + X - 240 = 0\)

By factoring the above eqn. we get
\(X^2 - 15X + 16X - 240 = 0\) (the middle term is obtained by the multiplicants of last term i.e 15 x 16 =240 and the subtracted value is 1 which is the middle term)
\(X(X - 15) + 16(X - 15) = 0\) or \((X + 16)(X-15)\)
\(X = 15\) or \(X = -16\)
\(X = 15\) (since number of days cannot be negative).
So Priya required 15 days to send all messages.

**Question 144**

An IT company conducted interview for B.E Students. On the first day, they selected one student. On the second day, they selected 8 students and on the third day, they selected 27 students and so on. How many students will be selected if they conduct interview for 10 days?

a) 6050 b) 2530 c) 3025 d) 6025

**Answer : c) 3025**

**Solution:**

On the first day, they selected 1 student.
On the second day, they selected 8 students.
On the third day, they selected 27 students and so on.
Since they conduct interview for 10 days, the number of students selected on the 10th day is 103 = 1000 students.

Total number of students selected = No. of students selected on 1st day + No. of students selected on 2nd day + .... + No. of students selected on 10th day.

Therefore, Total number of students selected = 1 + 8 + 27 + ..... + 1000.

\[= 1^3 + 2^3 + 3^3 + .... + 10^3.\]

By using the formula,
\[1^3 + 2^3 + 3^3 + .... + n^3 = \frac{(n(n+1))^2}{4},\]
Number of students selected = \(10 (10+1) / 2\)^2.
\[= (10 *11*10*11) / 4\]
\[= 3025.\]
Hence, the company has selected 3025 students in 10 days.

**Question 145**

Jeeva has a story book of 2047 pages. He read 1 page on the first day, 2 pages on the second day, 4 pages on the third day, 8 pages on the fourth day and so on. How many days it took for Jeeva to complete the book?

a) 10 days b) 12 days c) 11 days d) 13 days


**Answer :** c) 11 days

**Solution:**

Total number of Pages = 2047
On the 1\textsuperscript{st} day, Jeeva read 1 page.
On the 2\textsuperscript{nd} day, he read 2 pages
On the 3\textsuperscript{rd} day, he read 4 pages and so on.....
Let X denote the number of pages read on the X\textsuperscript{th} day.
Therefore, $1 + 2 + 4 + \ldots + X = 2047$

Then by using the formula, the sum of X numbers in G.P $= a \left( r^X - 1 \right) / (r - 1)$ where a – First term & r – Common ratio, we get

\[
1 \left( 2^X - 1 \right) / (2 - 1) = 2047
\]

\[
2^X - 1 = 2047
\]

\[
2^X = 2048 = 2^{11}
\]

\[
X = 11.
\]

So, Jeeva took 11 days to complete the book.

**Question 146**

Trisha and Priya talked over certain important issues for nearly one hour. After that they went to Coffee Day shop—Trisha had cold coffee and Priya asked for hot coffee. Both the drinks were charged at the same rate of Rs.75 per cup. Trisha started walking at 6 kmph towards eastern direction and Priya started walking at 5 kmph towards western direction. They started at 11 am. At what time will they be 44 km apart ?

a) 3 am b) 2 pm c) 3pm d) 4 pm

**Answer :** c) 3 pm

**Solution :**

Trisha and Priya started walking in eastern and western direction respectively at 11 am.
Trisha walked at 6 kmph and Priya started walking at 5 kmph. So the relative speed is 11 kmph.
Time required to be 44 Kms apart when the relative speed is 11 Km/hr = Distance Between Them / Relative Speed = $44/11 = 4$.
They will be 44 km apart after four hours from the time of starting. i.e. 3 pm. (candidates must be alert to not to mark a) 3 am as answer)

**Question 147**

Sundaramurthy can row at 8.5 kmph in still water and he finds it takes him thrice as long to row up as to row down the river. Find the speed of river in kmph.

a) 3.25 km/hr b) 5.25 km/hr c) 2.75 km/hr d) 4.25 km/hr
Answer: d) 4.25 km/hr

Solution:

Let the speed of the river be $c$.
His speed when rowing down = $8.5 + c$
His speed when rowing up = $8.5 - c$

In the question it has been given that "it takes him thrice as long to row up as to row down the river". This means the time taken for him to row up is 3 times the time taken for him to row down. In other words, his overall speed when rowing down will be 3 times greater than his overall speed when rowing up.

Let the time taken for upstream be $T_{up}$ and for downstream be $T_{down}$.

$T_{up} = 3 \times T_{down}$

$T_{down} / T_{up} = 1 / 3$

$\frac{\text{Speed Up}}{\text{Speed Down}} = \frac{\text{Time Down}}{\text{Time Up}}$

$\frac{8.5 - c}{8.5 + c} = \frac{1}{3}$

$8.5 + c = (8.5 - c) \times 3$

$8.5 + c = 25.5 - 3c$

$c + 3c = 25.5 - 8.5 = 17$

$4c = 17$

$c = 4.25 \text{ km/hr}$

Question 148

In a software company employees arranged for a picnic. At the planning stage it was found that per employee share of the total cost would be same as the number of enlisted employees. However, on the day of picnic the number of employees who were present was 20 less than the enlisted number. Consequently, per employee share shot up by 20%. What was the number of employees who had enlisted initially? How much did each employee pay finally?

a) 120, Rs.172.80 b) 100, Rs.172.80 c) 120, Rs.144 d) none of these.

Answer: c) 120, Rs.144

Solution:

Let the number of employees initially be $n$

From the question, the Cost per Employee = $n$ (as it is given that "employee share of the total cost would be same as the number of enlisted employees")

Hence total cost = Cost per Employee x Number of Employees = $n \times n = n^2$

Twenty employees did not turn up and hence those participating in picnic = ($n - 20$). Hence the cost of $n^2$ has to be shared by the present ($n - 20$) employees.
Total cost per employee will be \( \frac{n^2}{(n-20)} \)
This is to be given to be 20\% more than the original figure.

So, \( \frac{n^2}{(n-20)} = \frac{120}{100} \times n \)
\( n^2 = 1.20 \times n \times (n-20) \)
Dividing by \( n \) on both sides,
\( n = 1.2 \times (n - 20) \)
\( n = 1.2n - 24 \)
\( 24 = 0.2n \)
\( n = 120 \)
Initial amount planned to be paid by each employee = \( n = Rs.120 \)
Final and actual amount paid by each employee = \( \frac{n^2}{(n-20)} = \frac{14400}{100} = Rs. 144. \)

**Question 149**

Vijay, a shop owner was running a shop near IEFS Engineering College, Warangal. The shop is patronised by students, teachers, other staff members of the College besides to tourist public. One day Rehamana a tourist bought a new wrist watch from Vijay for Rs. 2480. Rehamana was not having sufficient money in cash and then issued a cheque for Rs.2800. Vijay paid the difference amount to Rehamana . Vijay gave the cheque to his cousin brother and took money from him. Vijay’s cousin found that there was no balance in the bank account of Rehamana and the cheque was returned unpaid. Vijay had to reimburse the cheque amount to his cousin and take back the cheque. The cost price of wrist watch was Rs. 2120. What is the gain or loss made by Vijay in this transaction?

a) Gain of Rs. 2440 b) loss of Rs. 2440 c) gain of Rs.5240 d) Loss of Rs. 5240

**Answer : b) loss of Rs. 2440/**.

**Solution :**

**Transaction I (involving Vijay and Rehamana)**
Rehamana gave a cheque for Rs. 2800 for the watch worth Rs. 2480. The difference amount = 2800 - 2480 = Rs. 320 was given by Vijay to Rehamana.

**Transaction II (check realization by Vijay with the help of his brother)**
Vijay when tried to realize the cheque, the cheque bounced. Though he got the money in advance from his brother, at the end, he had to return that money as cheque was not valid. Since he had returned the money that he got from his brother, his net gain or loss in transaction II (with his brother is 0).

**Summing Up :**
Total Loss To Vijay = Loss In Transaction I + Loss in Transaction II + Cost Price of Watch (as he has now given the watch to Rehamana which he cannot collect back)
= 320 + 0 + 2120
= Rs. 2440

**Question 150**
A leading seller of Vegetables in Koyambedu converted a loss of 20% into a profit of 25% when the selling price of potatoes was increased by Rs.225 per tonne. Find the cost price of potato per tonne?

a) Rs.600  b) Rs. 800  c) Rs. 500  d) None of these.

**Answer :** c) Rs. 500

**Solution :**

Let the cost price per tonne = CP.

Initial Selling Price $SP_1$ when he was making a loss of 20% = $SP_1 = 80\% \text{ of } CP = 0.8CP$

Selling Price $SP_2$ when he was making a profit of 25% = $SP_2 = 125\% \text{ of } CP = 1.25CP$

Increase in selling price = $SP_2 - SP_1 = 225$

$1.25 \text{ CP} - 0.80 \text{ CP} = 225$

$0.45\text{CP} = 225$

$\text{CP} = Rs. 500$

**Question 151**

A toy vendor has four toys each costing Rs.100 with him. He plans to make an overall profit of 25% by spreading the profit equally across all the toys. There comes a buyer who wants three toys but at a discount of 5% on the SP. He accepts and sells three toys at a discount of 5% from the marked selling price. Now, if another buyer comes to his shop, by how much percentage the selling price needs to be increased from the cost price so that still he manages to make an overall profit of 25% with all 4 toys.

a) 43.25%  b) 43.75%  c) 43.55%  d) 43.65%

**Answer :** b) 43.75%

**Solution :**

CP of each of the toys - Rs. 100.

According to his initial plan, he would had thought to sell each of the toys at Rs. 125 so that he would make a net profit of 25% by selling all the toys.

But the first buyer wants a discount of 5% on the selling price of Rs. 125.

Therefore, his discount per toy = $5/100 \times 125 = Rs. 6.25.$

Thus by selling three toys at a discount of Rs. 6.25 he would had lost $3 \times 6.25 = 18.75.$

Now he has to make up for this amount by increasing the selling price of the 4th toy.

Therefore his new selling price on the 4th toy = Rs. 125 (his planned selling price) + 18.75 = 143.75

Therefore his new marked price 143.75 is greater than the cost price of Rs.100 by, $(143.75 - 100) / 100 \% = 43.75\%.$

**Question 152**

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There are nine different toppings in Merry Brown Pizza shop. They have to make pizzas with different toppings. In how many ways can the shop keeper make pizzas with 2 different toppings?

a) 36  b) 48  c) 72  d) none of these.

Answer : a) 36

Solution :

The question deals with choosing 2 toppings from 9 available toppings REGARDLESS of the ORDER in which we pick. In cases, where the order of choice doesn't matter we need to use Combination Formula of nCr (formula to choose r options from n available options regardless of order). 

Number of ways to choose 2 different toppings from available 9 toppings = nCr = \(9C2 = \frac{9 \times 8}{1 \times 2} = 36\)

**Question 153**

In a toy shop there are seven different varieties of toys. The shopkeeper wants to make a selection of different toys of 3 different varieties?

a) 28  b) 35  c) 56  d) none of these.

Answer : b) 35

Solution :

This question is similar to the 1st question. 

Number of ways to select 3 varieties from 7 available varieties = nCr = \(7C3 = \frac{7 \times 6 \times 5}{1 \times 2 \times 3} = 35\)

**Question 154**

In how many different ways can a group of 4 boys and 2 girls be made out of a total of 8 boys and 4 girls?

a) 240  b) 360  c) 280  d) 420

Answer : d) 420

Solution :

\[N1 = \text{Number of ways to choose 4 boys from 8 boys} = \binom{8}{4} = 8C4\]
\[N2 = \text{Number of ways to choose 2 girls from 4 girls} = \binom{4}{2} = 4C2\]
Number of ways to choose 4 boys and 2 girls out of a total of 8 boys and 4 girls = \(N1 \times N2 = 8C4 \times 4C2 = 70 \times 6 = 420\)
Question 155

A typist was appointed in Correct technology services and she was asked to prepare 23 letters addressed to different people and prepare 23 covers addressed to them. She inserts these letters at random into the envelopes. (one letter per envelope). What is the probability that exactly one letter is inserted to the wrong envelope?

a) 7/23 b) 9/23 c) 0 d) 11/23

Answer : c) 0.

Solution :

There are 23 letters and 23 covers with addresses.
By mistake if the typist puts one of the letters in wrong address, there is no way but another letter has to be put in wrong cover. Hence, there is NO CHANCE that ONLY ONE of the letter is inserted in wrong envelope. Hence probability of such occurrence is 0.

For example, let the letters be L1, L2, L3..... L23 and let the respective covers with addresses be C1,C2,C3..... C23.

Lets say, if L2 is placed in C4 instead of C2 then L4 has left with no option but to be placed in C2. Hence, if one letter is misplaced, another letter has to be misplaced. Hence probability of ONLY ONE misplacement is zero as chances of ONLY ONE misplacement is zero.

Question 156

Ansar can do a work of making a sofa set in 40 hours and with the help of Nayeem, he can complete the same work in 24 hours. If they get Rs.1200 for the work, then what could be Nayeem’s share?

a) Rs. 360 b)Rs.420 c)Rs.480 d) Rs.540

Answer : c) Rs.480

Solution :

Ansar can do in one hour 1/40 of the sofa set work
Both Ansar and Nayeem perform in one hour 1/24 of the sofa set work.
Nayeem’s one hour work = One hour work of Both Ansar and Nayeem - One hour work of Ansar = 1/24 - 1/40 = 1/60
So, Nayeem will finish the work in 60 hours.
Ansar’s revenue share / Nayeem’s revenue share = Time taken for Ansar to complete the work / Time taken for Nayeem to complete the work = 60 / 40 = 3 / 2
Ansar’s revenue share : Nayeem’s revenue share = 3 : 2
Let Ansar's share be 3X and let Nayeem's share be 2X. Therefore 3X + 2X = 1200 (Total revenue of both)
Or $X = \frac{1200}{5} = 240$.
Therefore Nayeem’s share = $2X = 2 \times (240) = $Rs. 480

**Question 157**

8 men and 12 women together can complete construction of a house in 8 days. 6 men and 14 women can complete the construction of the same house in 10 days. Suppose 20 women alone work for construction of this house, how many days will they take to complete the same?

a) 36 days b) 40 days c) 32 days d) 24 days

**Answer:** b) 40 days

**Solution:**

Work done by 8 men and 12 women for 8 days is equal to
Work done by 6 men and 14 women in 10 days.
Let $m$ be the amount of work done by one man and let $w$ be the amount of work done by one woman. Then

$(8m + 12w) \times 8 = (6m + 14w) \times 10$

$64m + 96w = 60m + 140w$

$64m - 60m = 140w - 96w$

$4m = 44w$

$1m = 11w$

Construction of the house requires

$(8 \times 11w + 12w) \times 8 = 800$ women days.

So if the construction is to be done by 20 women only
It will take - $\frac{800}{20} = 40$ days.

**Question 158**

Bharath and Rajani together can complete a piece of work in 12 days and Rajani and Kamal together in 15 days. If Bharath is twice as good a workman as Kamal, then in how many days will Rajani along complete the same work?

a) 30 b) 24 c) 25 d) 20

**Answer:** d) 20

**Solution:**

Assume Bharath completes in $B$ days
Rajani completes in $R$ days
Kamal completes in $K$ days
Then $\frac{1}{B} + \frac{1}{R} = \frac{1}{12}$ --->$eq 1$ (Bharath and Rajani take 12 days to complete the work)

$\frac{1}{R} + \frac{1}{K} = \frac{1}{15}$ --->$eq 2$

$eq 1 - eq 2$ gives, $\frac{1}{B} - \frac{1}{K} = \frac{1}{12} - \frac{1}{15} = \frac{1}{60}$ --->$eq 3$
From the question it is given that Bharath is twice as efficient as Kamal. That is, if Bharath takes B days Kamal will take 2B days to complete the work. Therefore eq 3 becomes,

\[
\frac{1}{B} - \frac{1}{2B} = \frac{1}{60}
\]

\[
\frac{1}{2B} = \frac{1}{60}
\]

B = 30 days

\[
\frac{1}{R} = \frac{1}{12} - \frac{1}{30}
\]

\[
= \frac{3}{60} = \frac{1}{20}
\]

So Rajani will take 20 days to complete the work.

**Question 159**

Adhvaith can do a certain work in 30 days. Kashyap can do same work in 25 days. Adhvaith started the work and worked for 9 days. Kashyap came and joined to do the work from the 10th day. How many more days would they have taken together to complete the work?

a) 10 3/11 days  
b) 11 2/11 days  
c) 9 6/11 days  
d) 8 2/11 days

**Answer** : c) 9 6/11 days.

**Solution:**

Adhvaith can do 1/30 of the work in one day

In 9 days he would have completed - 9 x 1/30 = 3/10 of the work

Balance work = 1 - 3/10 = 7/10

Kashyap can do 1/25 of the work in one day

Work that can be done by Adhvaith and Kashyap in one day = (1/30 + 1/25) = 11/150 of the work.

So Adhvaith and Kashyap can complete 7/10 of the work in

7/10 x 150/11 = 105/11 = 9 6/11 days.

**Question 160**

A private limited company entrusts works to 20 men, working 12 hours a day. This group can complete the work in 24 days. The company now wants to entrust twice the work to 60 men working 4 hours a day. Assume that 2 men of the first group do as much work in one hour as 3 men of second group do in 1 ½ hours. How many number of days will the second group of men take to complete this work?

a) 108 days b) 120 days c) 124 days d) 81 days

**Answer** : a) 108 days

**Solution :**

Let efficiency of men in I group be E1 and that of second group be E2.

Ratios of efficiency of men in I group to that of II group can be found by using the formula,
\[
\frac{E1}{E2} = \text{Time taken by men in II group to do certain amount of work} / \text{Time taken by men in I group to do the same amount of work as that of men in II group}
\]
\[
= \frac{3 \times 1.5}{2 \times 1} = 4.5 : 2
\]

Now, \(M1D1T1E1W2 = M2D2T2E2W1\) --> 1

(where \(M1 = \text{number of men in I group}, M2 = \text{number of men in II group}, D1 = \text{number of days required to complete work by group I}, D2 = \text{number of days required to complete work by group II}, T1 = \text{working hours per day by group I}, T2 = \text{working hours per day by group II}, w2 = \text{amount of work by group II}, w1 = \text{amount of work by group I}.)

Since we are to calculate the time taken by group II to complete twice the amount of work as that of group I, \(W2 = 2 \times W1\).

We had earlier calculated \(\frac{E1}{E2} = 4.5/2\).

Also from the question we can infer that,

\(M1 = 20, \quad M2 = 60, \quad T1 = 12, \quad T2 = 4, \quad D1 = 24\) and \(D2\) is what we need to find.

Substituting all the values in eq 1, we can find \(D2\) as follows.

\[
D2 = \frac{20 \times 24 \times 12 \times 4.5 \times 2}{60 \times 4 \times 2 \times 1} = 108 \text{ days}.
\]

**Question 161**

Three persons Manmohan, Anna And Sushma working together, can do a job in \(X\) hours. When working alone, Manmohan needs an additional six hours to do the job; Anna, working alone needs an additional hour and Sushma working along needs \(X\) additional hours. What is the value of \(X\)?

\(a)\frac{2}{3} \quad b)\frac{3}{2} \quad c)\frac{11}{12} \quad d)2\)

**Answer : a)\frac{2}{3}**

**Solution :**

In this type of problems where answers cannot be easily found out using equations, it is advisable to go from the given answer choices. Based on information given one hour work done by all the three together =

\[
\frac{1}{X} + \frac{1}{X+6} + \frac{1}{X+1} + \frac{1}{2X} = \frac{1}{X}
\]

\(X\) is not known.

Using the data given

\[
\frac{1}{(2/3) + 6} + \frac{1}{(2/3) + 1} + \frac{1}{(4/3)} = \frac{1}{(2/3)}
\]

This comes out correctly. Whereas other values given in b), c) and d) do not get the result properly. Hence a) is correct.

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**Question 162**

If 40% of the people read newspaper X, 50% read newspaper Y and 10% read both the papers. What percentage of the people read neither newspaper?

a) 10%. b) 15%. c) 20%. d) 25%.

**Answer**: c) 20%.

**Reason**:

40% read newspaper X

50% read newspaper Y and out of this 10% read both X and Y

That means X alone is read by 30%,

Y alone is read by 40%

Both are read by 10%

People who read X alone + People who read Y alone + People who read both X and Y = 30% + 40% + 10% = 80%

This means the balance 20% don't read either of the newspapers.

**Question 163**

In a metropolitan city 25% neither watch TV news nor read newspaper, 35% read a newspaper and 20% read a newspaper and watch the news on television also. What percent of people watch Television?
a) 55% b) 60% c) 50% d) 40%

**Answer:** b) 60%.

**Reason:**

Let X% of people watch television.

People who read Newspaper – 35%

People who watch TV as well as read newspaper – 20%

From Venn diagram, we can infer that people who watch Television alone = (X-20)%

People who read Newspaper alone = 35% - 20% = 15%

People who neither watch TV nor newspaper is given as 25%. This means, people who watch either TV or Newspaper or Both = 100 - 25 = 75%

Also this 75% will be equal to People who watch TV alone + People who read Newspaper alone + People who watch TV and read Newspaper

Or 75% = (X-20)% + 15% + 20%

Or X = 60%

**Question 164**

Out of the total of 200 musicians in Rehman Music club, 10% can play all the three instruments- guitar, violin and flute. The number of musicians who can play any two and only two of the above instruments is 70. The number of musicians who can play the guitar alone is 80. What is the total number of those who can play violin alone or flute alone?
a) 20 b) 30 c) 40 d) 50

**Answer :** b) 30

**Reason :**

Number of people who can play all the three instruments = 10% of 200 = (10/100)200 = 20 (people in pink colored area)

Musicians who can play any two and only two of the three instruments - 70 (Sum of people in grey colored areas)

Number of musicians who can play Guitar alone = 80

Number of musicians who can play violin alone or flute alone = Sum of people in blue areas = 200 -170 = 30

**Question 165**

In a college of arts and science 96 students are seated in rows and columns in such a way that the number of students in each row is 50 % more than the number of students in each column. How many students are there in each row?

a) 7 b) 9 c) 12 d) 11

**Answer :** c) 12
Reason:

(These kinds of questions can be answered in two ways. Either by applying pure mathematical calculations or by applying pure logic considering the options given. But logical answering may not yield correct answers all the time as some questions may require mathematical solving for accurate answers when options are close to each other.)

In each row there are 50% more students than that of the columns. This means the number of students in each row should be divisible by 2 (Because 50% of any number can be found by dividing it by 2.)

Of the given choices c) alone satisfies this condition (As simple as that!)

**Question 166**

A secondary school student scored 31 marks in Science, 39 marks in mathematics, 28 marks in Hindi, 26 marks in Social studies and 36 marks in English. The maximum marks a student can score in each subject is 80. How much percentage did the student get in this examination?

a) 30%  b) 50%  c) 40%  d) 44%

**Answer:** c). 40%

Reason:

Student's total marks in all the subjects = 160. This is in five subjects.

Each subject carries 80 marks. Total maximum marks = 400

Hence, his percentage in the examination = (Student's total marks in all the subjects / Total maximum marks) X 100

\[
\frac{160}{400} \times 100 = 40\%
\]

**Question 167**

In a class of certain number of students, Kamal’s rank is tenth from the top. Ram is seven ranks below Kamal. Also Ram ranks 30th from bottom. What is the strength of the class.

a)47  b)57  c)28  d)46

**Answer:** a). 47

Reason:

Kamal is tenth rank from the top. Ram is seven ranks below Kamal. This means he is 17th rank from the top.
Let the number of students be x.

Ram's rank from bottom = Strength - Ram's Rank from top

Or 30 = x - 17

Or x = 47

Hence, strength of the class = 47.

**Question 168**

In a class of 50 students 26% students play only cricket, 18% students play only badminton, 10% students play only football. 20% students play only badminton and cricket, 12% students play only cricket and football and 8% students play only football and badminton, 6% students play all the three games. Totally how many students play cricket?

a)32 b) 24 c) 14 d)12

**Answer** : a)32

**Reason** :

Below Venn diagram represents percentage of students playing Cricket, Badminton and Football

You will find cricket is played by

26% + 20% + 6% + 12% = 64%
64% of 50 = 50 \times \frac{64}{100} = 32.

**Question 167**

Consider three people A, B, and C. Let A and B finish a job in 21 days, B and C in 14 days and A and C in 28 days. Who will take the least time when working independently?

Options: 1) A 2) B 3) C 4) Can't be determined

**Answer**

Correct answer is B

Consider WA, WB, and WC be the work done per day by A, B, and C respectively. Then

\[ WA + WB = \frac{1}{21} \text{ -- eq 1} \]
\[ WB + WC = \frac{1}{14} \text{ -- eq 2} \]
\[ WA + WC = \frac{1}{28} \text{ -- eq 3} \]

Eq 2 - Eq 3 will give

\[ WB - WA = \frac{1}{14} - \frac{1}{28} = \frac{1}{28} \text{ -- eq 4} \]

Eq 1 + Eq 4 will give

\[ 2WB = \frac{1}{21} + \frac{1}{28} = \frac{7}{84} \]
\[ WB = \frac{7}{168} \]

Sub value of WB in eq 1, we get

\[ WA = \frac{1}{21} - \frac{7}{168} = \frac{1}{168}. \]

Sub value of WA in eq 3, we get

\[ WC = \frac{1}{28} - WA = \frac{1}{28} - \frac{1}{168} = \frac{5}{168} \]

Since WB (work done by B per day) is greater when compared to WA and WB clearly B will be able to the maximum work on any given day and hence he should consume least amount of time when working independently.

**Question 168**
Consider two postmen A and B respectively. A is young and can deliver 20 parcels in 3 hours while B is older than A and can deliver only 15 parcels in 4 hours. If the total number of parcels to deliver is 60, how long they will take working together.

a. 121/12 hours  
b. 144/36 hours  
c. 144/25 hours  
d. 121/25 hours

**Answer**

Correct ans is option c. 144/25 hours.

A can deliver 20 parcels in 3 hours. Hence for 1 hour he can deliver 20/3 parcels.

B can deliver 15 parcel in 4 hours. Hence for 1 hour B needs 15/4 parcels.

When A and B work together, for 1 hour they can deliver, $\frac{20}{3} + \frac{15}{4}$ parcels = $\frac{80 + 45}{12}$ = $\frac{125}{12}$ parcels.

Hence to deliver 60 parcels they would require: $60 \times \frac{12}{125} = \frac{720}{125} = \frac{144}{25}$ hours

**Question 169**

Consider a courier company A which can deliver 100 parcels in 5 days with 5 men working for 8 hours a day. Consider another courier company B where every employee is equally efficient as that of company B. Company B is short of one man when compared to A and has a policy of asking its workers to work only for 6 hours a day. How long (in days) company B will take to deliver 100 parcels.

Options : a. 8.3  
b. 24  
c. 12  
d. 6.6

**Answer**

Correct answer is a. 8.3 days

Total amount of work $W = N \times D \times W$

where $N$ = number of men, $D$ = number of days, $W$ = amount of work per day

Applying the above formula for company A we get,

Work done by company A to deliver 100 parcels = $5 \times 5 \times 8 = 200$ -- eq 1

Work done by company B to deliver 100 parcels = $4 \times D \times 6 = 24D$ -- eq 2

Since the work to be done is same in both the cases, eq 1 = eq 2

or $200 = 24D$ or $D = 8.3$

**Question 170**
In software applications, especially in JAVA based applications, how design patterns help after a problem/requirement is identified?

Answer

Design pattern can be treated as a way or template to solve a problem depending upon the nature of the problem/requirement. Though they themselves cannot solve a problem, they provide greater insights into the best possible ways to solve them.

**Question 171**

Say two programs essentially dealing with solving same problem through similar algorithms. Let A be written using pointers and B be written using arrays. Which one will be memory efficient and which will be more readable.

Answer

A will be more memory efficient than B and B will be more readable than A. Reason: generally pointers are more memory efficient when used by an experienced programmer. And arrays are generally easily readable and can be easily understood by even beginner level programmer.

**Question 172**

What is the integrity constraint in SQL which when used ensures that values in a column of a table have a corresponding member on another column of another table.

Answer

Foreign Key is the answer (self explanatory as the question itself has got the explanation)

**Interview Question 173**

Consider a complex application involving several different programs communicating with each other. In this context, can you tell how unit testing is different from integration testing?

Answer

In the context of the given question, unit testing can be thought of as testing independent programs and integration testing can be thought of as testing the application as whole when programs interact with each other.

**Interview Question 174**

Can you tell a simple difference between FTP and SFTP protocols?

Answer
FTP is a file transfer protocol where entire data transmission is in the form of plain text and hence not secure. SFTP is another file transfer protocol, but unlike FTP, here the data transmission is encrypted.

**Interview Question 175**

What is the difference between design phase and build phase in software design?

*Answer*

Design phase will precede build phase and this is when algorithms, flowcharts etc are made. Build phase is actual coding phase.

**Interview Question 176**

Tell one good programming requirement that illustrates the fact that C is a strongly typed language?

*Answer*

C involves variable declarations before their usage. This makes it clear that C is strongly typed.

**Interview Question 177**

Consider a weather report application in C where any change in temperature by +/− 2 degrees will be constantly reported to the system and the application should store the times of the day when these changes took place. Which is a better data structure to be used in this scenario - an array or a linked list?

*Answer*

Linked List would handle dynamically growing data very well when compared to arrays. Hence it would be a better choice.

**Interview Question 178**

Can one use arrays to implement stacks or queues over linked lists? Is it feasible?

*Answer*

Thought linked lists are commonly used for implementing stacks or queues, with good programming logic, arrays can also be used to implement those. However, as you would expect, linked lists are far more efficient in this scenario.

**Interview / Placement Question 179**

Why there is a widespread usage of Unicode encoding when compared to ASCII encoding?
Unicode can be used for 16 bit or 32 bit encoding as against ASCII which is a 8 bit one. Hence the number of characters that can be represented by Unicode is huge (of the order of $2^{16}$). This also has made unicode to be used for several global languages other than English. This flexibility has resulted in larger usage of unicode.

**Interview / Placement Question 180**

Why J2EE is reduced to few classes in the form of J2ME when used in mobile devices ?

Answer

Mobile devices have serious limitations in memory and hardware capabilities. This is the reason for light weight versions of J2EE in the form of J2ME.

**Interview / Placement Question 181**

Tell one relative advantage and disadvantage of proprietary technologies as against open source technologies ?

Answer

proprietary technologies are generally well supported by the firms producing those. This is a significant advantage they have over open source technologies. On the other hand, the source code will not be available like open source, which reduces the flexibility in usage.

**Placement Question 182**

Find the missing number in 0,4,5,11,_

Answer

Answer is 14. Whenever you find a sequence like 0,4,5,11 with hardly any relation between adjacent numbers, it is a wiser to try adding and subtracting small numbers like 1 or 2 to all numbers. Now, alternatively adding 1 and subtracting 1 from each number of the sequence we get 1,3,6,10. This sequence has got a pattern!!!. The first digit "1" is the sum of first "1" natural numbers, the second digit "3" is the sum of first "2" natural numbers, the second digit "6" is the sum of first "3" natural numbers and so on.

Hence the final digit in the modified sequence would be 15 which is the sum of first 5 natural numbers. We need to subtract 1 from 15 so that it fits the sequence in question. Hence the answer is 14.

Note : This is one of the methods to solve this question. You could try other methods as well.
Placement Question 183

Find the missing number in the sequence 1,5,7,17,_

Answer

Just like question 1, this time let us start by adding and subtracting "1" alternatively from the numbers. Then we get, 2,4,8,16,_ . This has a pattern!!. Yes this is Geometric Progression with a ratio of 2. Hence the final digit would be 32. NOW subtracting 1 to this number we get 31, which is the correct answer.

Placement Question 184

Find the missing number in the sequence 0,2,1,4,_

Answer

Just like previous questions start by adding and subtracting "1" to the alternative numbers. We get 1,1,2,3,_ . Now, this is our famous good old Fibonacci Series!!!. Hence the final digit would be 5. Now we can fit this to the original sequence by subtracting "1" from "5". Hence correct answer is "4"

Interview Question 185

Can you say few differences between Unicode character encoding and that of ASCII.

Answer

Unicode uses 16 bits to encode characters and symbols whereas ASCII uses only 8 bits. Unicode has become a universal standard due to the fact that they can represent far great letters than ASCII. Unicode can be used hassle free to encode several regional languages other than English.

Interview Question 186

With reference to DBMS like Oracle or Sybase, can you tell the differences between shared and exclusive locks ?

Answer

Multiple transactions use shared locks during database read operations (SELECT Queries) as no data modification is involved. However if a transaction wants to change value of column/columns in single or multiple rows, it acquires an exclusive lock which will not be open to other transactions simultaneously.

Interview Question 187

Can you tell the primary difference between applets and conventional web applications ?
**Interview Question 188**

In the context of memory management schemes, can you tell a primary difference between swapping and paging?

**Answer**

Paging refers to writing and reading individual pages (fixed size) of a program to secondary memory (during program execution). Swapping refers to swap an entire program with another in secondary memory during heavy resource utilization.

**Placement Question 189**

Consider a string variable stroriginal holding a string value in its memory. Consider the following lines of C code.

```c
strcpy(strdummy,stroriginal);
strreversed = strrev(strdummy);
```

If stroriginal is a palindrome which of the following statements is true.

a) strcmp(stroriginal,strreversed) is 0  
b) strcmp(stroriginal,strrev(strreversed)) is 1  
c) strcmp(stroriginal,strreversed) is 1

**Answer 1**

Option a) is the right answer. If the string is a palindrome the strcmp will return 0 while comparing the original and the reversed string.

**Placement Question 190**

Consider the following lines of C code:

```c
int i,j,summ,lim;
i=0;
j=1;
for(lim = 1; lim <= 10; lim++)
{
    summ = j + i;
    i = j;
    j = sum;
    printf("%d",summ);
}
```
What kind of sequence the above code will generate?

a) Even Numbers  
b) Arithmetic Progression  
c) Fibonacci Series

Answer 2

The above code would generate option c) Fibonacci Series

**Placement Question 191**

State True or False. Recursion Type Programming can be used to generate Fibonacci series in C

Answer 3

True. Fibonacci series can be generated by recursion programming.

**Placement Question 192**

Ram travels by car from city A to city B heading towards north in 4 hours. From there he travels west to City C in 3 hours. Say his average speed is same during both the courses. Now from C he travels back to A in shortest path possible. How much time he would had taken to reach A from C.

Answer:

Again this is a very simple question which appears difficult. The entire course of Ram takes the form of a right angled triangle. Hence the time taken for him to travel back to A would be $\sqrt{3^2 + 4^2} = \sqrt{25} = 5$ hours.

**Placement Question 193**

A bacteria doubles itself each single day. It totally takes 15 days for the bacteria to fill a test tube. Find an approximate number of days for the bacteria to fill 1/3 of the jar.

Answer:

Though the question looks like a tough one, it is actually a simple question. If it takes 15 days for the bacteria to fill the entire test tube, on 14th day it would had filled half of the tube, on 13th day it would had filled a quarter of the tube and so on. Now 1/3th comes somewhere in middle between quarter and half filling of the tube. Hence the bacteria would need somewhere between 13 to 14 days to fill 1/3th of the jar.

194) My friend collects antique stamps. She purchased two, but found that she needed to raise money urgently. So she sold them for Rs. 8000 each. On one she made 20% and on the other she lost 20%. How much did she gain or lose in the entire transaction?
195) 12 members were present at a board meeting. Each member shook hands with all of the other members before & after the meeting. How many hand shakes were there?

**Answer**

132

196) An emergency vehicle travels 10 miles at a speed of 50 miles per hour. How fast must the vehicle travel on the return trip if the round-trip travel time is to be 20 minutes?

**Answer**

75 miles per hour

197) All of the students at a college are majoring in psychology, business, or both. 73% of the students are psychology majors, & 62% are business majors. If there are 200 students, how many of them are majoring in both psychology & business?

**Answer**

70 students are majoring in both, psychology & business

198) Grass in lawn grows equally thick and in a uniform rate. It takes 24 days for 70 cows and 60 for 30 cows. How many cows can eat away the same in 96 days?

**Answer**

18 or 19

199) There is a certain four digit number whose fourth digit is twice the first digit. The third digit is three more than second digit. Sum of the first and fourth digits is twice the third number. What was that number?

**Answer**

2034 and 4368

200) A thief steals half the total no of loaves of bread plus 1/2 loaf from a backery. A second thief steals half the remaining no of loaves plus 1/2 loaf and so on. After the 5th thief has stolen there are no more loaves left in the backery. What was the total no of loaves did the backery have at the beginning?

**Answer**

31

201) A person needs 6 steps to cover a distance of one slab. If he increases his foot length (step length) by 3 inches he needs only 5 steps to cover the slabs length. What is the length of the each slab?

**Answer**

31 inches
202) There is one lily in the pond on 1st june. There are two in the pond on 2nd june. There are four on 3rd june and so on. The pond is full with lilies by the end of the june. (i) On which date the pond is half full. Ans. 29th. (ii) If we start with 2 lilies on 1st june when will be the pond be full with lilies?

Ans: 29th june

203) A lorry starts from Banglore to Mysore at 6.00 A.M, 7.00 am, 8.00 am, .... 10 pm. Similarly one another starts from Mysore to Banglore at 6.00 am, 7.00 am, 8.00 am, .... 10.00pm. A lorry takes 9 hours to travel from Banglore to Mysore and vice versa. (i) A lorry which has started at 6.00 am. will cross how many lorries. (ii) A lorry which had started at 6.00 pm. will cross how many lorries.

Ans: (i) 10 lorries (ii) 14 lorries

204) There is an element which triplicates in every hour. Each of these 3 items inturn reproduce exactly 3 other items. If a single compound is kept in a container at noon and the container is full by midnight. After how many hours is the container 1/3 full?

Ans: 11:00pm

205) A person goes to a bank and Quotes x Rs and y paise on a cheque. The cashier misreads it and gives y Rs and x paise. The man comes out and donates 5 paise to a begger. Now, the man has exactly double the amount he has quoted on the cheque.

Ans: 31 Rs. and 63 paise.

206. A garrison of 3300 men has provisions for 32 days, when given at a rate of 850 grams per head. At the end of 7 days a reinforcement arrives and it was found that now the provisions will last 8 days less, when given at the rate of 825 grams per head. How, many more men can it feed?

Ans. 1700 men.

207) From 5 different green balls, four different blue balls and three different red balls, how many combinations of balls can be chosen taking at least one green and one blue ball?

Ans. 3720.
208) Three pipes, A, B, & C are attached to a tank. A & B can fill it in 20 & 30 minutes respectively while C can empty it in 15 minutes. If A, B & C are kept open successively for 1 minute each, how soon will the tank be filled?

Ans. 167 minutes.

209) A person walking 5/6 of his usual rate is 40 minutes late. What is his usual time?

Ans. 3 hours 20 minutes.

210) A garrison of 3300 men has provisions for 32 days, when given at a rate of 850 grams per head. At the end of 7 days a reinforcement arrives and it was found that now the provisions will last 8 days less, when given at the rate of 825 grams per head. How, many more men can it feed?

Ans. 1700 men.

211) From 5 different green balls, four different blue balls and three different red balls, how many combinations of balls can be chosen taking at least one green and one blue ball?

Ans. 3720.

212) Three pipes, A, B, & C are attached to a tank. A & B can fill it in 20 & 30 minutes respectively while C can empty it in 15 minutes. If A, B & C are kept open successively for 1 minute each, how soon will the tank be filled?

Ans. 167 minutes.

213) A person walking 5/6 of his usual rate is 40 minutes late. What is his usual time?

Ans. 3 hours 20 minutes.

214) The minute hand of a clock overtakes the hour hand at intervals of 64 minutes of correct time. How much a day does the clock gain or lose?

Ans. 32 8/11 minutes.

215) Solve for x and y: \( \frac{1}{x} - \frac{1}{y} = \frac{1}{3}, \frac{1}{x^2} + \frac{1}{y^2} = \frac{5}{9} \).

Ans. \( x = \frac{3}{2} \) or \(-3\) and \( y = 3 \) or \(-\frac{3}{2}\).
216) Daal is now being sold at Rs. 20 a kg. During last month its rate was Rs. 16 per kg. By how much percent should a family reduce its consumption so as to keep the expenditure fixed?

*Ans. 20 %.*

217) Find the least value of $3x + 4y$ if $x^2y^3 = 6$.

Ans. 10.

218) Find the sum of the first 14 terms for a sequence starting with 2, ending with 120 and common difference 2

a) 845
b) 854
c) 800

*Answer is 854*

219) Find the 10th element in the series 5, 15, 35, 45…. 

a) 85
b) 95
c) Cannot be determined

*Answer is Cannot be determined*

220) Find the difference between last and last but one term in the sequence 1, 9, 17, 25… which has 40 terms in total

a) 8
b) 16
c) 24

*Answer is 8*

221) Find the 7th term in the series 4, 8, 16…

a) 512
b) 256
c) 64

*Answer is 256*
222) The average heights of three poles x, y, z is 45 cms. If average height of x and y is 40 cm and that of y and z is 43 cm, can you find the height of the second pole y.

a) 30 cms  
b) 31 cms  
c) Cannot be determined

Answer: Sum of heights of three poles x, y and z = 45 x 3 = 135 cms = x + y + z
However, x + y = 2 x 40 cms = 80 cms and y + z = 2 x 43 cms = 86 cms
Solving the three equations we can get y = 31 cms

223) Find the average of first 10 odd numbers starting from 3.

a) 11  
b) 12  
c) 24

Answer:
Odd numbers form an arithmetic progression of the form, a, a+d, a+2d....., where a = 3 and d = 2.
Average of n numbers in AP = (2a + (n - 1)d) / 2. Therefore average of first 10 numbers is obtained by
substituting n = 10 in the above formula. We will get the answer 12.

Find 3 solved questions from Averages section.
224) Find the average of first 20 natural numbers

a) 10.5  
b) 20.5  
c) 15

Answer:
Sum of first n natural numbers = n(n + 1)/2
Therefore sum of first 20 natural numbers = 20(21)/2 = 210
Average = 210/20 = 10.5

225) In a classroom, average weight of 4 students was 60 Kgs. A new entrant, Rahim, increased the average to 62.

Then can you find the weight of Rahim?
a) 65  
b) 70  
c) Cannot be determined

Answer: Since the average weight of 4 students was 60 Kgs, their total weights added = 4 x 60 = 240 Kgs  
Let x be Rahim's weight. Then new average = (240 + x)/5 = 62  
240 + x = 310. Therefore x = Rahim's weight = 70 Kgs.

226) Find the average of first 10 numbers in the series - 1,4,7.....

a) 14.5  
b) 12.5  
c) 10.5

Answer: The given sequence is in the form of AP (arithmetic progression).  
Consider an AP : a, (a + d), (a + 2d), (a + 3d),(a + 4d),....  
Sum to n no of terms Sn = n / 2 (2a + (n - 1)d)  
Average of n numbers in an AP = Sn/n = (2a + (n - 1)d)/2  
Substituting a = 1, d = 3 and n = 10, we get average = 14.5 by above formula

227) Find the 10th element in the series 5,15,35,45.....

Choices :  a) 95  b) 85  c) Cannot be determined

Correct Answer: c) Cannot be determined  
Reason: The given sequence is not in arithmetic progression. The difference between third and second elements is 20 whereas between second and first element is 10. Hence correct answer is "Cannot be determined"

228) Find the odd man out

Choices : a)3,6,9,12  b)2,4,8,16  c)12,24,36,48  d)10,13,16,19
Correct Answer: b) 2,4,8,16

Reason: The second sequence 2,4,8,16 is in geometric progression and not in arithmetic progression. Hence the answer is 2,4,6,8

229) Find the sum of the first 14 terms for a sequence starting with 2, ending with 120 and common difference 2

Choices : a)845  b)854  c)800

Correct Answer: b)854
Reason: By applying the formula Sum to n no of terms = \( S_n = \frac{n}{2}(a + l) \) where a is the first number and l is the last number of the series, we can get the answer 854.

230) Find the difference between last and last but one term in the Sequence 1, 9, 17, 25… which has 40 terms in total

Choices: a)8    b)16    c)24

Correct Answer: a)8

Reason: Since the sequence is in an arithmetic progression the difference between any two successive terms is always the same as the difference between any other two successive terms.
Hence correct answer is 8.

231) Find the 7th term in the series 4,8,16…

Choices: a)512    b)256    c)64

Correct Answer: b)256

Reason: \( n^{\text{th}} \) term of a geometric progression can be found by using the formula \( T_n = ar^{n-1} \). In the given series \( a = 4, r = 2 \) and \( n = 2 \). Hence \( T_7 = 4 \times 2^6 = 256 \)
The correct answer is 256

232) Find the sum of the first 5 terms in 3,9,27

Choices: a)363    b)121    c)242

Correct Answer: a)363

Reason: Sum to n no of terms in a geometric progression is \( S_n = a(1 - r^n)/(1-r) \). Applying \( a = 3, n = 5 \) and \( r = 3 \) we get \( S_5 = 3(1 - 3^5)/(1 - 3) = 363 \). Hence the correct answer is 363.

233) Find the odd man out

3,9,27
2,4,8
10,20,40
1,1/2,1/4
Choices: a)3,9,27  b) 2,4,8  c)10,20,40  d)1,1//2,1/4

Correct Answer: d)1,1/2,1/4

Reason: All the four sequences are in geometric progression. However the last series 1,1//2,1/4 is an infinite series. This is because the common ratio for this series, which is 1/2 is lesser than 1.
Hence the correct answer is 1,1//2,1/4

234) If 2x-y=4 then 6x-3y=?
(a)15  
(b)12  
(c)18  
(d)10

Ans. (b)

235) If x=y=2z and xyz=256 then what is the value of x?
(a)12  
(b)8  
(c)16  
(d)6

Ans. (b)

236) (1/10)18 - (1/10)20 = ?
(a) 99/1020  
(b) 99/10  
(c) 0.9  
(d) none of these

Ans. (a)

237) Pipe A can fill in 20 minutes and Pipe B in 30 mins and Pipe C can empty the same in 40 mins. If all of them work together, find the time taken to fill the tank
(a) 17 1/7 mins  
(b) 20 mins  
(c) 8 mins  
(d) none of these

Ans. (a)

238) Thirty men take 20 days to complete a job working 9 hours a day. How many hour a day should 40 men work to complete the job?
(a) 8 hrs  
(b) 7 1/2 hrs  
(c) 7 hrs
239) Find the smallest number in a GP whose sum is 38 and product 1728

(a) 12
(b) 20
(c) 8
(d) none of these

Ans. (c)

240) A boat travels 20 kms upstream in 6 hrs and 18 kms downstream in 4 hrs. Find the speed of the boat in still water and the speed of the water current?

(a) 1/2 kmph
(b) 7/12 kmph
(c) 5 kmph
(d) none of these

Ans. (b)

241) A goat is tied to one corner of a square plot of side 12m by a rope 7m long. Find the area it can graze?

(a) 38.5 sq.m
(b) 155 sq.m
(c) 144 sq.m
(d) 19.25 sq.m

Ans. (a)

242) Mr. Shah decided to walk down the escalator of a tube station. He found that if he walks down 26 steps, he requires 30 seconds to reach the bottom. However, if he steps down 34 stairs he would only require 18 seconds to get to the bottom. If the time is measured from the moment the top step begins to descend to the time he steps off the last step at the bottom, find out the height of the stair way in steps?

Ans. 46 steps.

243) The average age of 10 members of a committee is the same as it was 4 years ago, because an old member has been replaced by a young member. Find how much younger is the new member?

Ans. 40 years.

244. ABCE is an isosceles trapezoid and ACDE is a rectangle. AB = 10 and EC = 20. What is the length of AE?

Ans. AE = 10.

In the given figure, PA and PB are tangents to the circle at A and B respectively and the chord BC is parallel to tangent PA. If AC = 6 cm, and length of the tangent AP is 9 cm, then what is the length of the chord BC?

Ans. BC = 4 cm.
245. Three cards are drawn at random from an ordinary pack of cards. Find the probability that they will consist of a king, a queen and an ace.  
Ans. 64/2210.  
246. A number of cats got together and decided to kill between them 999919 mice. Every cat killed an equal number of mice. Each cat killed more mice than there were cats. How many cats do you think there were?  
Ans. 991.  
247. If Log2 x - 5 Log x + 6 = 0, then what would the value / values of x be?  
Ans. x = e2 or e3.  
248. The square of a two digit number is divided by half the number. After 36 is added to the quotient, this sum is then divided by 2. The digits of the resulting number are the same as those in the original number, but they are in reverse order. The ten's place of the original number is equal to twice the difference between its digits. What is the number?  
Ans. 46  
249. Can you tender a one rupee note in such a manner that there shall be total 50 coins but none of them would be 2 paise coins.?  
Ans. 45 one paisa coins, 2 five paisa coins, 2 ten paisa coins, and 1 twenty-five paise coins.  
250. A monkey starts climbing up a tree 20ft. tall. Each hour, it hops 3ft. and slips back 2ft. How much time would it take the monkey to reach the top?  
Ans. 18 hours.  
251. What is the missing number in this series?  
8 2 14 6 11 ? 14 6 18 12  
Ans. 9  
252. A certain type of mixture is prepared by mixing brand A at Rs.9 a kg. with brand B at Rs.4 a kg. If the mixture is worth Rs.7 a kg., how many kgs. of brand A are needed to make 40kgs. of the mixture?  
Ans. Brand A needed is 24kgs.  
253. A wizard named Nepo says "I am only three times my son's age. My father is 40 years more than twice my age. Together the three of us are a mere 1240 years old." How old is Nepo?  
Ans. 360 years old.  
254. One dog tells the other that there are two dogs in front of me. The other one also shouts that he too had two behind him. How many are they?  
Ans. Three.  
255. A man ate 100 bananas in five days, each day eating 6 more than the previous day. How many bananas did he eat on the first day?  
Ans. Eight.  
256. If it takes five minutes to boil one egg, how long will it take to boil four eggs?  
Ans. Five minutes.  
257. The minute hand of a clock overtakes the hour hand at intervals of 64 minutes of correct time. How much a day does the clock gain or lose?
Ans. 32 8/11 minutes.

258. Solve for x and y: \( \frac{1}{x} - \frac{1}{y} = \frac{1}{3}, \frac{1}{x^2} + \frac{1}{y^2} = \frac{5}{9} \).

Ans. \( x = \frac{3}{2} \) or \(-3\) and \( y = 3 \) or \(-3/2\).

259. Daal is now being sold at Rs. 20 a kg. During last month its rate was Rs. 16 per kg. By how much percent should a family reduce its consumption so as to keep the expenditure fixed?

Ans. 20 %.

260. Find the least value of \( 3x + 4y \) if \( x^2y^3 = 6 \).

Ans. 10.

261. Can you find out what day of the week was January 12, 1979?

Ans. Friday.

262. A garrison of 3300 men has provisions for 32 days, when given at a rate of 850 grams per head. At the end of 7 days a reinforcement arrives and it was found that now the provisions will last 8 days less, when given at the rate of 825 grams per head. How, many more men can it feed?

Ans. 1700 men.

263. From 5 different green balls, four different blue balls and three different red balls, how many combinations of balls can be chosen taking at least one green and one blue ball?

Ans. 3720.

264. Three pipes, A, B, & C are attached to a tank. A & B can fill it in 20 & 30 minutes respectively while C can empty it in 15 minutes. If A, B & C are kept open successively for 1 minute each, how soon will the tank be filled?

Ans. 167 minutes.

265. A person walking \( \frac{5}{6} \) of his usual rate is 40 minutes late. What is his usual time?

Ans. 3 hours 20 minutes.

266. For a motorist there are three ways going from City A to City C. By way of bridge the distance is 20 miles and toll is $0.75. A tunnel between the two cities is a distance of 10 miles and toll is $1.00 for the vehicle and driver and $0.10 for each passenger. A two-lane highway without toll goes east for 30 miles to city B and then 20 miles in a northwest direction to City C.

**267. Which is the shortest route from B to C**

(a) Directly on toll free highway to City C
(b) The bridge
(c) The Tunnel
(d) The bridge or the tunnel
(e) The bridge only if traffic is heavy on the toll free highway
268. The most economical way of going from City A to City B, in terms of toll and distance is to use the
(a) tunnel
(b) bridge
(c) bridge or tunnel
(d) toll free highway
(e) bridge and highway

Ans. (a)

269. Jim usually drives alone from City C to City A every working day. His firm deducts a percentage of employee pay for lateness. Which factor would most influence his choice of the bridge or the tunnel?
(a) Whether his wife goes with him
(b) scenic beauty on the route
(c) Traffic conditions on the road, bridge and tunnel
(d) saving $0.25 in tolls
(e) price of gasoline consumed in covering additional 10 miles on the bridge

Ans. (a)

270. In choosing between the use of the bridge and the tunnel the chief factor(s) would be:
I. Traffic and road conditions
II. Number of passengers in the car
III. Location of one's homes in the center or outskirts of one of the cities
IV. Desire to save $0.25

(a) I only
(b) II only
(c) II and III only
(d) III and IV only
(e) I and II only

Ans. (a)

271. The letters A, B, C, D, E, F and G, not necessarily in that order, stand for seven consecutive integers from 1 to 10
D is 3 less than A
B is the middle term
F is as much less than B as C is greater than D
G is greater than F

1. The fifth integer is
(a) A
2. A is as much greater than F as which integer is less than G
   (a) A  
   (b) B  
   (c) C  
   (d) D  
   (e) E  
   Ans. (a)

3. If A = 7, the sum of E and G is
   (a) 8  
   (b) 10 
   (c) 12 
   (d) 14 
   (e) 16 
   Ans. (a)

4. A - F = ?
   (a) 1  
   (b) 2  
   (c) 3  
   (d) 4  
   (e) Cannot be determined 
   Ans. (a)

5. An integer T is as much greater than C as C is greater than E. T can be written as A + E. What is D?
   (a) 2  
   (b) 3  
   (c) 4  
   (d) 5  
   (e) Cannot be determined 
   Ans. (a)

271. The greatest possible value of C is how much greater than the smallest possible value of D?
   (a) 2  
   (b) 3  
   (c) 4  
   (d) 5  
   (e) 6  
   Ans. (a)
In country X, democratic, conservative and justice parties have fought three civil wars in twenty years. To restore stability an agreement is reached to rotate the top offices President, Prime Minister and Army Chief among the parties so that each party controls one and only one office at all times. The three top office holders must each have two deputies, one from each of the other parties. Each deputy must choose a staff composed of equally members of his or her chiefs party and member of the third party.

272. When Justice party holds one of the top offices, which of the following cannot be true
(a) Some of the staff members within that office are justice party members
(b) Some of the staff members within that office are democratic party members
(c) Two of the deputies within the other offices are justice party members
(d) Two of the deputies within the other offices are conservative party members
(e) Some of the staff members within the other offices are justice party members.

Ans. (a)

273. When the democratic party holds presidency, the staff of the prime minister's deputies are composed
I. One-fourth of democratic party members
II. One-half of justice party members and one-fourth of conservative party members
III. One-half of conservative party members and one-fourth of justice party members.

(a) I only
(b) I and II only
(c) II or III but not both
(d) I and II or I and III
(e) None of these

Ans. (a)

274. Which of the following is allowable under the rules as stated:
(a) More than half of the staff within a given office belonging to a single party
(b) Half of the staff within a given office belonging to a single party
(c) Any person having a member of the same party as
his or her immediate superior
(d) Half the total number of staff members in all three offices belonging to a single party
(e) Half the staff members in a given office belonging to parties different from the party of the top office holder in that office.

Ans. (a)

275. **The office of the Army Chief passes from Conservative to Justice party. Which of the following must be fired.**
(a) The democratic deputy and all staff members belonging to Justice party
(b) Justice party deputy and all his or hers staff members
(c) Justice party deputy and half of his Conservative staff members in the chief of staff office
(d) The Conservative deputy and all of his or her staff members belonging to Conservative party
(e) No deputies and all staff members belonging to conservative parties.

Ans. (a)

276. In recommendations to the board of trustees a tuition increase of $500 per year, the president of the university said "There were no student demonstrations over the previous increases of $300 last year and $200 the year before". If the president's statement is accurate then which of the following can be validly inferred from the information given:
I. Most students in previous years felt that the increases were justified because of increased operating costs.
II. Student apathy was responsible for the failure of students to protest the previous tuition increases.
III. Students are not likely to demonstrate over new tuition increases.

(a) I only
(b) II only
(c) I or II but not both
(d) I, II and III
(e) None

Ans. (a)

277. The office staff of XYZ corporation presently consists of three bookeepers--A, B, C and 5 secretaries D, E, F, G, H. The management is planning to open a new office in another city using 2 bookeepers and 3 secretaries of the present staff. To do so they plan to separate certain individuals who don't function well together. The following guidelines were
established to set up the new office
I. Bookeepers A and C are constantly finding fault with one another and should not be sent together to the new office as a team
II. C and E function well alone but not as a team, they should be separated
III. D and G have not been on speaking terms and shouldn't go together
IV Since D and F have been competing for promotion they shouldn't be a team

If A is to be moved as one of the bookeepers, which of the following cannot be a possible working unit.

A. ABDEH  
B. ABDGH  
C. ABEFH  
D. ABEGH

Ans. B

If C and F are moved to the new office, how many combinations are possible
A. 1  
B. 2  
C. 3  
D. 4

Ans. A

If C is sent to the new office, which member of the staff cannot go with C
A. B  
B. D  
C. F  
D. G

Ans. B

Under the guidelines developed, which of the following must go to the new office
A. B  
B. D  
C. E  
D. G

Ans. A

If D goes to the new office, which of the following is/are true
I. C cannot go  
II. A cannot go  
III. H must also go
A. I only  
B. II only  
C. I and II only  
D. I and III only  

Ans. D

278. After months of talent searching for an administrative assistant to the president of the college the field of applicants has been narrowed down to 5--A, B, C, D, E. It was announced that the finalist would be chosen after a series of all-day group personal interviews were held. The examining committee agreed upon the following procedure

I. The interviews will be held once a week  
II. 3 candidates will appear at any all-day interview session  
III. Each candidate will appear at least once  
IV. If it becomes necessary to call applicants for additional interviews, no more 1 such applicant should be asked to appear the next week  
V. Because of a detail in the written applications, it was agreed that whenever candidate B appears, A should also be present.  
VI. Because of travel difficulties it was agreed that C will appear for only 1 interview. >

At the first interview the following candidates appear A, B, D. Which of the following combinations can be called for the interview to be held next week.

A. BCD  
B. CDE  
C. ABE  
D. ABC

Ans. B

Which of the following is a possible sequence of combinations for interviews in 2 successive weeks

A. ABC; BDE  
B. ABD; ABE  
C. ADE; ABC  
D. BDE; ACD

Ans. C

If A, B and D appear for the interview and D is called for additional interview the following week, which 2 candidates may be asked to appear with D?

I. A  
II B
III.C
IV.E
A.I and II
B.I and III only
C.II and III only
D.III and IV only

Ans.D
Which of the following correctly state(s) the procedure followed by the search committee
I. After the second interview all applicants have appeared at least once
II. The committee sees each applicant a second time
III. If a third session, it is possible for all applicants to appear at least twice

A. I only
B. II only
C. III only
D. Both I and II

Ans. A

279. A certain city is served by subway lines A, B and C and numbers 1, 2 and 3. When it snows, morning service on B is delayed. When it rains or snows, service on A, 2 and 3 are delayed both in the morning and afternoon. When temp. falls below 30 degrees Fahrenheit, afternoon service is cancelled in either the A line or the 3 line, but not both. When the temperature rises over 90 degrees Fahrenheit, the afternoon service is cancelled in either the line C or the 3 line but not both. When the service on the A line is delayed or cancelled, service on the C line which connects the A line, is delayed. When service on the 3 line is cancelled, service on the B line which connects the 3 line is delayed.

On Jan 10th, with the temperature at 15 degrees Fahrenheit, it snows all day. On how many lines will service be affected, including both morning and afternoon.
(A) 2
(B) 3
(C) 4
(D) 5
Ans. D

On Aug 15th with the temperature at 97 degrees Fahrenheit it begins to rain at 1 PM. What is the minimum number of lines on which service will be affected?
(A) 2
(B) 3
(C) 4
(D) 5
Ans. C

On which of the following occasions would service be on the greatest number of lines disrupted.
(A) A snowy afternoon with the temperature at 45 degree farenheit
(B) A snowy morning with the temperature at 45 degree farenheit
(C) A rainy afternoon with the temperature at 45 degree farenheit
(D) A rainy afternoon with the temperature at 95 degree farenheit
Ans. B

280. In a certain society, there are two marriage groups, red and brown. No marriage is permitted within a group. On marriage, males become part of their wives groups; women remain in their own group. Children belong to the same group as their parents. Widowers and divorced males revert to the group of their birth. Marriage to more than one person at the same time and marriage to a direct descendant are forbidden

Q1. A brown female could have had
I. A grandfather born Red
II. A grandmother born Red
III. Two grandfathers born Brown
(A) I only
(B) III only
(C) I, II and III
(D) I and II only
Ans. D

Q2. A male born into the brown group may have
(A) An uncle in either group
(B) A brown daughter
(C) A brown son
(D) A son-in-law born into red group
Ans. A

Q3. Which of the following is not permitted under the rules as stated.
(A) A brown male marrying his father's sister
(B) A red female marrying her mother's brother
(C) A widower marrying his wife's sister
(D) A widow marrying her divorced daughter's ex-husband
Ans. B

Q4. If widowers and divorced males retained their group they had upon marrying which of the following would be permissible (Assume that no previous marriage occurred)
(A) A woman marrying her dead sister's husband
(B) A woman marrying her divorced daughter's ex-husband
(C) A widower marrying his brother's daughter
(D) A woman marrying her mother's brother who is a widower.
281. There are six steps that lead from the first to the second floor. No two people can be on the same step. Mr. A is two steps below Mr. C. Mr. B is a step next to Mr. D. Only one step is vacant (No one standing on that step.) Denote the first step by step 1 and second step by step 2 etc.

1. If Mr. A is on the first step, Which of the following is true?
   (a) Mr. B is on the second step
   (b) Mr. C is on the fourth step.
   (c) A person Mr. E, could be on the third step
   (d) Mr. D is on higher step than Mr. C.

   Ans: (d)

2. If Mr. E was on the third step & Mr. B was on a higher step than Mr. E which step must be vacant
   (a) step 1
   (b) step 2
   (c) step 4
   (d) step 5
   (e) step 6

   Ans: (a)

3. If Mr. B was on step 1, which step could A be on?
   (a) 2 & e only
   (b) 3 & 5 only
   (c) 3 & 4 only
   (d) 4 & 5 only
   (e) 2 & 4 only

   Ans: (c)

4. If there were two steps between the step that A was standing and the step that B was standing on, and A was on a higher step than D, A must be on step
   (a) 2
   (b) 3
   (c) 4
   (d) 5
   (e) 6

   Ans: (c)

5. Which of the following is false
   i. B&D can be both on odd-numbered steps in one configuration
   ii. In a particular configuration A and C must either both an odd numbered steps or both an even-numbered steps
   iii. A person E can be on a step next to the vacant step.
(a) i only
(b) ii only
(c) iii only
(d) both i and iii
Ans: (c)

282. Six swimmers A, B, C, D, E, F compete in a race. The outcome is as follows.
i. B does not win.
ii. Only two swimmers separate E & D
iii. A is behind D & E
iv. B is ahead of E, with one swimmer intervening
v. F is a head of D

1. Who stood fifth in the race?
(a) A
(b) B
(c) C
(d) D
(e) E
Ans: (e)

2. How many swimmers separate A and F?
(a) 1
(b) 2
(c) 3
(d) 4
(e) cannot be determined
Ans: (d)

3. The swimmer between C & E is
(a) none
(b) F
(c) D
(d) B
(e) A
Ans: (a)

4. If the end of the race, swimmer D is disqualified by the Judges then swimmer B finishes in which place
(a) 1
(b) 2
(c) 3
(d) 4
(e) 5
Ans: (b)
Five houses lettered A, B, C, D, & E are built in a row next to each other. The houses are lined up in the order A, B, C, D, & E. Each of the five houses has a colored chimney. The roof and chimney of each house must be painted as follows.

i. The roof must be painted either green, red, or yellow.
ii. The chimney must be painted either white, black, or red.
iii. No house may have the same color chimney as the color of roof.
iv. No house may use any of the same colors that the every next house uses.
v. House E has a green roof.
vi. House B has a red roof and a black chimney

1. Which of the following is true?
(a) At least two houses have black chimney.
(b) At least two houses have red roofs.
(c) At least two houses have white chimneys
(d) At least two houses have green roofs
(e) At least two houses have yellow roofs

Ans: (c)

2. Which must be false?
(a) House A has a yellow roof
(b) House A & C have different color chimney
(c) House D has a black chimney
(d) House E has a white chimney
(e) House B&D have the same color roof.

Ans: (b)

3. If house C has a yellow roof. Which must be true.
(a) House E has a white chimney
(b) House E has a black chimney
(c) House E has a red chimney
(d) House D has a red chimney
(e) House C has a black chimney

Ans: (a)

4. Which possible combinations of roof & chimney can house
I. A red roof 7 a black chimney
II. A yellow roof & a red chimney
III. A yellow roof & a black chimney

(a) I only
(b) II only
(c) III only
(d) I & II only
(e) I&II&III
Find $x+2y$
(i). $x+y=10$
(ii). $2x+4y=20$

Ans: (b)

Is angle BAC is a right angle
(i) $AB=2BC$
(ii) $BC=1.5AC$

Ans: (e)

Is $x$ greater than $y$
(i) $x=2k$
(ii) $k=2y$

Ans: (e)
4. GENERAL KNOWLEDGE

1. The speed of light with the rise in the temperature of the medium
   (1) Increases
   (2) Decreases
   (3) Remains unaltered
   (4) Drops sharply

   Ans: 3

2. Which from the following rivers does not originate in Indian territory?
   (1) Mahanadi
   (2) Brahmaputra
   (3) Ravi
   (4) Chenab

   Ans: 2
3. The gas predominantly responsible for global warming is
(1) Carbon dioxide
(2) Carbon monoxide
(3) Nitrous oxide
(4) Nitrogen peroxide
Ans: 1

4. 26th January is India’s
(1) Independence Day
(2) Republic Day
(3) Revolution Day
(4) Parliament Day
Ans: 2

5. Which of the following uses non-conventional Source of Energy?
(1) Kerosene lamp
(2) Wax candle
(3) Solar lantern
(4) Torch
Ans: 3

6. Electric current is measured by
(1) Voltmeter
(2) Anemometer
(3) Commutator
(4) Ammeter
Ans: 4

7. The dynamo is a device for converting
(1) Heat energy into electrical energy
(2) Mechanical energy into electrical energy
(3) Magnetic energy into electrical energy
(4) None of these
Ans: 2

8. Galvanised Iron sheets have a coating of
(1) Tin
(2) Lead
(3) Zinc
(4) Chromium
Ans: 3
9. The hardest substance available on earth is
(1) Platinum
(2) Diamond
(3) Quartz
(4) gold

Ans: 1

10. Washing soda is the common name for
(1) Calcium carbonate
(2) Calcium bicarbonate
(3) Sodium carbonate
(4) Sodium bicarbonate

Ans: 3

11. 2008 Olympic games were held in
(1) China
(2) Greece
(3) Italy
(4) France

Ans: 1

12. Who among the following has been appointed as the new Captain of Indian Test Cricket Team?
(1) Sachin Tendulkar
(2) Rahul Dravid
(3) Anil Kumble
(4) Mahender Singh Dhoni

Ans: 4

13. Who among the following is coach for the Indian Cricket Team?
(1) Vivian Richards
(2) Gary Kirsten
(3) Kapil Dev
(4) Allan Border

Ans: 2

14. The mascot for the 34th National Games held in Jharkhand in 2008, is
(1) Sheru
(2) Roopa
(3) Chauva
(4) None of these

Ans: 3
15. With which game is the Agha Khan Cup associated?
(1) Football
(2) Badminton
(3) Basketball
(4) Hockey

Ans: 4

16. The term, L.B.W. is associated with which of the following games?
(1) Cricket
(2) Hockey
(3) Football
(4) Polo

Ans: 1

17. Wankhede stadium is situated in?
(1) Chandigarh
(2) Bangalore
(3) Mumbai
(4) Chennai

Ans: 3

18. The Olympic games are normally held at an interval of
(1) 2 years
(2) 3 years
(3) 4 years
(4) 5 years

Ans: 3

19. Jaspal Rana is the name associated with which of the following games?
(1) Boxing
(2) Shooting
(3) Archery
(4) Weight lifting

Ans: 2

20. Netaji Subhash National Institute of Sports is located at
(1) Kolkata
(2) New Delhi
(3) Jhansi
(4) Patiala

Ans: 4
21. A person wants to contest election for the membership of Gram Panchayat, what should be his age?
(1) 18 years or above
(2) 19 years or above
(3) 21 years of above
(4) Minimum 25 years
Ans: 3

22. Who summons the joint sitting of the Rajya Sabha and Lok Sabha?
(1) President
(2) Speaker of the Lok Sabha
(3) Chairman of the Rajya Sabha
(4) Prime Minister
Ans: 1

23. Which of the following is not a source of revenue to the village panchayat?
(1) Property Tax
(2) House Tax
(3) Land Tax
(4) Vehicle Tax
Ans: 3

24. All electioneering campaigns during the time of elections are stopped.
(1) 48 hours before the appointed time of election results
(2) 48 hours before the actual poll
(3) 24 hours before the actual poll
(4) 36 hours before the actual poll
Ans: 4

25. Who appoints the Chief Election Commissioner of India?
(1) President
(2) Prime Minister
(3) Parliament
(4) Chief Justice of India
Ans: 1

26. The General Budget is presented in the parliament normally in the month of
(1) January
(2) February
(3) March
(4) Last month of the year
Ans: 2
27. Who is the signatory on the Indian currency notes in denomination of two rupees and above?
(1) Secretary, Reserve Bank of India
(2) Finance Secretary, Minister of Finance
(3) Governor, Reserve Bank of India
(4) Finance Minister, Ministry of Finance

Ans: 3

28. The monetary unit of Bangladesh is
(1) Rupee
(2) Takka
(3) Rupiah
(4) Dollar

Ans: 2

29. Sellers market denotes a situation where
(1) Commodities are available at competitive rates
(2) Demand exceeds supply
(3) Supply exceeds demand
(4) Supply and demand are equal

Ans: 2

30. Development means economic growth plus
(1) Inflation
(2) Deflation
(3) Price stability
(4) Social change

Ans: 4

31. The Abbreviation NAEP stands for
(1) National Atomic Energy Planning
(2) National Adult education Programme
(3) National Authority on Engineering Projects
(4) Nuclear and Atomic Energy Project

Ans: 2

32. The Abbreviations PSLV stands for
(1) Polar Survey Landing Vehicle
(2) Polarised Source Laser Viewing
(3) Precise Source Locating Vision
(4) Polar Satellite Launch Vehicle

Ans: 4
33. The term ‘epicentre’ is associated with
(1) Earthquakes
(2) Tornadoes
(3) Cyclones
(4) Earth’s interior

Ans: 1

34. Which of the following order is given to the planets of solar system on the basis of their sizes?
(1) Jupiter, Saturn, Earth, Mercury
(2) Saturn, Jupiter, Mercury, Earth
(3) Mercury, Earth, Jupiter, Saturn
(4) Earth, Mercury, Saturn, Jupiter

Ans: 1

35. The solar eclipse occurs when
(1) the sun comes in between the moon and the earth
(2) the earth comes in between the sun and the moon
(3) the moon comes in between the sun and the earth
(4) None of these

Ans: 3

36. The removal of top soil by water or wind is called
(1) Soil wash
(2) Soil erosion
(3) Soil creep
(4) Silting of soil

Ans: 2

37. Which of the following is suitable for growing cotton?
(1) Sandy soil
(2) Clayey soil
(3) Black soil
(4) Alluvial soil

Ans: 3

38. Bandipur Sanctuary is located in the State of
(1) Tamil Nadu
(2) Uttar Pradesh
(3) Karnataka
(4) Madhya Pradesh

Ans: 3
39. Largest State in terms of area, in India is
(1) Assam
(2) Rajasthan
(3) Madhya Pradesh
(4) Jammu and Kashmir

Ans: 2

40. Koraput is related to which of the following Industry
(1) Aeroplane
(2) Ship building
(3) Iron and steel
(4) Electric locomotives

Ans: 1

41. Which of the following group of States is the largest producer of tea?
(1) West Bengal, Tamil Nadu, Himachal Pradesh
(2) Karnataka, Uttar Pradesh, Rajasthan
(3) Assam, Bihar, Jharkhand
(4) West Bengal, Assam, Karnataka

Ans: 4

42. Which of these has the largest river basin?
(1) Brahmaputtra
(2) Ganga
(3) Godavari
(4) Sutlej

Ans: 2

43. The Indus Valley Civilization was famous for
(1) Well-planned cities
(2) Efficient civil organization
(3) Development of Art and Architecture
(4) All of these

Ans: 4

44. The Red Fort of Delhi was built by
(1) Akbar
(2) Shahjehan
(3) Jahangir
(4) Sher Shah

Ans: 2
45. The ancient name of the city of Patna is
(1) Pataliputra
(2) Kanauj
(3) Kausambi
(4) Kapilavastu

Ans: 1

46. The ancient kingdom of “Avanti” had its capital at
(1) Vaishali
(2) Kausambi
(3) Ujjain
(4) Ayodhya

Ans: 3

47. When did Vasco-da-Gama come to India
(1) 1492
(2) 1498
(3) 1398
(4) 1542

Ans: 2

48. The General who gave the firing order at Jallianwala Bag was
(1) Tegart
(2) Cornwallis
(3) Simpson
(4) O. Dwyer

Ans: 4

49. Gandhiji started Satyagraha in 1919 to protest against the
(1) Rowlatt Act
(2) Salt Law
(3) Act of 1909
(4) Jallianwala Bagh Massacre

Ans: 1

50. The Britishers come to India as traders and formed company named
(1) Indo-British Company
(2) The Great Britain Company
(3) Eastern India Company
(4) East India Company

Ans: 4
51. Mahatma Gandhi was born in
(1) Wardha
(2) Porbander
(3) Sabarmati
(4) Ahmedabad

Ans: 2

52. Who gave the slogan “You give me blood, I promise you freedom”?
(1) Bhagat Singh
(2) Chandra Shekhar Azad
(3) Subhash Chandra Bose
(4) Bal Gangadhar Tilak

Ans: 3

53. In which State is Jawahar Tunnel located?
(1) Himachal Pradesh
(2) Uttarakhand
(3) Goa
(4) Jammu and Kashmir

Ans: 4

54. Where did the dance form “Mohini Attam” develop?
(1) Manipur
(2) Kerala
(3) Karnataka
(4) Tamil Nadu

Ans: 2

55. On selling three articles at the cost of four article, there will be profit of
(1) 25%
(2) 100/3 %
(3) 75/2%
(4) 40%

Ans: 2

56. By selling an article for Rs. 40, there is loss of 40%. By selling it for Rs. 80 there is
(1) Gain of 20%
(2) Loss of 10%
(3) Loss of 20%
(4) Gain of 10%

Ans: 1
57. A number consists of two digits whose sum is 8. If 8 is subtracted from the number, the digits interchange their places. The number is
(1) 44
(2) 35
(3) 62
(4) 33
Ans: 4

58. A horse is tied to a peg hammered at one of the corner of a rectangular grass field of 40 m by 24 m by a rope 14 m long. Over how much area of the field can the horse graze?
(1) 154 m²
(2) 308 m²
(3) 240 m²
(4) 480 m²
Ans: 1

59. The sides of a triangle are in the ratio 3 : 5 : 7 and its perimeter is 30 cm. The length of the greatest side of the triangle in cm is
(1) 6
(2) 10
(3) 14
(4) 16
Ans: 3

60. The radius of a right circular cone is 3 cm and its height is 4 cm. The curved surface of the cone will be
(1) 12 sq. cm
(2) 15 sq. cm
(3) 18 sq. cm
(4) 21 sq. cm
Ans: 2

61. The steam engine was invented by
(1) James Watt
(2) James Prescott Joule
(3) New Commen
(4) Isaac Newton
Ans: 1

62. Who invented the telephone?
(1) Thomas Alva Edison
(2) Galileo
(3) Alexander Graham Bell
(4) G. Marconi

Ans: 3

63. Albert Einstein was a famous
(1) Physician
(2) Chemist
(3) Physicist
(4) Biologist

Ans: 3

64. The fractions 7/11, 16/20, 21/22 when arranged in descending order is
(1) 7/11, 16/20, 21/22
(2) 21/22, 7/11, 16/20
(3) 21/22, 16/20, 7/11
(4) 7/11, 21/22, 16/20

Ans: 3

65. If 10% of a number is subtracted from it, the result is 1800. The number is
(1) 1900
(2) 2000
(3) 2100
(4) 2140

Ans: 2

66. The number is just preceding 9909 which is a perfect square is
(1) 9908
(2) 9900
(3) 9899
(4) 9801

Ans: 4

67. In banking ATM stands for
(1) Automated Tallying Machine
(2) Automatic Teller Machine
(3) Automated Totalling Machine
(4) Automated Transaction of Money

Ans: 2

68. Which amongst the following Abbreviations stands for organization related to Indian Defence forces?
(1) DOD
(2) RDSO
(3) DRDO
(4) DRES

Ans: 3

69. Which amongst the following Abbreviations stands for organization related to Indian space programme?
(1) NASA
(2) ISO
(3) ISRO
(4) NSAT

Ans: 3

70. The injection of anti-toxin is given to prevent
(1) Tetanus
(2) Tuberculosis
(3) Typhoid
(4) Filariasis

Ans: 1

71. Dental caries are due to
(1) Viral infection
(2) Contaminated water
(3) Bacterial infection
(4) Hereditary causes

Ans: 3

72. Spinach leaves are rich source of
(1) Vitamin A
(2) Iron
(3) Carotene
(4) Vitamin E

Ans: 2

73. Which of these is not a mosquito borne disease?
(1) Dengue fever
(2) Malaria
(3) Filariasis
(4) Goitre

Ans: 4
74. Oranges are rich source of
(1) Carbohydrates
(2) Fats
(3) Proteins
(4) Vitamins

Ans: 4

75. Which acid is produced when milk gets sour?
(1) Tartaric acid
(2) Butyric acid
(3) Lactic acid
(4) Acetic acid

Ans: 3

76. AIDS stands for
(1) Acquired Immune Disease Syndrome
(2) Acquired Immunity Deficient Syndrome
(3) Acquired Immune Deficiency
(4) Acquired Infection Deficiency Syndrome

Ans: 3

77. Stem cuttings are commonly used for re-growing
(1) Cotton
(2) Banana
(3) Jute
(4) Sugar Cane

Ans: 4

78. Persons with which blood group are called universal donors?
(1) AB
(2) A
(3) O
(4) B

Ans: 3

79. Silk is produced by
(1) Egg of silkworm
(2) Pupa of silkworm
(3) Larva of silkworm
(4) Insect itself

Ans: 3
80. Which amongst the following is the train introduced by Indian Railways bringing travel by AC class within the reach of a common man?
(1) August Kranti
(2) Jan Shatabdi
(3) Garib Rath
(4) Sampark Kranti

Ans: 3

81. Approximately how many stations are there on the Indian Railway Network?
(1) 6000
(2) 7000
(3) 8000
(4) 9000

Ans: 2

82. The Headquarters of North Western Railway is at
(1) Abu Road
(2) Jodhpur
(3) Ajmer
(4) Jaipur

Ans: 4

83. The new electric railway engines are manufactured in
(1) Varanasi
(2) Chittaranjan
(3) Patiala
(4) Chennai

Ans: 3

84. Which of the following is true in regard to Indian railway?
(1) It is the cheapest means of transportation
(2) The chief source of income is transportation of goods
(3) It is the only largest employer
(4) All of the above

Ans: 4

85. The highest gallantry award in India is
(1) Ashok Chakra
(2) Paramvir Chakra
(3) Mahavir Chakra
(4) Param Vishista Chakra

Ans: 2
86. Oscar prize is related to
(1) Literature
(2) Films
(3) Science
(4) Music

Ans: 2

87. Arjuna award is given for
(1) Bravery in the battle field
(2) Excellence in archery
(3) Excellence in sports
(4) Excellent service during emergency

Ans: 3

88. The first Indian recipient of Nobel Prize in Literature is
(1) Mother Teresa
(2) Rabindranath Tagore
(3) Sorjini Naidu
(4) C.V. Raman

Ans: 2

89. Bismillah Khan is related to
(1) Tabla
(2) Sarod
(3) Flute
(4) Shehnai

Ans: 4

90. Who is the external affairs minister in the present union Cabinet?
(1) Shivraj Patil
(2) S.M. Krishna
(3) Priyaranjan Dasmunshi
(4) Pranab Mukherjee

Ans: 2

91. Who is the present Union Agriculture Minister?
(1) Raghuvansh Prasad Singh
(2) Manishankar Iyyer
(3) Sharad Pawar
(4) Kamalnath

Ans: 3
92. Who is the present union Tourism and Culture Minister?
(1) Ambika Soni
(2) Kapil Sibal
(3) Renuka Chaudhary
(4) Sushil Kumar Shinde

Ans: 1

93. Who is the chairman of senior selection committee in BCCI?
(1) Sunil Gavaskar
(2) Dilip Vengasarkar
(3) Krishnamachari Srikkanth
(4) Chetan Chauhan

Ans: 3

94. The assembly elections were held recently in two states namely
(1) Gujarat and Andhra Pradesh
(2) Madhya Pradesh and Himachal Pradesh
(3) Himachal Pradesh and Gujarat
(4) Andhra Pradesh and Himachal Pradesh

Ans: 3

95. Thermometer is related to degree in the same way as clock is related to
(1) Wall
(2) Tower
(3) Hour
(4) Cock

Ans: 3

96. The headquarters of the United Nations Union is located at
(1) Geneva
(2) New York
(3) Rome
(4) Washington

Ans: 2

97. To work on mobile cell phone which of the following is/are required?
(1) Favourable handset
(2) Sim card
(3) Service provider network
(4) All of the above

Ans: 4
98. Find the root value of 36.1 / 102.4
(1) 61 / 34
(2) 19 / 31
(3) 19 / 32
(4) 19 / 33
Ans: 3

99. Which of the following keys of personal computer is not available in the keyboard of traditional typewriters?
(1) Tab
(2) Spacebar
(3) Enter
(4) Backspace
Ans: 3

100. Which of the following words is not related to the functioning of Internet?
(1) www
(2) http
(3) e-mail
(4) MS Word
Ans: 4

101. The largest copper producing country in the World is
1. Chile
2. Russia
3. South Africa
4. China
Ans: 1.

102. If the radius of a circle is diminished by 10%, then its area is diminished by:
1. 10%
2. 19%
3. 20%
4. 36%
Ans: 2.

103. A boat travels 20 kms upstream in 6 hrs and 18 kms downstream in 4 hrs. Find the speed of the boat in still water and the speed of the water current?
1. 1/2 kmph
2. 7/12 kmph
3. 5 kmph
4. none of these

Ans: 2.

104. At what time after 4.00 p.m. is the minutes hand of a clock exactly aligned with the hour hand?

1. 4:21:49.5
2. 4:27:49.5
3. 3:21:49.5
4. 4:21:44.5

Ans: 1.

105. A shopkeeper sold a T.V set for Rs.17,940 with a discount of 8% and earned a profit of 19.6%. What would have been the percentage of profit earned if no discount was offered?

1. 24.8%
2. 25%
3. 26.4%
4. Cannot be determined
5. None of these

Ans: 5.

106. If (2x - y) = 4 then (6x - 3y) =?

1. 15
2. 12
3. 18
4. 10

Ans: 2.

107. A clock is set right at 8 a.m. The clock gains 10 minutes in 24 hours. What will be the true time when the clock indicates 1 p.m. on the following day?

1. 48 min. past 12
2. 38 min. past 12
3. 28 min. past 12
4. 25 min. past 12

Ans: 1.

108. What is the missing number in this series? 8 2 14 6 11 ? 14 6 18 12
1. 16  
2. 9  
3. 15  
4. 6  

Ans: 2.

109. Dinesh travelled 1200 km by air which formed 2/5 of his trip. One third of the whole trip, he travelled by car and the rest of the journey he performed by train. What was the distance travelled by train?

1. 600Km  
2. 700Km  
3. 800Km  
4. 900Km  

Ans: 3.

110. A train which travels at a uniform speed due to some mechanical fault after traveling for an hour goes at 3/5th of the original speed and reaches the destination 2 hrs late. If the fault had occurred after traveling another 50 miles the train would have reached 40 min earlier. What is distance between the two stations.

1. 300  
2. 310  
3. 320  
4. 305  

Ans: 1.

111. The average between a two digit number and the number obtained by interchanging the digits is 9. What is the difference between the two digits of the number?

1. 8  
2. 2  
3. 5  
4. Cannot be determined  

Ans: 4.

112. Pipe A can fill in 20 minutes and Pipe B in 30 mins and Pipe C can empty the same in 40 mins. If all of them work together, find the time taken to fill the tank

1. 17 1/7 mins  
2. 20 mins  
3. 8 mins  
4. none of these
113. A person has 4 coins each of different denomination. What is the number of different sums of money the person can form (using one or more coins at a time)?

1. 16
2. 15
3. 12
4. 11

Ans: 2.

114. The simple interest on a certain sum of money for 3 years is 225 and the compound interest on the same sum at the same rate for 2 years is 153 then the principal invested is

1. 1500
2. 2250
3. 3000
4. 1875

Ans: 4.

115. A cow is tethered in the middle of a field with a 14 feet long rope. If the cow grazes 100 sq. ft. per day, then approximately what time will be taken by the cow to graze the whole field?

1. 2 days
2. 6 days
3. 18 days
4. 24 days
5. None of these

Ans: 2.

116. 2 hours after a freight train leaves Delhi a passenger train leaves the same station travelling in the same direction at an average speed of 16 km/hr. After travelling 4 hrs the passenger train overtakes the freight train. The average speed of the freight train was?

1. 40
2. 30
3. 80
4. 60

Ans: 1.

117. The two colors seen at the extreme ends of the pH chart are:
1. Red and Blue
2. Red and Green
3. Green and Blue
4. Orange and Green

Ans: 1.

118. 8 15 24 35 48 63 _?

1. 70
2. 80
3. 75
4. 88

Ans: 2.

119. One of Mr. Horton, his wife, their son, and Mr. Horton’s mother is a doctor and another is a lawyer.
a) If the doctor is younger than the lawyer, then the doctor and the lawyer are not blood relatives.
b) If the doctor is a woman, then the doctor and the lawyer are blood relatives.
c) If the lawyer is a man, then the doctor is a man. Whose occupation you know?

1. Mr. Horton: he is the doctor
2. Mr. Horton’s son: she is the lawyer
3. Mr. Horton: he is the doctor
4. Mr. Horton’s mother: she is the doctor

Ans: 1.

120. In the given figure, PA and PB are tangents to the circle at A and B respectively and the chord BC is parallel to tangent PA. If AC = 6 cm, and length of the tangent AP is 9 cm, then what is the length of the chord BC?

1. 4 cm
2. 8 cm
3. 6 cm
4. 5 cm

Ans: 1.

121. Union Information and Broadcasting ministry recently gave an indication to change which of the following laws on a larger scale, as the existing provisions of the Act are inadequate to cater to the phenomenal growth of the print media in view of the liberalization of the government policies?

1. Press & Registration of Books Act, (PRB Act) 1867
2. The Delivery Of Books ‘And Newspapers’ (Public Libraries) Act, 1954
3. Indian Press (Emergency Powers ) Act 1931
4. none

Ans: 1.

122. 2 numbers differ by 5. If their product is 336, then the sum of the 2 numbers is:

1. 21
2. 51
3. 28
4. 37

Ans: 4.

123. Which number is the odd one out? 9678 4572 5261 3527 7768

1. 7768
2. 3527
3. 4572
4. 9678
5. 5261

Ans: 2.

124. Which one among the following has the largest shipyard in India

1. Kolkata
2. Kochi
3. Mumbai
4. Visakhapatnam

Ans: 2.

125. If \(x = y = 2z\) and \(xyz = 256\) then what is the value of \(x\)?

1. 8
2. 3
3. 5
4. 6

Ans: 1.

126. A radio when sold at a certain price gives a gain of 20%. What will be the gain percent, if sold for thrice the price?

1. 280
2. 270
3. 290
4. 260

Ans: 4.

127. x% of y is y% of ?

1. x/y
2. 2y
3. x
4. can’t be determined

Ans: 3.

128. If the value of x lies between 0 & 1 which of the following is the largest?

1. x
2. x²
3. -x
4. 1/x

Ans: 4.

129. The tutor of Alexander the great was

1. Darius
2. Cyrus
3. Socrates
4. Aristotle

Ans: 4.

130. Thirty men take 20 days to complete a job working 9 hours a day. How many hour a day should 40 men work to complete the job?

1. 8 hrs
2. 71/2 hrs
3. 7 hrs
4. 9 hrs

Ans: 2.

131. Goitre caused by the deficiency of ……..

1. Vitamin D
2. Iron
3. Vitamin A
4. Iodine
132. Who invented Napier’s Bones

1. John Napier
2. William Oughtred
3. Charles Babbage
4. Napier Bone

Ans: 1.

133. The mass number of a nucleus is

1. Always less than its atomic number
2. Always more than its atomic number
3. Sometimes more than and sometimes equal to its atomic number
4. None of the above

Ans: 3.

134. A and B can do a piece of work in 45 days and 40 days respectively. They began to do the work together but A leaves after some days and then B completed the remaining work in 23 days. The number of days after which A left the work was

1. 9
2. 11
3. 12
4. 15
5. 16

Ans: 1.

135. Sam and Mala have a conversation. Sam says I am certainly not over 40 Mala Says I am 38 and you are at least 5 years older than me · Now Sam says you are at least 39 all the statements by the two are false. How old are they really?

1. Mala = 38 yrs, Sam = 31 yrs.
2. Mala = 38 yrs, Sam = 41 yrs
3. Mala = 31 yrs, Sam = 41 yrs.
4. Mala = 45 yrs, Sam = 41 yrs

Ans: 2.

136. What is the code name for Windows Vista?

1. Longhorn
2. Longhund
3. Stackspray
4. Pearl

Ans: 1.

137. On sports day, if 30 children were made to stand in a column, 16 columns could be formed. If 24 children were made to stand in a column, how many columns could be formed?

1. 20
2. 30
3. 40
4. 50

Ans: 1.

138. The probability that a man will be alive for 25 years is 3/5 and the probability that his wife will be alive for 25 years is 2/3. Find the probability that only the man will be alive for 25 years.

1. 2/5
2. 1/5
3. 3/5
4. 4/5

Ans: 2.

139. In a single throw of a dice, what is the probability of getting a number greater than 4?

1. 1/2
2. 2/3
3. 1/4
4. 1/3

Ans: 4.

140. If every alternative letter starting from B of the English alphabet is written in small letter, rest all are written in capital letters, how the month “September” be written. (1) SeptEMbEr (2) SEpTeMBEr (3) SeptembeR (4) SepteMber (5) None of the above

1. (1)
2. (2)
3. (3)
4. (5)
5. (4)
141. After allowing a discount of 11.11% , a trader still makes a gain of 14.28% . At how many percent above the cost price does he mark his goods?
1. 28.56%  
2. 35%  
3. 22.22%  
4. None of these

Ans: 1.

142. Pipe A can fill in 20 minutes and Pipe B in 30 mins and Pipe C can empty the same in 40 mins. If all of them work together, find the time taken to fill the tank
1. 17 1/7 mins  
2. 20 mins  
3. None  
4. 50 mins

Ans: 1.

143. There are 3 triplet brothers. They look identical. The oldest is John, he always tells the truth. The second is Jack, he always tells a lie. The third is Joe, he either tells the truth or a lie. Jimmie Dean went to visit them one day. He was wondering who was who. So he asked each person a question. He asked the one who was sitting on the left: “Who is the guy sitting in the middle?” The answer was “He is John.” He asked the one who was sitting in the middle: “What is your name?” The answer was “I am Joe.” He asked the one who was sitting on the right: “What is the guy sitting in the middle?” The answer was “He is Jack.” Jimmie Dean got really confused. Basically, he asked 3 same questions, but he got 3 different answers. Which is not true?
1. left most is Joe  
2. middle is Jack  
3. right is John  
4. middle is John

Ans: 4.

144. A / B = C; C > D then
1. A is always greater than D  
2. C is always greater than D  
3. B is always less than D  
4. None

Ans: 1.
145. Consider the following statements: 1. The Administrative Reforms Commission (ARC) had recommended that the Department of Personnel of a State should be put under the charge of the Chief Secretary of the State. 2. Chief Secretary of a State is not involved in any manner in the promotion of State Civil officers to the All-India Services. Which of the statements given above is/are correct?

1. Only 1
2. Only 2
3. Both 1 and 2
4. Neither 1 nor 2

Ans: 1.

146. The population of a town was 1,60,000 three years ago. If it increased by 3%, 2.5% and 5% respectively in the last three years, then the present population of the town is :

1. 1,77,000
2. 1,77,366
3. 1,77,461
4. 1,77,596

Ans: 2.

147. What is the population of India?

1. 98 crores
2. More than 2 billion
3. More than 1 billion
4. Less than 96 crores
5. 96 crores

Ans: 3.

148. Some green are blue. No blue are white.

1. Some green are white
2. No white are green
3. No green are white
4. None of the above

Ans: 1.

149. What is the missing number in this series? 8 2 14 6 11 ? 14 6 18 12

1. 8
2. 6
150. Average age of students of an adult school is 40 years. 120 new students whose average age is 32 years joined the school. As a result the average age is decreased by 4 years. Find the number of students of the school after joining of the new students:

1. 1200
2. 120
3. 360
4. 240

Ans: 4.

151. On sports day, if 30 children were made to stand in a column, 16 columns could be formed. If 24 children were made to stand in a column, how many columns could be formed?

1. 48
2. 20
3. 30
4. 16
5. 40

Ans: 2.

152. Which of the following numbers is divisible by 3? (i) 541326 (ii) 5967013

1. (ii) only
2. (i) only
3. (i) and (ii) both
4. (i) and (ii) none

Ans: 2.

153. A square is divided into 9 identical smaller squares. Six identical balls are to be placed in these smaller squares such that each of the three rows gets at least one ball (one ball in one square only). In how many different ways can this be done?

1. 81
2. 91
3. 41
4. 51

Ans: 1.
154. A man owns 2/3 of the market research bureau business and sells 3/4 of his shares for Rs.75000. What is the value of Business

1. 150000
2. 13000
3. 240000
4. 34000

Ans: 1.

155. 1,2,6,24,...?

1. 111
2. 151
3. 120
4. 125

Ans: 3.

156. The cost of 16 packets of salt, each weighing 900 grams is Rs.28. What will be the cost of 27 packets, if each packet weighs 1Kg?

1. Rs.52.50
2. Rs.56
3. Rs.58.50
4. Rs.64.75

Ans: 1.

157. Ronald and Michelle have two children. The probability that the first child is a girl, is 50%. The probability that the second child is a girl, is also 50%. Ronald and Michelle tell you that they have a daughter. What is the probability that their other child is also a girl?

1. 1/2
2. 1/3
3. 1/4
4. 1/5

Ans: 2.

158. Find the value of \((\frac{21}{4}-1)\left(\frac{23}{4}+\frac{21}{2}+\frac{21}{4}+1\right)\)

1. 1
2. 2
3. 3

Ans: 1.
159. The product of two fractions is \( \frac{14}{15} \) and their quotient is \( \frac{35}{24} \). The greater fraction is

1. \( \frac{4}{5} \)
2. \( \frac{7}{6} \)
3. \( \frac{7}{5} \)
4. \( \frac{7}{4} \)

Ans: 1.

160. 500 men are arranged in an array of 10 rows and 50 columns according to their heights. Tallest among each row of all are asked to fall out. And the shortest among them is A. Similarly after resuming that to their original positions that the shortest among each column are asked to fall out. And the tallest among them is B. Now who is taller among A and B?

1. A
2. B
3. Both are of same height

Ans: 1.

161. Choose the pair of numbers which comes next 75 65 85 55 45 85 35

1. 25 15
2. 25 85
3. 35 25
4. 35 85
5. 25 75

Ans: 2.

162. A three digit number consists of 9,5 and one more number. When these digits are reversed and then subtracted from the original number the answer yielded will be consisting of the same digits arranged yet in a different order. What is the other digit?

1. 1
2. 2
3. 3
4. 4

Ans: 4.

163. ATP stands for:

1. Adenine triphosphate
2. Adenosine triphosphate
3. Adenosine Diphosphate
4. Adenosine tetraphosphate

Ans: 2.

164. Veselin Tapolev who became the World Champion recently, is associated with which of the following games/sports?

1. Chess
2. Golf
3. Snooker
4. Badminton
5. None of these

Ans: 1.

165. A piece of cloth cost Rs 35. if the length of the piece would have been 4m longer and each meter cost Re 1 less, the cost would have remained unchanged. how long is the piece?

1. 10
2. 11
3. 12

Ans: 1.

166. In a journey of 15 miles two third distance was travelled with 40 mph and remaining with 60 mph. How much time the journey takes

1. 40 min
2. 30 min
3. 120 min
4. 20 min

Ans: 4.

167. Solid cube of 6 * 6 * 6. This cube is cut into to 216 small cubes. (1 * 1 * 1).the big cube is painted in all its faces. Then how many of cubes are painted at least 2 sides.

1. 56
2. 45
3. 23
4. 28

Ans: 1.

168. Find the average of first 40 natural numbers.
1. 40
2. 35
3. 30.6
4. 20.5
5. None of these

Ans: 4.

169. 1, 5, 14, 30, ?, 91

1. 45
2. 55
3. 60
4. 70
5. None of these

Ans: 2.

170. There is a shortage of tubelights, bulbs and fans in a village – Gurgaon. It is found that
a) All houses do not have either tubelight or bulb or fan.
b) Exactly 19% of houses do not have just one of these.
c) Atleast 67% of houses do not have tubelights.
d) Atleast 83% of houses do not have bulbs.
e) Atleast 73% of houses do not have fans.

1. 42 %
2. 46 %
3. 50 %
4. 54 %
5. 57 %

Ans: 1.

171. If 9 engines consume 24 metric tonnes of coal, when each is working 8 hours a day; how much coal will be required for 8 engines, each running 13 hours a day, it being given that 3 engines of the former type consume as much as 4 engines of latter type.

1. 22 metric tonnes.
2. 27 metric tonnes.
3. 26 metric tonnes.
4. 25 metric tonnes.

Ans: 3.

172. To 15 lts of water containing 20% alcohol, we add 5 lts of pure water. What is % alcohol.
1. 20%
2. 34%
3. 15%
4. 14%

Ans: 3.

173. In page preview mode:

1. You can see all pages of your document
2. You can only see the page you are currently working
3. Satyam BPO Services
4. You can only see pages that do not contain graphics

Ans: 4.

174. A house wife saved Rs. 2.50 in buying an item on sale. If she spent Rs. 25 for the item, approximately how much percent she saved in the transaction?

1. 8%
2. 9%
3. 10%
4. 11%

Ans: 2.

175. I have trouble _____.

1. to remember my password
2. to remembering my password
3. remember my password
4. remembering my password

Ans: 4.

176. Superheroes Liza and Tamar leave the same camp and run in opposite directions. Liza runs 1 mile per second (mps) and Tamar runs 2 mps. How far apart are they in miles after 1 hour?

1. 10800 mile
2. 19008 mile
3. 12300 mile
4. 14000 mile

Ans: 1.

177. A = 5, B = 0, C = 2, D = 10, E = 2. What is then AB + EE – (ED)powerB + (AC)powerE = ?
1. 113
2. 103
3. 93
4. 111

Ans: 2.

178. A man can row upstream at 8 kmph and downstream at 13 kmph. The speed of the stream is?

1. 2.5 kmph
2. 4.2 kmph
3. 5 kmph
4. 10.5 kmph

Ans: 1.

179. Find what is the next letter. Please try to find. O,T,F,F,S,S,E,N,_ What is that letter?

1. B
2. S
3. Q
4. T
5. O

Ans: 4.

180. There are 3 societies A, B, C. A lent cars to B and C as many as they had already. After some time B gave as many tractors to A and C as many as they have. After sometime C did the same thing. At the end of this transaction each one of them had 24. Find the cars each originally had.

1. A had 21 cars, B had 39 cars & C had 12 cars
2. A had 39 cars, B had 39 cars & C had 12 cars
3. A had 39 cars, B had 21 cars & C had 19 cars
4. A had 39 cars, B had 21 cars & C had 12 cars

Ans: 4.

181. A papaya tree was planted 2 years ago. It increases at the rate of 20% every year. If at present, the height of the tree is 540 cm, what was it when the tree was planted?

1. 432 cm
2. 324 cm
3. 375 cm
4. 400 cm
182. A boy has Rs 2. He wins or loses Re 1 at a time If he wins he gets Re 1 and if he loses the game he loses Re 1. He can loose only 5 times. He is out of the game if he earns Rs 5. Find the number of ways in which this is possible?

1. 14
2. 23
3. 16
4. 12
5. 10

Ans: 3.

183. Five racing drivers, Alan, Bob, Chris, Don, and Eugene, enter into a contest that consists of 6 races. The results of all six races are listed below: Bob always finishes ahead of Chris. Alan finishes either first or last. Eugene finishes either first or last. There are no ties in any race. Every driver finishes each race. In each race, two points are awarded for a fifth place finish, four points for fourth, six points for third, eight points for second, and ten points for first. If Frank enters the third race and finishes behind Chris and Don, which of the following must be true of that race?

1. Eugene finishes first.
2. Alan finishes sixth.
3. Don finishes second.
4. Frank finishes fifth.
5. Chris finishes third.

Ans: 4.

184. A is twice as good a workman as B and together they finish a piece of work in 18 days.In how many days will A alone finish the work?

1. 27
2. 26
3. 25
4. 24

Ans: 1.

185. Daal is now being sold at Rs. 20 a kg. During last month its rate was Rs. 16 per kg. By how much percent should a family reduce its consumption so as to keep the expenditure fixed?

1. 20 %
2. 40 %
3. 3%
4. 2%

Ans: 3.
Ans: 1.

186. The sum of 5 successive odd numbers is 1075. What is the largest of these numbers?

1. 215
2. 223
3. 219
4. 217

Ans: 3.

187. A man sells two buffaloes for Rs. 7,820 each. On one he gains 15% and on the other, he loses 15%. His total gain or loss in the transaction is

1. 2.5% gain
2. 2.25% loss
3. 2% loss
4. 5% loss
5. None of these

Ans: 2.

188. One ship goes along the stream direction 28 km and in opposite direction 13 km in 5 hrs for each direction. What is the velocity of stream?

1. 1.5 kmph
2. 2.5 kmph
3. 1.8 kmph
4. 2 kmph

Ans: 1.

189. Which one of the words given below is different from others?

1. Orange
2. Grape
3. Apricot
4. Raspberry
5. Mango

Ans: 3.

190. Complete the series: 5, 20, 24, 6, 2, 8, ?

1. 12
2. 32
191. A can have a piece of work done in 8 days, B can work three times faster than the A, C can work five times faster than A. How many days will they take to do the work together

1. 3 days
2. 8/9 days
3. 4 days
4. None of the above

Ans: 2.

192. 7 Pink, 5 Black, 11 Yellow balls are there. Minimum no. at least to get one black and yellow ball

1. 17
2. 13
3. 15
4. 19

Ans: 1.

193. \((1/10)^{18} - (1/10)^{20}\) = ?

1. 99/1020
2. 99/10
3. 0.9
4. none of these

Ans: 1.

194. Three friends divided some bullets equally. After all of them shot 4 bullets the total number of bullets remaining is equal to the bullets each had after division. Find the original number divided?

1. 18
2. 20
3. 54
4. 8

Ans: 1.

195. A sum of Rs. 427 is to be divided among A, B and C in such a way that 3 times A’s share, 4 times B’s share and 7 times C’s share are all equal. The share of C is
1. Rs.84
2. Rs.76
3. Rs.98
4. Rs.34

Ans: 1.

196. There are 20 poles with a constant distance between each pole. A car takes 24 second to reach the 12th pole. How much will it take to reach the last pole.

1. 41.45 seconds
2. 40.45 seconds
3. 42.45 seconds
4. 41.00 seconds

Ans: 1.

197. An emergency vehicle travels 10 miles at a speed of 50 miles per hour. How fast must the vehicle travel on the return trip if the round-trip travel time is to be 20 minutes?

1. 72 miles per hour
2. 75 miles per hour
3. 65 miles per hour
4. 78 miles per hour

Ans: 2.

198. 12% of 580 + ? = 94

1. 24.4
2. 34.4
3. 54.4
4. 65.4

Ans: 1.

199. There is a certain relation between two given words on one side of : : and one word is given on another side of : : while another word is to be found from the given alternatives, having the same relation with this word as the given pair has. Select the best alternative. Horse : Jockey : : Car : ?

1. Mechanic
2. Chauffeur
3. Steering
4. Brake

Ans: 2.
200. Which of the following numbers should be added to 11158 to make it exactly divisible by 77?

1. 9
2. 8
3. 7
4. 5

Ans: 3.

201. An ordinary tube light used for lighting purposes contains
(a) fluorescent material and an inert gas
(b) one filament, reflective material and mercury vapour
(c) fluorescent material and mercury vapour
(d) two filaments, fluorescent material and mercury vapour

Ans: d

202. The term ‘Black Box’ is more commonly used in relation to which of the following?
(a) It is a box in which high grade uranium is kept to prevent radiation.
(b) It is a time capsule in which records of important events are kept to be opened at a later date,
(c) It is a flight recorder in an aero plane.
(d) None of these

Ans: c

203. The lightning conductor used in building, protects the building by
(a) dissipating the electric charge away from the building
(b) conducting the lightning safely to the ground
(c) absorbing the electric charge
(d) None of these

Ans: b

204. Sodium vapour lamps are preferred over incandescent lamp because of
(a) higher tolerance to voltage fluctuation
(b) higher intensity of illumination
(c) easy installation
(d) None of these

Ans: b

205. The principle of working of periscope is based on
(a) reflection only
(b) refraction only
(c) reflection and refraction
(d) reflection and interference

Ans: c

206. The working of the quartz crystal in the watch is based on
(a) Johnson effect
(b) Photoelectric effect
(c) Edison effect
(d) Piezoelectric effect

Ans: d

207. A handwritten message can be instantly transmitted as such to any part of the world through
(a) Speed post
(b) Telex
(c) Electronic mail
(d) FAX

Ans: d

208. Which of the following combinations of aperture and shutter speed of a camera will allow the maximum exposure?
(a) F-5.6, 1/1000
(b) F-8, 1/250
(c) F-16, 1/25
(d) F-22, 1/60

Ans: b

209. Hardware is related to?
(a) calculator
(b) computers
(c) acids
(d) heavy metals

Ans: b

210. Which of the following best explains the phenomenon ‘Simple Harmonic Motion’?
(a) Cylinder
(b) Disc
(c) Pendulum
(d) None of these

Ans: c
211. Jet engines are
(a) rotary engines
(b) turbine engines
(c) external combustion engines
(d) reaction engines

Ans: d

212. In an engine run on diesel, ignition is caused through
(a) friction
(b) automatic starter
(c) spark plug
(d) compression

Ans: d

213. In an electronic watch, the component corresponding to the pendulum of a pendulum clock is
(a) Transistor
(b) Balance Wheel
(c) Crystal Oscillator
(d) Diode

Ans: c

214. The hydraulic brakes used in automobiles is a direct application of?
(a) Archimedes’ Principle
(b) Toricellian law
(c) Bernoulli’s theorem
(d) Pascal’s law

Ans: d

215. Which of the following statements is correct?
(a) Dynamo converts electrical energy into heat energy and electric motor converts mechanical energy into electrical energy.
(b) Dynamo converts mechanical energy into electrical energy and electric motor converts electrical energy into mechanical energy.
(c) Both dynamo and electric motor convert electrical energy into mechanical energy.
(d) Both dynamo and electric motor convert mechanical energy into electrical energy.

Ans: b

216. An electron microscope gives higher magnification than an optical microscope because
(a) it uses more powerful lenses.
(b) the velocity of electrons is smaller than that of visible light.
(c) the electrons have more energy than the light particles.
(d) the wavelength of electrons is smaller as compared to the wavelength of visible light.

Ans: d

217. The conversion of electrical energy into chemical energy is observed in ?
(a) fan  
(b) storage battery  
(c) heater  
(d) incandescent bulb  

Ans: b

218. The most efficient engine is ?
(a) Petrol  
(b) Diesel  
(c) Electric  
(d) Steam  

Ans: c

219. The tape of a tape recorder is coated with
(a) Zinc oxide  
(b) Copper sulphate  
(c) Mica  
(d) Ferromagnetic powder  

Ans: d

220. When a coil is rotated in magnetic field, induced current is generated in the coil. This principle is used in making ?
(a) electromagnet  
(b) electric motor  
(c) electric generator  
(d) electric watt meter  

Ans: c

221. Distant objects can be seen with the help of
(a) chronometer  
(b) microscope  
(c) telescope  
(d) spectroscope  

Ans: c

222. The safety fuse should have
(a) high resistance and high melting point  
(b) high resistance and low melting point
(c) low resistance and high melting point
(d) low resistance and low melting point

Ans: b

223. Greenhouse is?
(a) a building chiefly of glass in which the temperature is very low.
(b) a building in which green plants are cultivated.
(c) a building chiefly of glass in which the temperature is maintained within the desired range.
(d) None of these

Ans: c

224. Which of the following is the correct sequence in decreasing order of the wattage of the above?
(a) 2,1,3,4
(b) 3,1,2,4
(c) 3,2,1,4
(d) 4,2,1,3

Ans: b

225. Which of the following is/are true regarding the third (thicker) pin in a 3-pin plug?
1. It ensures better electrical contact.
2. It is connected to the body of the electrical device.
3. It is connected to the earth terminal.
4. It is connected to the neutral terminal.
(a) 1 and 2
(b) 2 and 3
(c) 1 and 3
(d) 4 only

Ans: b

226. Consider the following statements about a thermos flask:
1. It is a practical device in which the heat flowing into or out of the system by conduction, convection or radiation is reduced as much as possible.
2. It consists of a double – walled glass vessel.
3. The heat transfer by convection is minimized by silvering the surfaces and the radiation is minimized by evacuating the space between the walls.
Of these, the correct ones are
(a) 1 and 2
(b) 2 and 3
(c) 1 and 3
(d) 1, 2 and 3
227. Which of the following are true regarding the compact fluorescent tubes now available in market for home use?
1. They use less power (about 20%) compared to filament type bulbs for same amount of light.
2. They operate at higher voltages.
3. They are narrower and shorter than common fluorescent tubes.
(a) 1 and 2
(b) 2 and 3
(c) 1 and 3
(d) 1, 2 and 3

Ans: d

228. In an ordinary dry cell, the electrolyte is
(a) sulphuric acid
(b) manganese dioxide
(c) ammonium chloride
(d) zinc

Ans: c

229. Which of the following pairs of materials serves as electrodes in chargeable batteries commonly used in devices such as torch lights, electric shavers etc.?
(a) Iron and cadmium
(b) Nickel and cadmium
(c) Lead peroxide and lead
(d) Zinc and carbon

Ans: b

230. The mixed oxide fuel is used for which of the following?
(a) Nuclear Reactors
(b) Aero planes
(c) Cryogenic Engines
(d) PSLV rockets

Ans: c

231. Conversion of chemical energy into electrical energy occurs in?
(a) dynamos
(b) electric heaters
(c) battery
(d) atomic bombs

Ans: c
232. In the ordinary fire extinguisher, carbon dioxide is generated by the reaction of?
(a) marble powder and dilute HCL
(b) magnesite and dilute HCL
(c) limestone and dilute Sulphuric Acid
(d) sodium bicarbonate and dilute Sulphuric Acid

Ans: d

233. Which of the following take place when the subject speaks untruth while being tested by the polygraph instrument?
1. His blood pressure goes up.
2. His pulse quickens.
3. His skin darkens.
4. He sneezes.
(a) 1 and 2
(b) 3 and 4
(c) 1, 2 and 3
(d) 2, 3 and 4

Ans: a

234. What is the function of a microprocessor in a computer?
(a) It allows the keyboard to write on the computer.
(b) It allows the outputs to be taken from a computer.
(c) It performs all the functions of a CPU (Central Processing Unit).
(d) None of these

Ans: c

235. Teletext means?
(a) the process of convening black & white TV sets into coloured ones.
(b) flashing of telephone conversation on TV screen.
(c) flashing the text of the message on the telex machine.
(d) flashing of the text of news and information on the TV screen.

Ans: d

236. Which of the following statements about a refrigerator is/are correct?
1. It converts electrical energy into heat energy.
2. It converts electrical energy into mechanical energy.
3. It transfers heat from a high temperature to a low temperature.
4. It transfers heat from a low temperature to a high temperature.
(a) 1 and 3
(b) 2 and 3
(c) 1 and 4
(d) 4 only
237. Which of the following statements are true regarding transmission of television programmes?
1. Picture is transmitted with velocity of light.
2. Sound is transmitted with velocity of sound.
3. Sound is transmitted with velocity of light.
4. Different colours of the picture are transmitted with different velocities.
(a) 1 and 3
(b) 1, 2 and 3
(c) 2, 3 and 4
(d) 1, 3 and 4

Ans: a

238. The anode in a dry cell consists of
(a) graphite
(b) zinc
(c) copper
(d) cadmium

Ans: a

239. The technique used to transmit audio signals in television broadcasts is
(a) Amplitude Modulation
(b) Frequency Modulation
(c) Pulse Code Modulation
(d) Time Division Multiplexing

Ans: c

240. Floppy disc in a computer system is
(a) compiler
(b) core memory
(c) software
(d) device for storing and retrieving data

Ans: d

241. The best colour(s) for a sun umbrella will be
(a) black
(b) black on top and white on the inside
(c) white on top and black on the inside
(d) printed with all the seven colours of rainbow

Ans: c

242. Which one of the following can be used to confirm whether drinking water
contains a gamma emitting isotope or not?
(a) Spectrophotometer
(b) Microscope
(c) Scintillation counter
(d) Lead plate

Ans:c

243. The following processes take place during the launching of a rocket:
1. Rocket fuel is burnt.
2. Gases are produced.
3. Rocket moves in the forward direction.
4. Gases come out with momentum in backward direction.
The correct sequential order in which the above processes occur, is
(a) 1,2,3,4
(b) 1,3,2,4
(c) 1,2,4,3
(d) 1,3,4,2

Ans:c

244. A computer can be freely programmable
(a) if it is of a digital type
(b) if it is controlled synchronously
(c) if it contains a read only memory (ROM)
(d) if it contains a random access memory (RAM)

Ans:c

245. Which of the following polymers is widely used for making bullet proof material?
(a) Polyethylene
(b) Polyamides
(c) Polyvinyl chloride
(d) Polycarbonates

Ans:a

246. What is a flow chart in computer terminology?
(a) A graphical representation of a sequence of operations in a computer program
(b) A circular chart used for computer languages
(c) A debugging programme.
(d) None of these

Ans:a

247. A transistor is most likely to be found in a
(a) wrist watch
(b) fuse
(c) hearing aid
(d) fluorescent lamp

Ans: c

248. Ball bearings are used to reduce friction by
(a) applying lubricants to the balls used
(b) reducing the area of contact with the use of metallic balls
(c) increasing the area of contact with the use of metallic balls
(d) None of these

Ans: b

249. Aviation fuel for jet aeroplanes consists of purified
(a) petrol
(b) kerosene
(c) gasoline
(d) diesel

Ans: a

250. Recoil of a gun is an example of
(a) conservation of mass
(b) conservation of energy
(c) conversion of Potential Energy into Kinetic Energy
(d) conservation of linear momentum

Ans: d