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1.Probability

1) For the FIFA world cup, Paul the octopus has been predicting the winner of each match with amazing success. It is rumored that in a match between 2 teams A and B, Paul picks A with the

same probability as A's chances of winning. Let's assume such rumors to be true and that in a match between Ghana and Bolivia; Ghana the stronger team has a probability of $\frac{2}{3}$ of winning the game. What is the probability that Paul will correctly pick the winner of the Ghana-Bolivia game?

a) $\frac{1}{9}$

b) $\frac{4}{9}$

c) $\frac{5}{9}$

d) $\frac{2}{3}$

The probability that Paul correctly picks the winner
 $= (\text{A's Chances of winning}) \times (\text{Paul's picking the winner correctly}) + (\text{A's chances of losing}) \times (\text{Paul picks wrongly}) = \frac{2}{3} \times \frac{2}{3} + \frac{1}{3} \times \frac{1}{3} = \frac{5}{9}$

2) There are two boxes, one containing 10 red balls and the other containing 10 green balls. You are allowed to move the balls between the boxes so that when you choose a box at random and a ball at random from the chosen box, the probability of getting a red ball is maximized. This maximum probability is

If rearrangement is not allowed, then actual probability of picking up a red ball

$$= \frac{1}{2} \left(\frac{10}{20} \right) + \frac{1}{2} \left(\frac{0}{20} \right) = \frac{1}{4}$$

As we are allowed to move the balls, we keep only 1 red in the first box, and shift the remaining 9 to the second.

$$\text{So } = \frac{1}{2} \times \left(\frac{1}{10} \right) + \frac{1}{2} \times \left(\frac{9}{19} \right) = \frac{14}{38}$$

3) University of Vikramsila has enrolled nine PhD candidates. Babu, Chitra, Dheeraj , Eesha, Farooq,Gowri , Hameed, Iqbal, Jacob.

-Farooq and Iqbal were enrolled on the same day as each other, and no one else was enrolled that day.

-Chitra and gowri were enrolled on the same day as each other, and no one else was enrolled that day.

-On each of the other days of hiring , exactly one candidate was enrolled.

-Eesha was enrolled before Babu.

-Hameed was enrolled before Dheeraj

-Dheeraj was enrolled after Iqbal but before Eesha

-Gowri was enrolled after both Jacob and Babu

-Babu was enrolled before Jacob

Who were the last two candidates to be enrolled?

a. Babu and Gowri

b. Eesha and Jacob

c. Babu and Chitra

d. Gowri and Chitra

Answer: d

4) A card from a pack of 52 cards is lost. From the remaining cards of the pack, two cards are drawn and are found to be both spade. Find the probability of the lost card being a spade.

a. $10/50$

b. $10/53$

c. $11/50$

d. $11/53$

Answer:C

5) There are two bags containing white and black balls. In the first bag there are 8 white and 6 black balls and in the second bag, there are 4 white and 7 black balls. One ball is drawn at random from any of these two bags. Find the probability of this ball being black.

a. $21/154$

b. $7/54$

c. $21/77$

d. $41/77$

Answer:D

6) A bag contains 1100 tickets numbered 1, 2, 3, ... 1100. If a ticket is drawn out of it at random, what

is the probability that the ticket drawn has the digit 2 appearing on it

- a. $291/1100$
- b. $292/1100$
- c. $290/1100$
- d. $301/1100$

Answer: c

7) Oranges can be packed in sets of 10 oranges in box type A or 25 oranges in box type B. A carton comprising of 1000 oranges of type a and b is packed. How many different combinations are possible in the number of type A and type B boxes while organizing the oranges?

- a. 21
- b. 20
- c. 19
- d. 18

Answer: a

8) In this question, A^B refers to A raised to the power B. Ten tickets numbered 1, 2, 3, ..., 10. Six tickets are selected at random one of a time with

replacement. The probability of the largest number appearing on the selected ticket is 7 is

- a. $(7^6 + 1)/10^6$
- b. $(7^6 - 6^6)/10^6$
- c. $(7^6 + 6^6)/10^6$
- d. $6^6/10^6$

Answer:

9) In this question AB means A raised to the power B.
If $f(x) = ax^4 - bx^2 + x + 5$.

$f(-3) = 2$. Then $f(3) = ?$

- (a) 3 (b) -2 (c) 8 (d) 1

10) Four people each roll a fair dice once. Find the probability that at least two people will roll the same number?

- a. None
- b. $5/18$
- c. $13/18$
- d. $1295/1296$

Answer:c

11). Curious Elva asked her father what he would gift for her nineteenth birthday. Father replied that it would depend on the day of the week and be one of SUNglasses, MONeybag, ..., FRIdcake, and SATchel. Please help Elva find the day of the week on 08-Jan-2029

- a. Monday
- b. Tuesday
- c. Thursday
- d. Saturday

Answer: a

12). Three containers A, B and C are having mixtures of milk and water in the ratio of 1:5, 3:5, 5:7 respectively. If the capacities of the containers are in the ratio 5:4:5, find the ratio of milk to water, if all the three containers are mixed together.

- a. 53:115
- b. 53:113
- c. 54:115
- d. 54:113

Answer: a

13). There are 120 male and 100 female in a society. Out of 25% male and 20% female are rural. 20% male

and 25% of female rural people passed in the exam. What % of rural students have passed the exam?

Answer: 22%

14). What is the probability of getting sum 3 or 4 when 2 dice are rolled

Answer: $5/36$

15). In a group of five families, every family is expected to have a certain number of children, such that the number of children forms an arithmetic progression with a common difference of one, starting with two children in the first family. Despite the objection of their parents, every child in a family has as many pets to look after as the number of offsprings in the family. What is the total number of pets in the entire group of five families.

a. 99

b. 9

c. 55

d. 90

Answer: d

16). The average marks of 3 students A, B and C is 60. When another student D joins the group, the new average becomes 56 marks. If another student E, who has 3 marks more than D, joins the group, the average of the 4 students B, C, D and E becomes 55 marks. How many marks did A get in the exam?

a. 50

b. 54

c. 51

d. 53

Answer: c

17). In a class, the number of boys is equal to the number of girls. What was the total number of students if twice the number of boys as girls remain when 12 girls entered out?

Answer: 48

Solution:

Let 'b' be the number of boys and 'g' be the number of girls. According to the question:

$$\Rightarrow b / (g - 12) = 2 / 1$$

Since $b = g$;

we get $g = 24$.

So the total number of students = $24 + 24 = 48$

18). If n is the sum of two consecutive odd integers and less than 100, what is the greatest possibility of n ?

A. 98

B. 94

C. 96

D. 99

Answer : C

19). $x^2 < 1/100$, and $x < 0$ what is the highest range in which x can lie?

A. $-1/10 < x < 0$

B. $-1 < x < 0$

C. $-1/10 < x < 1/10$

D. $-1/10 < x$

Answer: A

20). There are 4 boxes colored red, yellow, green and blue. If 2 boxes are selected, how many combinations are there for at least one green box or one red box to be selected?

A. 1

B. 6

C. 9

D. 5

Answer: 5

21). A drawer holds 4 red hats and 4 blue hats.

What is the probability of getting exactly three red hats or exactly three blue hats when taking out 4 hats randomly out of the drawer and immediately returning every hat to the drawer before taking out the next?

A. $1/2$

B. $1/8$

C. $1/4$

D. $\frac{3}{8}$

Answer: B

22) In how many ways can we distribute 10 identical looking pencils to 4 students so that each student gets at least one pencil?

A. 5040

B. 210

C. 84

D. None of these

Answer: C

23). Of the 38 people in my office, 10 like to drink chocolate, 15 are cricket fans, and 20 neither like chocolate nor like cricket. How many people like both cricket and chocolate?

a. 7

b. 10

c. 15

d. 18

Sol: Option A

24). Eric throws two dice, and his score is the sum of the values shown. Sandra throws one die, and her

score is the square of the value shown. What is the probability that Sandra's score will be strictly higher than Eric's score?

- a. $137/216$
- b. $17/36$
- c. $173/216$
- d. $5/6$

Sol: A

25).Anand packs 304 marbles into packets of 9 or 11 so that no marble is left. Anand wants to maximize the number of bags with 9 marbles. How many bags does he need if there should be atleast one bag with 11 marbles

- a. 33
- b. 32
- c. 31
- d. 30

Answer: B

26).When Usha was thrice as old as Nisha, her sister Asha was 25, When Nisha was half as old as Asha, then sister Usha was 34. their ages add to 100. How old is Usha?

- a. 37
- b. 44
- c. 45
- d. 40

Answer: D

27). In how many ways can the letters of the english alphabet be arranged so that there are seven letter between the letters A and B, and no letter is repeated

- a. $24P7 * 2 * 18!$ b. $36 * 24!$
- c. $24P7 * 2 * 20!$ d. $18 * 24!$

Answer: B.

28). Find the probability that a leap year chosen at random will have 53 Sundays.

- a. $1/7$ b. $2/7$
- c. $1/49$ d. $3/7$

Answer: B

29). Eric throws two dice, and his score is the sum of the values shown. Sandra throws one die, and her score is the square of the value shown. What is the probability that Sandra's score will be strictly higher than Eric's score?

- a. $137/216$
- b. $17/36$
- c. $173/216$
- d. $5/6$

Sol: A

30).Of the 38 people in my office, 10 like to drink chocolate, 15 are cricket fans, and 20 neither like chocolate nor like cricket. How many people like both cricket and chocolate?

- a. 7
- b. 10
- c. 15
- d. 18

Sol: Option A

31).A permutation is often represented by the cycles it has. For example, if we permute the numbers in the natural order to 2 3 1 5 4, this is represented as $(1\ 3\ 2)(5\ 4)$. In this the (132) says that the first number has gone to the position 3, the third number has gone to the position 2, and the second number has gone to position 1, and $(5\ 4)$ means that the fifth number has gone to position 4 and the fourth number has gone to position 5. The numbers with

brackets are to be read cyclically. If a number has not changed position, it is kept as a single cycle. Thus 5 2 1 3 4 is represented as $(1345)(2)$. We may apply permutations on itself. If we apply the permutation $(132)(54)$ once, we get 2 3 1 5 4. If we apply it again, we get 3 1 2 4 5, or $(123)(4)(5)$. If we consider the permutation of 7 numbers $(1457)(263)$, what is its order (how many

times must it be applied before the numbers appear in their original order)?

- a. 12
- b. 7
- c. $7!$ (factorial of 7)
- d. 14

Sol: Not yet solved

32) ..A white cube (with six faces) is painted red on two different faces. How many different ways can this be done (two paintings are considered same if on a suitable rotation of the cube one painting can be carried to the other)?

- a. 2
- b. 15
- c. 4

d. 30

Sol: Option A

33). There are 20 balls which are red, blue or green. If 7 balls are green and the sum of red balls and green balls is less than 13, at most how many red balls are there?

A. 4

B. 5

C. 6

D. 7

Answer: B

34). If n is the sum of two consecutive odd integers and less than 100, what is the greatest possibility of n ?

A. 98

B. 94

C. 96

D. 99

Answer : C

35). There are 4 boxes colored red, yellow, green and blue. If 2 boxes are selected, how many

combinations are there for at least one green box or one red box to be selected?

A. 1

B. 6

C. 9

D. 5

Answer: 5

36). All faces of a cube with an eight - meter edge are painted red. If the cube is cut into smaller cubes with a two - meter edge, how many of the two meter cubes have paint on exactly one face?

A. 24

B. 36

C. 60

D. 48

Answer : A

37). There is a chocolate factory which distributes chocolates to a class. It supplies chocolates to a

class of 50 students for 30 days, keeping in mind that all students get an equal number of chocolates. For the first 10 days, only 20 students were present. How many students be accommodated into the group so that all the chocolates get consumed?

a) 70

b) 55

c) 60

d) 45

Answer: d) 45

Solution:

*Let each student get 1 chocolate each, so the total number of chocolates = $50 * 30 = 1500$ chocolates.*

*For first 10 days 20 students were present, so total chocolates consumed = $20 * 10 = 200$ chocolates.*

Chocolates left = 1300. These are to be distributed for the next 20 days. Therefore in each day $1300 / 20$ chocolates were to be consumed which = 65 chocolates per day.

So the required answer = $65 - 20 = 45$ chocolates.

38). There are a set of 20 students out of which 18 are boys and 2 are girls. They are to be seated in a circular manner so that the two girls are always separated by a boy. In how many ways can the students be arranged?

- a) 12
- b) $18! \times 2$
- c) $17 \times 2!$
- d) 17!

Answer: b) $18! \times 2$

Solution:

*There are in all 20 places out of which if one girl sits in one position then the other girl may sit either to her left or right skipping one place, which is to be filled by a boy. So total number of ways the boys can sit = $18!$ ways and girls may alternate there sits so the total answer would be = $18! * 2$ ways.*

39) Ram appears for an exam. In paper A he scores 18 out of 70. In paper B he scores 14 out of 30. So in which paper did he perform better?

a) Paper A

b) Paper B

Answer: b) Paper B

Solution:

We just need to calculate the percentage he scored in each paper.

*In paper A: $(18/70) * 100 = 25.7\%$*

*In paper B: $(14/30) * 100 = 46.6\%$ (Answer)*

40) Ram and Shyam salaries are in the ratio of 2:3. If both of their salaries are increased by Rs 4000 each, the new ratio becomes 40:57. What is Shyam's present salary?

- a) Rs. 17, 000
- b) Rs. 20, 000
- c) Rs. 25, 500
- d) None of these

Answer: d) None of these

Solution:

Let Ram's and Shyam's salary be 'x'. The ratio of their salary according to the question is 2x:3y

According to the question,

$$(2x+4000):(3x+4000) = 40:57$$

On solving we get $3x = 34000$

Therefore, the present salary of Shyam is Rs. 38000

41). Four people each roll a four die once. Find the probability that at least two people will roll the same number ?

- a. $5/18$
- b. $13/18$
- c. None of the given choices
- d. $1295/1296$

Sol: B

Explanation: The number of ways of rolling a dice where no two numbers probability that no one rolls the same number = $6 \times 5 \times 4 \times 3$ Now total possibilities of rolling a dice = 6464 The probability that a no one gets the same number = $6 \times 5 \times 4 \times 3 / 6464 = 518 / 6464$ So the probability that at least two people gets same number = $1 - 518 / 6464 = 1318 / 6464$

42).A bag contains 1100 tickets numbered 1, 2, 3, ... 1100. If a ticket is drawn out of it at random, what is the probability that the ticket drawn has the digit

2 appearing on it?

- a. $291/1100$
- b. $292/1100$
- c. $290/1100$
- d. $301/1100$

Answer: c

43). Four people each roll a four die once. Find the probability that at least two people will roll the same number ?

- a. $5/18$
- b. $13/18$
- c. None of the given choices
- d. $1295/1296$

Answer: b

44) There are two bags, one of which contains 5 red and 7 white balls and the other 3 red and 12 white balls. A ball is to be drawn from one or other of the two bags ; find the chances of drawing a red ball.

- a. $55/102$
- b. $17/21$
- c. $37/120$
- d. $7/8$

Answer: c

45). 3 dice are rolled. What is the probability that you will get the sum of the no's as 10?

- a. $27/216$
- b. $25/216$
- c. $10/216$

d. $1/8$

Answer: d

46) *There are two decks of cards each deck containing 20 cards, with numbers from 1 to 20 written on them. A card is drawn at random from each deck, getting the numbers x and y . What is the probability that $\log x + \log y$ is a positive integer.*

(Logs are taken to the base 10.)

a) $7/400$

b) $29/100$

c) $3/200$

d) $1/80$

Answer: a) $7/400$

Solution:

We know that $\log x + \log y = \log xy$

for $\log xy$ to be positive, we have the following choices:

(1, 10), (10, 1), (10, 10), (5, 20), (20, 5), (2, 5), (5, 2)

So the probability = $7/400$

47) In a football match, 16 teams participate and are divided into 4 groups. Every team from each group will play with each other once. The top 2 winning teams will move to the next round and so on the top two teams will play the final match. So how many minimum matches will be played in that tournament?

a) 40

b) 14

c) 43

d) 50

Answer: c) 43

Solution:

Total matches to be played = $4C2 = 6$ matches.

So total number of matches played in the first round =

*$6 * 4 = 24$ matches*

Now top two teams from each group progress to the next round. These 8 teams are to be divided into 2 groups.

Total matches played in the second round = $6 \times 2 = 12$ matches

*Now 4 teams progress to the next round. Total matches played in the third round = $6 * 1 = 6$ matches*

From this round, 2 teams progress to the next round. And final will be played between them.

Total matches = $24 + 12 + 6 + 1 = 43$

48) There is an office consisting of 38 people. 10 of them like to play golf, 15 like to play football and 20 neither play golf nor football. How many like both golf and football?

- a) 10
- b) 7
- c) 15

d) 18

Answer: b) 7

Solution:

Let the number of people liking golf = 'A'

Let the number of people liking football = 'B'

Let the number of people liking either golf or football =

$$A \cup B = 38 - 20 = 18$$

People liking both golf and football = $A + B - A \cup B$ =

$$10 + 15 - 18 = 7$$

49) If a dice is rolled 2 times, what is the probability of getting a number 3 or 4?

a) 6/36

b) 5/36

c) 1/9

d) $1/12$

Answer: b) $5/36$

Solution:

Total probability = 36

We can get a sum of 3 or 4 in this many ways:

$\Rightarrow (2, 1), (1, 2), (1, 3), (3, 1), (2, 2) = 5$

So probability = $5 / 36$

50) Four people each roll a four die once. Find the probability that at least two people will roll the same number?

a. $13/18$

b. $5/18$

c. None of the above

d. $1295/1296$

Answer: a) $13/18$ ways

Solution:

Total possible outcomes = = 1296

Number of ways in which no two people get same

number = $6 \times 5 \times 4 \times 3 = 360$ ways

The probability of no two people getting the same

number = $360 / 1296$ ways = $5/18$ ways

So the probability of at least two people getting the

same number = $1 - 5/18 = 13/18$ ways

51) There is a toy gun that made 10 musical sounds. It makes 2 musical sounds after being defective. What is the probability that same musical sound would be produced 5 times consecutively?

a) $1/16$

b) $1/32$

c) $1/48$

d) $1/2$

Answer: b) $1/32$

Solution:

The probability of making the same sound every time

= $1/2$,

So, $1/2^5 = 1/32$ (answer)

7 n the sequence of

52)problemsolvingproblemsolvingproblemsolving...

what is the 2015th alphabet?

a) p

b) g

c) r

d) n

Answer: d) n

Solution:

'problemsolving' consist of 14 letters. On dividing 2015 by 14 we get 13. So the 13th letter is n and hence the answer.

$$\text{or } R's \text{ share} = 5/(8+7+5) * 3000 = 750$$

53) In a basement, there are some bicycles and cars.
On Tuesday there are 182 wheels in the basement.
How many bicycles are there?

- a) 20
- b) 19
- c) 18
- d) 16

Answer: b) 19

54). In a staircase, there are 10 steps. A child is attempting to climb the staircase. Each time she can either make 1 step or 2 steps. In how many different ways can she climb the staircase? a) 10 b) 21 c) 36 d) None of these

Ans: d Use fibonacci series, with starting two terms as 1, 2. So next terms are 3, 5, 8, 13, 21, 34, 55, 89

55). A boy buys 18 sharpeners, (Brown/white) for Rs.100. For every white sharpener, he pays one rupee more than the brown sharpener. What is the cost of white sharpener and how much did he buy? a) 5, 13 b) 5, 10 c) 6, 10 d) None of these

Ans: C Assume that he bought b , brown sharpeners and w , white sharpeners and the cost of brown sharpener is x and white sharpener is $x + 1$ So $w(x+1) + bx = 100$ $w + b = 18$ $b = 18 - w$ Substituting in equation 1, we get $w(x+1) + (18 - w)x = 100$ so $w + 18x = 100$ Take option 1: If white sharpeners are 13, $x = (100 - 13) / 18 = 4.833$ Option 2, If white sharpeners are 10, $x = (100 - 10) / 18 = 5$ So white sharpeners cost is 6. Option 3 Satisfies this condition.

56) On a toss of two dice, A throws a total of 5. Then the probability that he will throw another 5 before he throws 7 is?

a)40 b)45 c)50 d)60

ans)a.

57) dice are rolled. What is the probability that you will get

the sum of the no's as 10?

a) $27/216$ b) $25/216$ c) $10/216$ d) $1/11$

ans)a.

58)Thangam and Pandiyamma go for an interview for two vacancies.

The probability for the selection of Thangam is $1/3$ and whereas

the probability for the selection of Pandiyamma is $1/5$.

What is the probability that none of them are selected?

a) $3/5$ b) $7/12$ c) $8/15$ d) $1/5$

ans)c.

59)Find no of ways in which 4 particular persons a,b,c,d and

6 more persons can stand in a queue so that A always stand

before B. B always stand before C, And C always stand before D.

a) $6!$ b) $7!$ c) $1006 \cdot 6!$ d) $10046!$

Ans) b.

60) find the number of ways a batsman can score a double century

only in terms of 4's & 6's?

a) 15 b) 16 c) 17 d) 18

ans) b.

61) There are 20 persons sitting in a circle. In that, there are

18 men and 2 sisters. How many arrangements are possible,

in which the two sisters are always separated by a man?

a) $18! \cdot 2$ b) $17!$ c) $17! \cdot 2$ d) 12

ans) a.

62) The letters in the word "PLACES" are permuted in all possible ways

and arranged in the alphabetical order. Find the word at 48 position.

a)AESPCCL b)ALCEPS c)ALSCEP d)AESPLC

ans)d.

63)In how many ways a team of 11 must be selected
a team 5 men

and 11 women such that the team must comprise of
not more

than 3 men.

a)1565 b)2256 c)2456 d)1243

ans)b.

64)2/3rd of the balls in a bag are blue, the rest are
pink.

if 5/9th of the blue balls and 7/8th of the pink balls
are

defective, find the total number of balls in the bag
given

that the number of non defective balls is 146.

A 432

B 216

C 576

D 649

ans)a.

65) 100 students appeared for two different examinations 60 passed

the first, 50 the second and 30 both the examinations. Find the

probability that a student selected at random failed in both

the examination?

A $5/6$

B $1/5$

C $1/7$

D $5/7$

ans) b.

66) From a bag containing 8 green and 5 red balls, three are drawn

one after the other. the probability of all three balls being

green if the balls drawn are replaced before the next ball pick

and the balls drawn are not replaced, are respectively?

A $512/2197, 336/2197$

B $512/2197, 336/1716$

☐ C $336/2197$, $512/2197$

☒ D $336/1716$, $512/1716$

ans)a.

67)A bag contains 8 white balls and 3 blue balls.
Another bag

contains 7 white and 4 blue balls. What is the
probability

of getting blue ball?

☐ A $3/7$

☐ B $7/22$

☐ C $7/25$

☒ D $7/15$

ans)b

68)There are two bags, one of which contains 5 red
and 7 white balls and the other 3 red and 12 white
balls. A ball is to be drawn

from one or other of the two bags ; find the chances
of drawing

a red ball.

☐ A $55/102$

☐ B $17/21$

☐ C $37/120$

D $7/8$

. ans)c.

69) There are 5 letters and 5 addressed envelopes. If the letters

are put at random in the envelopes, the probability that all

the letters may be placed in wrongly addressed envelopes is

A $1/9$

B $4/4$

C $5/9$

D $4/0$

ans)b

70) A bag contains 1100 tickets numbered 1, 2, 3, ..., 1100.

If a ticket is drawn out of it at random, what is the probability

that the ticket drawn has the digit 2 appearing on it?

A $291/1100$

B $292/1100$

C $290/1100$

D $301/1100$

ans)c.

71) In how many ways can we distribute 10 pencils to 4 children so each child gets atleast one pencil?

Number of ways of distributing r identical objects to n distinct objects

so that each get atleast one = $(n-1)C(r-1)$
 $= (10-1)C(4-1) = 9C3$

72) There are 4 different letters and 4 addressed envelopes. In how many ways can the letters be put in the envelopes so that atleast one letter goes to the correct address ?

a)15 b)16 c)18 d)12

Total ways of putting r letters to r covers = $r! = 4! = 24$
Number of ways that none of them goes into the right envelope =

$$D_4 = 4!(12! - 13! + 14!) = 9$$

So atleast one envelope goes into the right one = $24 - 9 = 15$

73) There are 26 questions in a test. A student who takes up this test gets 8 marks for a right answer and -5 marks for an incorrect answer, finally he scored 0 marks. How many answers marked are correct?

- a. 9 b. 11 c. 10 d. 12

74) In this question A^B means A raised to the power of B. Start with the integers from 1 to 10^{2012} . Replace each of them by the sum of its digits to get a string of 10^{2012} numbers. Keep doing this until you get 10^{2012} single digit numbers. Let m be the number of 1's and n be the number of 2's. Then

$$m - n$$

75) In the town of Uneven Ville, it is a tradition to have the size of the front wheels of every cart

different from that of the rear wheels. They also have special units to measure cart wheels which is called uneve. The circumference of the front wheel of a cart is 133 uneves and that of the back wheel is 190 uneves. What is the distance travelled by the cart in uneves, when the front wheel has done nine more revolutions than the rear wheel?

a. 570 b. 1330 c. 3990 d. 399

76) Oranges can be packed in sets of 10 oranges in box type A or 25 oranges in box type B. A carton comprising of 1000 oranges of type a and b is packed. How many different combinations are possible in the number of type A and type B boxes while organizing the oranges

A 18 B 19 C 20 D 21

77) In how many ways can we reach destination from source?

78) Which area is larger a or b?

a. a b. b c. a & b are equal d. cannot be determined

79) A number divided by 50 leaves a remainder 16. The same number when divided by 80 leaves a remainder n. Find no of possible values for n?

a. 8 b. 9 c. 10 d. 11

80) Tickets are numbered from 1, 2....1100 and one card is drawn randomly what is the probability of having 2 as a digit?

a) $\frac{290}{1100}$ b) $\frac{291}{1100}$ c) $\frac{292}{1100}$ d) $\frac{390}{1100}$

81)) The rupee or coin changing machine at a bank has a flaw. it gives 10 ten rupee notes if you put a 100 rupee note and 10 one rupee coins if you insert a 10 rupee note but gives 10 hundred rupee notes when you put a 1 rupee coin. Shivaji, after being ruined by his rivals in business is left with a one rupee coin and discovers the flaw in the machine by accident. By using the machine repeatedly, which of the following amounts is valid amount that Shivaji can have when he gets tired and stops at some stage

(assume that the machine has an infinite supply of notes and coins)

A 26975

B 53947

C 18980

D 33

82))Which is greater a. 1 b. 2

c. Cannot be determined

d. none of the above

83)When n is divided by 50 Remainder is 16, when same number is divided by 80,

how many remainders are possible.

84) Apples cost Rs.L per kilogram for the first 30 kilograms and Rs.Q per kilogram

for each additional kilogram. If the price paid for 33 kilograms of apples is Rs.11.67

and for 36 kilograms of apples is Rs.12.48, then the cost of first 10

kgs of apples.

(a) Rs.117 (b) Rs.1053 (c) Rs.350 (d) Rs.281

85) Apples cost L rupees per kilogram for the first 30 kilograms and Q per kilogram

for each additional kilogram. If the price paid for 33 kilograms of Apples is Rs.1167

and for 36 kilograms of apples is Rs.1284, then the cost of the first 10 kgs of apples

is (a) Rs.117 (b) Rs.350 (c) Rs.281 (d) Rs.1053

86) According to the stock policy of a company each employee in the technical

division is given 15 shares of the company and each employee in the

recruitment division is given 10 shares employee belonging to both communities

get 25 shares each there are 20 employees in the company and each one belong

to at least one division the cost of each share is 10\$ if the technical division 15

employees and the recruitment division has 10 employees then what is the

total cost of the shares given by the company?

A. 3120

B. 2650

C. 3250

D. 3180

87) Tickets are numbered from 1, 2, ..., 1100 and one card is drawn randomly what

is the probability of having 2 as a digit?

A. $290/1100$

B. $291/1100$

C. $292/1100$

D. $390/1100$

88) George, Paul and Hari start a business by contributing Rs. 30000, Rs. 40000 &

Rs. 50000 respectively after $1/2$ a year George withdraws half his contribution at

the end of the year the business showed a profit of Rs. 90000 which divided

amongst the 3 men proportionate to amount and duration of their investment in

the enterprise. Paul got

- A. 25000
- B. 18000
- C. 32000
- D. 24000

89) On a 26 question test, 5 points were deducted for each wrong answer and 8

points were added for right answer if all the questions were answered how many

were correct if the score was zero

- A. 10
- B. 11
- C. 12
- D. 13

90) From the deck of 52 cards, four cards are selected and one card of it should be

spade, another should be heart. In how many ways can the cards can be

selected ?

91) There are two bags, one bag contains 5 white and 10 red balls. The other

contains 10 white and 7 red balls. What is the probability taking a red ball from

one of the bags ?

a) $55/102$

b) $17/21$

c) $15/17$

d) $7/8$

92) Two decks of cards are there. Each deck contains 20 cards, numbers from 1 to

20 written on them, A card is drawn of random from each deck, getting the

numbers x and y . What is the probability that $\log x + \log y$ is a positive integer.

Logs are taken to the base of 10.

a) $3/200$

b) $29/200$

c) $7/400$

d) $1/50$

93) A box has 13 white clips, 7 blue clips and 6 green clips. What is the probability

that, if 2 clips are drawn from the box in succession, one is blue and other is

white ?

a) $8/30$

b) $7/25$

c) $7/50$

d) $20/26$

94) Five people need to travel in a 5 passengers as there are a driver's seat and a

passenger seat in the front and three passenger seats in the back :a left seat, a

middle seat, and a right seat. Two of the people are children and can sit

only in the back. One of the three adults is busy reading a math book and

refuses to drive. In how many ways can they be seated ?

a) 12

b) 24

c) 18

d) 36

95) . There are certain number of teams of each theme will play with every other

team .If 45 matches were held . how many teams were there.

96) How many palindromes are the between 4000 and 83000?

a)800 b)790 c)890 d)780

97). when two dice are rolled , find the probability of getting a multiple of 3 and 5 as

a sum .

98) Two sides of plot measure 32m, 24m, angle b/w them = 90° other 2 sides are

25m, 25m and other 3 angles are not right angles. If the plot is convex. Find the area

of plot.

a)768 b)534 c)696.5 d)684

99). A tank has 144 liters of spirit , 1st 60 liters is taken out and replaced with

60liters of water for all and countinue3.What
Quantity of sprit in tank after 3 days.

100) Two deck of cards each deck contains 20 cards
with nos 1-20. A card is drawn

at random from each deck getting the nos x & y
respectively. When is the

probability that $\text{LOG}X + \text{LOG} Y$ IS A +VE INTEGER?

101). In the medical times, the sheikdom A1 kurazi
had a proud tradition of

inventing their own measurement units. The unit for
distance was du and the unit

time was pu. Unfortunately exactly what these
measurement units are in modern

terminology has been lost. The skelth of A1 kurazi
had built a huge mansion in the

desert with a circular wall around it and the wall
had 4 gates pointing north

gate,one 135 du to the towers east of the south
gate,one $7 \frac{1}{2}$ du to the east of east

gate.They had been alignes to be all in straight line
passing through the oasis.

What was the diameter of the wall that surrounded by the city?(in du)?

a) 178 b)183 c)180 d)181

102) The value of the scooter depreciates in such a way that its value at the end of

each year is $\frac{3}{4}$ of its value at the beginning of the same year.If the initial value of

the scooter is Rs.39936. What is its value in Rs. At the end of the years.

103) How many of the integers from 1 to 86 contain the digit 4 or have the digit sum

divisible by 4?

104)A bag contains 110 tickets numbered 1,2,3.. 110. If a ticket is drawn out of it

at random, what is the prob of that the ticket drawn has the digit 2 appearing on it.

a) $\frac{22}{110}$ b) $\frac{20}{110}$ c) $\frac{21}{110}$ d) $\frac{31}{11}$

105)When 147 is divided by N the Remainder is 4. 255 is divided by N the Remainder

is 8. 622 is divided by N the Remainder is 11 find N?

2.CLOCKS AND CALENDAR

1)In a particular year, the month of january had exactly 4 thursdays, and 4 sundays. On which day of the week did january 1st occur in the year.

- a) monday
- b) tuesday
- c) wednesday
- d) thursday

Ans: If a month has 31 days, and it starts with sunday, Then Sundays, Mondays, tuesdays are 5 for that month. If this month starts with monday, then mondays, tuesdays, and wednesdays are 5 and remaining days are 4 each. so this month start with Monday.

2)At what time between 6 and 7 are the hands of the clock coincide?

Ans. Total = 3600

For hour = $360/12 = 300/\text{hr}$

For Minute = full rotation = $3600/\text{hr}$

Let the line is 't' , for 6 = $6*30=1800$

then

$$30 t + 180=360 t$$

$$330t = 180$$

$$t = 180/330$$

$$t = 6/11 \text{ hr } 6/11 * 60 = 360/11 = 32 \frac{8}{11}$$

Ans. is 6:32

3). When asked what the time is, a person answered that the amount of time left is $\frac{1}{5}$ of the time already completed. What is the time.

- a. 8 pm
- b. 8 am
- c. 12 pm
- d. 12 am

Answer: a

4). In a particular year, the month of January had exactly 4 Thursdays, and 4 Sundays. On which day of the week did January 1st occur in the year.

- a. Monday
- b. Tuesday
- c. Wednesday
- d. Thursday

Answer: a

5). How many degrees will the minute hand move, in the same time in which the second hand moves 4800°?

- a. 60
- b. 90
- c. 40
- d. 80

Answer: Option d

6). How many years have 29 days in February from 2001 to 2100.

- a.26
- b.25
- c.23
- d.24

Answer: option d

7). 2012 January 1st is Sunday, then which day is the Indian Independence day of the same year.

- a.Saturday
- b.Wednesday
- c.Thursday
- d.Friday

Answer: Option b

8.) Which year has the same calendar as 1700 ?

- a. 1705
- b.1706
- c.1707
- d.1708

Answer: Option b

9). If Arun's birthday is on May 25 which is Monday and his sister's birthday is on July 13. Which day of the week is his sister's birthday?

- a.Monday
- b.Wednesday
- c.Thursday
- d.Friday

Answer: option a

10).March 1st is Wednesday. Which month of the same year starts with the same day?

- a.October
- b.November
- c.December
- d.None of these

Answer: Option b

11)What is the angle between two hands when time is 5:30?

- a)20Degrees b)18.75Degrees c)160 Degrees
- d)15Degrees

ans)d.

12)The famous church in the city of Kumbakonam 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 minutes every hour. What will be the actual

time when the faulty clock shows 3 P.M on Friday?

- a)1.10am b)1.40am c)12.10am d)12.10pm

ans)a.

13)How many times do the hands of a clock coincide in 5 hours?

a)5 b)4 c)6 d)3

ans)b.

14)What is the chance that a leap year selected at random

contains 53 Fridays?

a) $1/7$ b) $3/7$ c) $2/7$ d) $2/13$

ans)c.

15)Between 9 a.m and 9 p.m of a particular day for how many

times are the minute and hour hands together?

a)11 b)12 c)9 d)13

ans)a.

16)How many palindromes are there in a clock from noon to midnight

(For Example 5.45 is a palindrome)?

a)43 b)51 c)57 d)58

ans)c.

18) One quarter of the time till now from midnight and half of the

time remaining from now up to midnight adds to the present time.

What is the present time?

a) 9.38 b) 9.56 c) 9.36 d) 9.16

ans) c.

19) A clock loses 1% time during first week and then gains 2% time

during the next one week. If the clock was set right at 12 noon

on Sunday, what will be the time exactly that the clock will

show 14 days from the time it was set right?

a) 1:30:48 PM b) 1:40:48 PM c) 1:40:38 PM d) 1:30:38 PM

ans) b.

20) Average marks of a, b, c is 48. When d joins, average becomes 47.

E has 3 more marks than d. Average marks of b, c, d, e is 48.

What is the mark of a?

a)46 b)43 c)49 d)53

ans)b.

21)On a certain assembly line, the rejection rate for Hyundai i10s

production was 4 percent, for Hyundai i20s production 8 percent

and for the 2 cars combined 7 percent. What was the ratio of

Hyundais i10 production?

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

ans)a.

22)For a car there are 5 tyres including one spare tyre(4+1).

All tyres are equally used. If the total distance travelled

by the car is 40000km then what is the average distance

travelled by each tyre?

a)10000 b)40000 c)32000 d)8000

ans)c.

23) Two alloys A and B are composed of two basic elements.

The ratios of the compositions of the two basic elements

in the two alloys are 5:3 and 1:2, respectively. A new alloy

X is formed by mixing the two alloys A and B in the ratio 4:3.

What is the ratio of the composition of the two basic elements

in alloy X?

a) 1:1 b) 2:3 c) 5:2 d) 4:3

ans) a.

24) In a barrel 729 ml of oil. N amount of oil is replaced by water.

If the process continues for the 6 times and find the amount

of oil will be?

a) $729(1 - n/729)^6$ b) $(729 - n/729)^6$ c) $(729(1 - n/729)^4$ d) $(729(1 - n/729)^2)^3$

25) A solution of 25 litres contains 20% sugar, if 10 litres of the

solution is evaporated, find the percentage of sugar in the final solution?

a)27.5% b)20% c)25% d)33.33%

ans)d.

26)A milk man mixed 1 : 4 solution of milk and water with another

1 : 2 solution of milk and water in the volume of ratio 3 : 2.

If the profit earned by selling the first solution was 20% and

the mixture was sold at the same price, what is the profit or

loss percentage? You have to assume that water comes free of cost.

a)5.26% profit b)5.25% loss c)6.25% loss d)Cannot determined

ans)b. In a clock the long hand is of 8cm and the short hand is of 7cm.

27)if the clock runs for 4 days find out the total distance

covered by both the hands?

- A 1296 pie
- B 1380 pie
- C 84 pie
- D 1500 pie

ans)a.

28)In a particular year, the month of january had exactly 4 thursdays,

and 4 sundays. On which day of the week did january 1st occur

in the year?

- A Monday
- B Tuesday
- C Wednesday
- D Thursday

ans)a.

29). In 2003 there are 28 days in February and 365 days in a year in 2004 there are 29 days in February and 366 days in the year. If the date march 11 2003 is Tuesday, then which one of the following would the date march 11 2004 would be?

Ans: If 11-3-2003 is Tuesday, Then 11-3 - 2004 is Thursday The number of odd days between the two dates are $[366/7] \text{Rem} [366/7] \text{Rem} = 2$

30) If A, B and C are three positive integers such that A is greater than B and B is greater than C, then which of the following is definitely true?

A. A% of B is greater than B% of C. B. B% of A is greater than C% of B
C. C% of A is greater than B% of C

a. B & C only b. A only c. A, B and C d. A and B

31) In a certain city, 60 percent of the registered voters are PARTY B supporters and the rest are PARTY A supporters. In an assembly election, if 75 percent of the registered PARTY B supporters and 20 percent of the V registered PARTY A supporters are expected to vote for Candidate A, what percent of the registered voters are expected to vote for Candidate A?

a. 53 b) 20 c) 60 d) 75

4) Apple cost Rs. L per Kg for first 30kg and Rs Q per Kg for each additional Kg. If the price paid for 33 Kg apple is 11.67 and for 36 Kg of apple is 12.48. Then the cost of first 10 kgs of apple is?

5) Roshan is proud of his swiss watch that he got as birthday gift from his father. Roshan likes her brother and on one occasion she said

Ans 310

6) If 50% of the 2:3 solution of milk and water is replaced with water. What is the concentration of the solution is required?

(a) 20% (b) 40% (c) 60% (d) 30%

7) Total income of 2012, 2013, 2014 is Rs.48412.
Every year the salary increases

by 20%. What was the salary in 2012?

(a) Rs.12,000 (b) Rs.13,300 (c) Rs.9800 (d) Rs.15,000

8) There are 5 boxes in a cargo hold. The weight of the first box is 300 kg and the

weight of the second box is 40% higher than the weight of the third box, whose

weight is 30% higher than the first box's weight. The fourth box at 400 kg is 50%

lighter than the fifth box. Find the difference in the average weight of the four

heaviest boxes and four lightest boxes.

(a) 90 (b) 125 (c) 77 (d) 116

9) In a country, 60% of the male citizens and 70% of the female citizens are

eligible to vote. 70% of the male citizens eligible to vote voted, and 60%

of female citizens eligible to voted. What fraction of the citizens voted during the

election?

(a) 0.49 (b) 0.42 (c) 0.48 (d) 0.54

10) In a certain city 60 percent of the registered voters are party b supports and the rest are party a supports in an assembly election if 75 percent of the registered party b supports and 20 percent of the registered party a supports are expected to vote for candidate a. what percent of the registered voters are expected to vote for candidate a?

- A. 53
- B. 20
- C. 60
- D. 75

11) .A store is selling a jacket on sale at 31% off the marked price. A matching pair of pants is on sale at 50% off the marked price. If the marked price of the pants

is Rs.11600 less than the marked price of the jacket and the total sale price of

both items is Rs.14600. Then what is the marked price of the jacket ?

a) 17000

b) 16700

c) 16900

d) 17100

12) Drink more coffee is a coffee shop with a peculiar scheme. The shop keeps a

weekly tally for each customers' first coffee cost Rs. 45. The second coffee Rs.

40.5 , Third costs Rs. 36 and so on. The cost goes by Rs.4.5 until the price

reaches Rs.4.5. The remaining coffee that week are free for the customers

13) A petrol tank is already $(\frac{2}{3})$ rd filled. When 8 litre is added it is filled by $(\frac{5}{6})$ th

of the tank. Find the tank capacity.

a) 30

b) 24

c) 48

d) 32

14) Two jars having a capacity of 3 and 5 litres are filled with milk and water. In the

smaller jar 25% of mixture is milk. In the larger jar 25% of mixture is water. The

jars are spilled into a 10 litres can, whose remaining capacity is filled up with

water. Find the % of milk in the can.

15) If A,B,C are three integers such that A is greater than B and B is greater than C,

then which of the following is definitely true?

I) A% of B is greater than B%C

II) B% of A is greater than C%B

III) C% of A is greater than B%C

a) I only

b) II only

16) 60% of the company are men. Remaining are women. If 25% the men are the

given a salary of more than 3 lakh and if 25% of the company employees are given

a salary of more than what fraction of women are getting 3 lakh are lesser?

a) $1/10$ b) $3/10$ 14) 60 c) $1/15$ d) $2/3$

17) Six years ago raj father's age is 6 times the age of Raj. The different present age

is 35. What is the sum of their present ages?

18) Anand packs 304 marbles into packets of 9 or 30 that no marbles is left. Anand

wants to maximize the number of bags with a marbles. How many bags does he

need if there should be at least one bag with 11 marbles

a) 36 b) 8 c) 24 d) 32

19). 2 o'e with enter P and R cut each others at 2 distinct point A and B . The o'es

have the same radii and neither P nor Q fails within the interaction of the o'es.

What is the smallest angle that includes all possible values of the \angle AOP in

degree ?

a) between 0 and 90 b) between 0 and 75 c) between 0 and 30 d) between 0 and

e) between 0 and 60

20) A store is selling a jacket on sale 30% off the market price. A machine pair of

pants is on sale at 50% of the marked price of the marked price. If the m.p of the

pants is 11600 RS less than the marked price of the jacket and the total sale price

of the both items is RS 14600 & then what is the marked price of the jacket?

a) 17000 b) 16700 c) 16900 d) 17100

21). A solid wooden toy is in the shape of a right circular cone mounted on a

hemisphere, such that the circular base of the cone rests on the flat circular area of

hemisphere. The radius of the hemisphere is equal to the radius of the circular

base of the cone. If the radius of hemisphere is 4.2 cm & the total height of the toy

is 10.2 cm, find the volume of the wooden toy.

1.266cm² b)104 cm³ c)162 cm³ d)424 cm³

22). 5 people need to travel in a 5 passenger car .there is a driver seat and a

passenger seat in the front and 3 passengers seat in the back, a left seat , a middle

seat and the right seat.Two of the people are children and can sit only at the back

.one of the 3 adults is busy reading a math book and refuse to drive .in how

many ways can they get seated?

a.12 b.24 c.18 d.6

23)The avg temperature on tues,wed,thurs,fri is 46°C on Friday,temp is

43°C.What was the temp on tues?

24) Cost of the apple for 1st 30 kg is \underline{L} Rs/kg. \underline{Q} Rs/kg for each additional kg. Price for 33 kg is given as Rs.1167 and 36 kg is Rs.1284. Then the cost of 1st 10 kg of apple is?

(a) Rs.117 (b) Rs.1053 (c) Rs.350 (d) Rs.281

3.PERMUTATIONS AND COMBINATIONS

1) How many 5's will be there in the number 121,122,123,... till 356 ?.

A 48

B 49

C 50

D

51

1) If there are Six periods in each working day of a school, In how many ways can one arrange 5 subjects such that each subject is allowed at least one period?

Ans. To arrange 6 periods with 5 subjects, then one subject can be arranged in two slots.

5 Subjects can be arranged in 6 periods in $6P_5$ ways and now we have 1 period which we can fill with any of the 5 subjects in 5 ways. so $6P_5 \times 5 = 3600$

Alternate method:

Assume the subjects are X_1, X_2, A, B, C, D . Here X is the subject which repeats. So arranging 6 objects in 6 places will be equal to $6! = 720$ (here no need to divide this number with $2!$ as even though the subject is same, but not identical)

But this repeated subject can be any of the five. So total arrangements are $720 \times 5 = 3600$

2) 4 Women & 6 men have to be seated in a row given that no two women can sit together. How many different arrangements are there.

Sol : Let us first sit all the 6 men in 6 positions in $6!$ ways. Now there are 7 gaps between them in which 4 women can sit in $7P_4$ ways.

So total ways are $6! \times 7P_4$

3) A student can select one of 6 different math book, one of 3 different chemistry book & one of 4 different science book. In how many different ways students can select book of math, chemistry & science.

Sol: $6C_1 \times 3C_1 \times 4C_1 = 6 \times 3 \times 4 = 72$ ways

1 There is a hall consisting of 23 people. They are shaking hands together. So how many hands shakes possible if they are in a pair of cyclic sequence?

- a) 23
- b) 22
- c) 253
- d) 250

Answer: c) 253

Solution:

Since there are 23 people, number of handshakes possible = $23C2 = 253$ handshakes.

2 A sequence of an alpha-numeric is to be formed.

The sequence consisting of two alphabets followed by two numbers is to be formed with no repetitions.

In how many ways can it be formed?

- a. 65000

b. 64320

c. 58500

d. 67600

Answer: c) 58500

Solution:

The first can be filled in 26 ways.

The second place can be filled in 25 ways.

The third place can be filled in 10 ways.

The last digit can be filled in 9 ways

34) . Sum of the 66 consecutive integers is 5181, then sum of the squares is?

35) How many palindromes are the between 4000 and 83000?

a)800 b)790 c)890 d)780

36)A number when divided by 50 leaves a remainder 10. The same number when

divided but 80 leaves a remainder n. How many values can n take ?

37)How many 6 digit even no's can be formed from the digits 1-7. So that the

digits should not repeat. And second last digit must also be even.

38)How many 1's are present from 149 to 389?

		c.	d.
a.92	b. 93	94	95

3)There is a fairy island where lives a Knight, a

Knave, and a Spy. You go there and meet three

people suppose A, B, and C, one of whom is a knight, one a knave, and one a spy. It is known that the knight always tells the truth, the knave always lies, and the spy can either lie or tell the truth.

- *A says: "C is a knave."*
- *B says: "A is a knight."*
- *C says: "I am the spy."*

So who is the knight, who the knave, and who the spy?

Answer: A = Knight, B = Spy, C = Knave

Solution:

Let us say A is the Knight, then he speaks the truth and C is Knave who lied and finally B is Knave, who speaks the truth regarding A. So this condition holds.

Let us say B is the knight. then it contradicts the answer since a knight always speaks the truth and there cannot be two knights.

Same goes with C.

4 According to a particular code language, A=0, B=1, C=2, ..., Y=24, Z=25 then can will ONE+ONE (in the form of alphabets only) be coded?

- a) DABI
- b) CIDA
- c) BDAI
- d) ABDI

Answer: c) BDAI

Solution:

This is a 26 base question. Just like there is the Decimal system consisting of 10 digits from 0 to 9, the

Base 26 system consist of 26 alphabets where A = 0, B = 1, Z = 25 and so on.

Let's calculate, O N E + O N E

For E(4),

$$\Rightarrow E + E$$

$$\Rightarrow 4 + 4$$

$$\Rightarrow 8$$

$$\Rightarrow I$$

For N(13),

$$\Rightarrow 13 + 13$$

$$\Rightarrow 26$$

*On converting 26 to Base 26 we get 1 0. Keeping 0(A)
and taking 1 as carry*

For O(14),

$$\Rightarrow O + O + 1$$

$$\Rightarrow 29$$

Dividing 29 by 26 we get 1(B) 3(D)

So answer is BDAI

5 In how many possible ways you can write 3240 as
a product of 3 positive integers?

- a) 320
- b) 420
- c) 350
- d) 450

Answer: d) 450 ways

Solution:

First let's prime factorize the number $3240 =$

Let the three positive numbers be x, y and z

We have to distribute three 2's to x, y and z ways in

$(3+3-1)C(3-1) = 5C2$ ways = 10 ways

We have to distribute four 3's to x, y, z in $(3+4-1)C(3-1) = 6C2$ ways

We have to distribute one 5 to x, y, z in 3 ways.

The total number of ways = $10 \times 15 \times 3 = 450$ ways.

6 If VXUPLVH is written as SURMISE, what is SHDVD written as?

a) PEASA

b) PBASA

c) PEBSB

d) None of the above

Answer: *a) PEASA*

Solution:

It is a question of coding-decoding where,

V is written as S ($V - 3 = S$)

X is written as U ($X - 3 = U$)

and so on.

Similarly, SHDVD will be written as PEASA

7`In the range of 112 to 375, how many 2's are there?

a) 312

b) 156

c) 159

d) 160

Answer: b) 156

Solution:

The total number of 2's in the units place = (122, 132, 142 ... 192), (201, 212, 222, ... 292), (302, 312, ... 372) = 8 + 10 + 8 = 26 2's

The total number of 2's in tenth's place = (120, 121, 122, ..., 129) + (220, 221, ..., 229) + (320, 321, ..., 329) = 30

The total number of 2's in hundred's place = (200, 201, ... 299) = 100.

*So the total number of 2's between 112 and 375 = 26
+ 30 + 100 = 156*

8 What will be the 55th word in the arrangement of the letters of the word PERFECT?

- a) CEPFRET
- b) CEPFERT
- c) CEPERFT
- d) CEPRFET

Answer: b) CEPFERT

Solution:

*Let's arrange the word PERFECT in dictionary order =
CEEFPRT*

Here,

$$CEE(4!)=24$$

$$CEF(4!)=24$$

$$CEPF(3!)=6$$

So the 55th word is CEPFERT.

9 There is a set of 26 questions. For each wrong answer, five marks were deducted and eight points were added for each correct answer. Assuming that all of the questions were answered, and the score was 0, how many questions were answered correctly?

a) 12

b) 10

c) 11

d) 13

Answer: b) 10

Solution:

This can be easily solved using hit and trial method.

*Let's consider the first option. If 12 questions in all are answered correctly, then the total score = $12 * 8 = 96$ marks.*

*If 12 questions are answered correctly, then 14 questions were wrongly answered. So total deductions = $14 * 5 = 70$ marks.*

So total score = $96 - 70 = 26$ which is not correct.

*Let's consider the second option. If 10 questions in all are answered correctly, then the total score = $10 * 8 = 80$ marks.*

*If 10 questions are answered correctly, then 16 questions were wrongly answered. So total deductions = $16 * 5 = 80$ marks.*

So total score = $80 - 80 = 0$

Hence 10 is the correct option.

10 Aman owes Bipul Rs 50. He agrees to pay Bipul over a number of the consecutive day starting on Monday, paying a single note of Rs 10 or Rs 20 on each day. In how many different ways can Aman repay Bipul. (Two ways are said to be different if at least one day, a note of a different denomination is given)

a) 5

b) 6

c) 7

d) 8

Answer: *d) 8*

Solution:

*Aman can pay Bipul in all 10 rupees note in 5 days =
 $5 * 10 = 50$ rupees = 1 way*

*Aman can pay Bipul in 3 ten rupee note and 1 twenty
rupee note = $4!/(3! * 1!) = 4$ ways*

*Aman can pay Bipul in 1 ten rupee note and 2 twenty
rupee note = $3!/(1! * 2!) = 3$ ways*

So in all Aman can pay Bipul in 8 ways.

4) find the total number of combinations of 5 letters
a,b,a,b,b taking some or all at a time?

Ans: 1 letter can be chosen in 2 ways. a or b

2 letters can be chosen in 3 way. aa, ab, bb

3 letters can be chosen in 3 ways. bbb, aab, bba

4 letters can be chosen in 2 ways. aabb, bbba

5 letters can be chosen in 1 way.

So total ways are 11

5) what is the sum of all the 4 digit numbers that can be formed using all of the digits 2,3,5 and 7?

Ans: use formula $(n-1)! \times (111\dots n \text{ times}) \times (\text{Sum of the digits})$

here n is number of different letters

So answer is $3! \times 1111 \times 17$

6) A owes B Rs.50. He agrees to pay B over a number of consecutive days on a Monday, paying single note or Rs.10 or Rs.20 on each day. In how many different ways can A repay B.

He can pay by all 10 rupee notes = 1 way

3 Ten rupee + 1 twenty rupee = $4!3! \times 1! = 4$ ways

1 Ten rupee + 2 twenty rupee notes = $3!2! \times 1! = 3$ ways

Total ways = $1 + 4 + 3 = 8$

2. In how many ways a team of 11 must be selected from 5 men and 11 women such that the team must comprise of not more than 3 men?

a. 1565

b. 1243

c. 2256

d. 2456

Ans: C

Explanation;

The team may consist of 0 men + 11 women, 1 men + 10 women, 2 men + 9 women, or 3 men + 8 women.

So Number of ways are

$$= {}^{11}C_{11} + 5{}^5C_1 \times {}^{11}C_{10} + 5{}^5C_2 \times {}^{11}C_9 + {}^{11}C_{11} + 5{}^5C_1 \times {}^{11}C_{10} + 5{}^5C_2 \times {}^{11}C_9 + 5{}^5C_3 \times {}^{11}C_8 + 5{}^5C_3 \times {}^{11}C_8 = 2256$$

1. In how many ways a team of 11 must be selected from 5 men and 11 women such that the team must comprise of not more than 3 men?

- a. 1565
- b. 1243
- c. 2256
- d. 2456

Answer: C

10. Find the number of ways a batsman can score a double century only in terms of 4's & 6's?

- a. 15
- b. 16
- c. 17
- d. 18

Answer: b

Question 1

Find no of ways in which 4 particular persons a, b, c, d and 6

more persons can stand in a queue so that A always stand

before B. B always stand before C, And C always stand before D?

A 6!

B 7!

C $10C6 \cdot 6!$

D $10C4 \cdot 4!$

ans)b.

Question 2

There are 10 points on a straight line AB and 8 on another

straight line AC none of them being point A. how many

triangles can be formed with these points as vertices?

A 680

B 720

C 816

D 640

ans)d.

Question 3

Find the number of ways a batsman can score a double century

only in terms of 4's & 6's?

A 15

B 16

C 17

D 18

ans)b.

Question 4

How many positive integers not more than 4300 of digits

0, 1, 2, 3, 4 if repetition is allowed?

A 560

B 565

C 575

D 625

ans)c.

Question 5

In a 3x3 square grid comprising 9 tiles, each tile can be

painted in red or blue colour. When the tile is rotated by

180 degrees, there is no difference which can be spotted.

How many such possibilities are there?

- ☐ A 16
- ☐ B 32
- ☐ C 64
- ☐ D 256

ans)b.

Question 6

How many 6 digit even numbers can be formed from

1 2 3 4 5 6 7 so that the digit should not repeat and the second last digit is even?

- ☐ A 6480
- ☐ B 320
- ☐ C 2160
- ☐ D 720

ans)d.

Question 7

How many vehicle registration plate numbers can be formed

with digits 1,2,3,4,5 (no digit being repeated)if it's given

that registration number can have 1 to 5 digits?

A 205

B 100

C 325

D 105

ans)c.

Question 8

There are 20 persons sitting in a circle. In that, there are

18 men and 2 sisters. How many arrangements are possible,

in which the two sisters are always separated by a man?

A $18! \cdot 2$

B $17!$

C $17! \cdot 2$

D 12

ans)a.

Question 9

A number plate can be formed with two alphabets followed by

two digits with no repetition. then how many possible

combinations can we get?

A 58500

B 67600

C 65000

D 64320

ans)a.

Question 10

In how many ways a team of 11 must be selected a team 5 men

and 11 women such that the team must comprise of not more

than 3 men.?

A 1234

B 1565

C 2456

D 2256

ans)d.

4.HCF & LCM

17. HCF of 2472, 1284 and a 3rd number, is 12. If their LCM is $8 \times 9 \times 5 \times 103 \times 107$, then what is the number?

- a) $2^2 \times 3^2 \times 7^1$
- b) $2^2 \times 3^2 \times 5^1$
- c) $2^2 \times 3^2 \times 8103$
- d) None of the above.

Answer: b) $2^2 \times 3^2 \times 5^1$

2. $X =$

101102103104105106107.....146147148149150
(From numbers 101-150). Find out the remainder when this number is divided by 9.

- a.4
- b.5
- c.2
- d.1

Answer: c

3)When 147 is divided by N the remainder is 4 When 255 is divided by N the remainder is 8 When 622 is divided by N the remainder is 11 Find N?

3. $7^1 + 7^2 + 7^3 + \dots + 7^{205}$. Find out how many numbers present which unit place contain 3?

a. 44

b. 51

c. 25

d. 65

Answer: b

4. Given that $0 < a < b < c < d$, which of the following is the largest?

a. $(c+d) / (a+b)$

b. $(a+d) / (b+c)$

c. $(b+c) / (a+d)$

d. $(b+d) / (a+c)$

Answer: A

8. A two digit number is 18 less than the square of the sum of its digits. How many such numbers are there?

a. 1

b. 2

c. 3

d. 4

Answer: Option 2

10. Find L.C.M. of 1.05 and 2.1

a. 1.3

b. 1.25

c. 2.1

d. 4.30

Answer: c

11. Find the greatest number that will divide 148, 246 and 623 leaving remainders 4, 6 and 11 respectively?

a) 20 b) 12 c) 6 d) 48

ans) b.

12. For any two numbers we define an operation $\$$ yielding another number, $X \$ Y$ such that following condition holds: $\bullet X \$ X = 0$ for all X $\bullet X \$ (Y \$ Z) = X \$ Y + Z$ Find the Value of $2012 \$ 0 + 2012 \$ 1912$?

a) 2112 b) 100 c) 5936 d) Cannot be determined

ans) a.

13. If $A = x^3y^2$ and $B = xy^3$ then find the HCF of A, B?

a) x^4y^4 b) XY^2 c) XY d) X^3

ans) b.

14. In how many possible ways can you write 1800 as a product of 3 positive integers a, b, c

a) 350 b) 360 c) 380 d) 450

ans) b.

15. A number when successively divided by 5, 3, 2 gives remainder 0, 2, 1 respectively in that order. What will be the remainder when the same number is divided successively by 2, 3, 5 in that order?

a)4,3,2 b)1,0,4 c)2,1,3 d)4,1,2

ans)b.

16. When 100 is to be successively divided by 6, 3, 4 first divide 100 by 6 then divide quotient 16 by 3, then divide the quotient by 4

Which of the following numbers must be added to 5678 to give a remainder 35 when divided by 460?

a)980 b)797 c)955 d)618

ans)b.

What will be the remainder when $(1234567890123456789)^{24}$ is divided by 6561?

a)7 b)5 c)3 d)0

ans)d.

The remainder when $m + n$ is divided by 12 is 8, and the remainder when $m - n$ is divided by 12 is 6. If $m > n$, then what is the remainder when mn divided by 6?

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

ans)d.

A number 2088 by what if we divide the number it will become a perfect square?

a)58 b)20 c)28 d)29

ans)a.

5.PERCENTAGE

1)In a city 100% votes are registered, in which 60% vote for congress and 40% vote for BJP. There is a person A, who gets 75% of congress votes and 8% of BJP votes. How many votes got by A?

Assume total votes are 100. So A got

75% of 60 = 45

8% of 40 = 3.2

A total of 48.2 %

1.If the price of an item is decreased by 10% and then increased by 10%, the net effect on the price of the item is

A. A decrease of 99%

B. No change

C. A decrease of 1%

D. An increase of 1%

Answer: C

2..You need a 18% acid solution for a certain test, but your supplier only ships a 13% solution and a 43% solution. You need 120 lts of the 18% acid solution. the 13% solution costs Rs 82 per ltr for the first 67 ltrs, and Rs 66 per ltr for any amount in excess of 67 ltrs. What is the cost of the 13% solution you should buy?

- a. 8002 b. 7012
c. 7672 d. 7342

Answer: C

3..A spherical solid ball of radius 58 mm is to be divided into eight equal parts by cutting it four times longitudinally along the same axis. Find the surface area of each of the final pieces thus obtained(in mm^2) ? (where $\pi = \frac{22}{7}$)

- a. 3365π b. 5046π
c. 1682π d. 3346π

Answer: B

4.If the price of an item is decreased by 10% and then increased by 10%, the net effect on the price of the item is

- A. A decrease of 99%

B. No change

C. A decrease of 1%

D. An increase of 1%

Answer: C

4. Overfishing is a serious environmental issue. The scientists were able to determine that if the net of a trawler has a mesh size of 'x' cm (a square mesh), then the percentage of fish entering the net is caught in the net is expressed in form of the quadratic equation, $100 - 0.04x^2 - 0.24x$. For example, if the mesh size is zero, 100% of the fish that enter the net will be caught. A trawler with a net with a square mesh, that was suspect of using an illegal size net, dropped its net to the ocean floor near the Lakshadweep and the coast guard, arrested the

crew. It was later looked at the size of the fish caught and estimated that for the net used by the trawler, at least 97.8% of the fish entering the net would be caught. What is the maximum value of x for the net used by the trawler?

a) 7

b) 4.5

c) 6

d) 5

Answer: *d) 5*

Solution:

According to the question,

for few values of x , the total fish caught is 97.8%. So

$$\Rightarrow 100 - 0.04x^2 - 0.24x = 97.8$$

$$\Rightarrow 0.04x^2 + 0.24x = 2.2$$

$$\Rightarrow 4x^2 + 24x = 220$$

$$\Rightarrow x^2 + 6x - 55 = 0$$

Solving, we get $x = 5$ and -11

So, the value of $x = 5$ has to be positive and hence the answer.

1 There is a city where all 100% votes are registered.

Among this 60% votes for Congress and 40% votes for

BJP. Ram, gets 75% of congress votes and 8% of BJP votes. How many votes did Ram get?

a) 48.2 %

b) 56.6 %

c) 42.8 %

d) 64.4 %

Answer: *a) 48.2 %*

Solution:

Let the total number of votes = 100. So Ram gets,

*75% of 60 = $60 * 0.75 = 45$ votes*

*8% of 40 = $40 * 0.08 = 3.2$ votes*

Thus total number of votes that Ram gets = 48.2 %

2 The marked price of a shirt was 40% less than the suggested retail price. Ram purchased the coat for half of the marked price at the 15th-anniversary sale. What per cent less than the suggested retail price did Ram pay?

a) 70%

b) 20%

c) 60%

d) 30%

Answer: a) 70%

Solution:

Let the retail price of the shirt be Rs. 100

So according to the question, the market price will be

$$= 100 \times 0.6 = 60$$

$$\text{Purchased price of Ram} = 60/2 = 30$$

which is 70% less than retail price.

1. In paper A, one student got 18 out of 70 and in paper B he got 14 out of 30. In which paper he did fare well?

a. 45.3

b. 46.6

c. 34.8

d. 44.3

Answer : b

4. 5000 voted in an election between two candidates. 14% of the votes were invalid. The winner won by a margin approximately closer to 15%. Find the number of votes secured by the person

a. 2213

b. 3421

c. 2472

d. 2134

Answer: c

5. A survey of n people in the town of badaville found that 50% of them prefer brand A. Another survey of 100 people in the town of chottaville found that 60% prefer brand A. In total 55% of all the people surveyed together prefer Brand A. What is the total number of people surveyed?

- a. 35
- b. 49
- c. 92
- d. 100

Answer: d

6. In a city 100% votes are registered, in which 60% vote for congress and 40% vote for BJP. There is a person A, who gets 75% of congress votes and 8% of BJP votes. How many votes got by A?

- a. 44.3%
- b. 48.3%
- c. 48.2%
- d. 44.1%

Answer: c

8. Half of 1 percent written as decimal is

- a. 5
- b. 0.5
- c. 0.05
- d. 0.005

Answer: Option D

9. Evaluate $28\% \text{ of } 450 + 45\% \text{ of } 280$

- a. 232

b.242

c.252

d.262

Answer: Option C

10.How many litres of pure acid are there in 8 litres of a 20% solution

a.1.5

b.1.6

c.1.7

d.1.8

Answer: Option B

6.ALLEGATIONS AND MIXTURES

1)There are five boxes in a cargo. The weight of the first box is 200 kg and the weight of the second box is 20 % higher than the weight of the third box, whose weight is 25% higher than the weight of the first box. The fourth box which weighs 350 kg is 30% lighter than the fifth box. Find the difference in the average weight of the four heaviest boxes and four lightest boxes.

a. 75 kg

b. 51.5 kg

c. 65 kg

d.
37.5

1) A beaker contains 180 liters of alcohol. On 1st day, 60 l of alcohol is taken out and replaced by water.

2nd day, 60 l of mixture is taken out and replaced by water and the process continues day after day.

What will be the quantity of alcohol in beaker after 3 days

Ans: 53.3

Use the formula,

$$\text{Final Alcohol} = \text{Initial Alcohol} \times (1 - \frac{\text{Replacement quantity}}{\text{Final Volume}})^n$$

$$\text{Final Alcohol} = 180(1 - \frac{60}{180})^3$$

$$= 180 \times (\frac{2}{3})^3 = 53.3$$

2. A mixture of 150 liters of wine and water contains 20% water. How much more water should be added so that water becomes 25% of the new mixture?

- A. 7 liters
- B. 15 liters
- C. 10 liters
- D. 9 liters

Answer: Option C

3. A vessel contains 20 liters of a mixture of milk and water in the ratio 3:2. 10 liters of the mixture are removed and replaced with an equal quantity of pure milk. If the process is repeated once more, find the ratio of milk and water in the final mixture obtained?

- A. 9:1
- B. 4:7
- C. 7:1
- D. 2:5

Answer: Option A

4. Two varieties of wheat – A and B costing Rs. 9 per kg and Rs. 15 per kg were mixed in the ratio 3 : 7. If 5 kg of the mixture is sold at 25% profit, find the profit made?

- A. Rs. 13.50
- B. Rs. 14.50
- C. Rs. 15.50
- D. Rs. 16.50

Answer: Option D

5. In a mixture of milk and water, the proportion of milk by weight was 80%. If, in a 180 gm mixture, 36 gms of pure milk is added, what would be the percentage of milk in the mixture formed?

- A. 80%
- B. 100%
- C. 84%
- D. 87.5%
- E. None of these

Answer: Option E

7. A mixture of 70 litres of milk and water contains 10% water. How many litres of water should be added to the mixture so that the mixture contains $12\frac{1}{2}\%$ water?

- A. 2
- B. 8
- C. 4
- D. 5
- E. None of these

Answer: Option A

8. All the water in container A which was filled to its brim was poured into two containers B and C. The quantity of water in container B was 62.5% less than the capacity of container A. If 148 liters was now transferred from C to B, then both the containers would have equal quantities of water. What was the initial quantity of water in container A?

- A. 648
- B. 888
- C. 928
- D. 1184
- E. None of these

Answer: Option D

Question 1

How many litres of a 90% of concentrated acid needs to be

mixed with a 75% solution of concentrated acid to get a 30

litre solution of 78% concentrated acid?

A 8

B 9

C 7

D 6

ans)d.

Question 2

Average marks of a,b,c is 48. When d joins average becomes 47.

E has 3 more marks than d. Average marks of b,c,d,e is 48.

What is the marks of a?

A 46

B 43

C 49

D 52

ans)b.

Question 3

On a certain assembly line, the rejection rate for Hyundai i10s

production was 4 percent, for Hyundai i20s production 8 percent

and for the 2 cars combined 7 percent. What was the ratio of

Hyundais i10 production?

☐ A 3/1

☐ B 2/1

☐ C 1/1

☐ D 1/2

ans)a.

Question 4

For a car there are 5 tyres including one spare tyre(4+1).

All tyres are equally used. If the total distance travelled

by the car is 40000km then what is the average distance

travelled by each tyre?

☐ A 10000

☐ B 40000

☐ C 32000

☐ D 8000

ans)c.

Question 5

Two alloys A and B are composed of two basic elements.

The ratios of the compositions of the two basic elements

in the two alloys are 5:3 and 1:2, respectively. A new alloy

X is formed by mixing the two alloys A and B in the ratio 4:3.

What is the ratio of the composition of the two basic elements

in alloy X?

☐ A 1:1

☐ B 2:3

☐ C 5:2

☐ D 4:3

☐ E 7:9

ans)a.

Question 6

In a barrel 729ml of oil. N amount of oil is replaced by water.

If the process continues for the 6times and find the amount

of oil will be?

- A $729(1-n/729)^6$
- B $(729-n/729)^6$
- C $729(1-n/729)^4$
- D $729(1-(n/729)^2)^3$

ans)a.

Question 7

Mixture of milk and water has been kept in two separate containers.

ratio of milk to water in one of the containers is 5:1 and that

in the other container is 7:2. in what ratio the mixtures of

these two containers should be added together so that the

quantity of the milk in the new mixture may become 80%?

- A 2:3
- B 1:2

C 14:19

D 3:7

ans)a.

Question 8

A mixture of a certain quantity of milk with 16 litres of

water is worth 90p per litre. if pure milk be worth Rs.1.08

per litre, how much milk is there in the mixture?

A 75

B 80

C 65

D 60

ans)b.

Question 9

A solution of 25 litres contain 20% sugar, if 10 litres of the

solution is evaporated, find the percentage of sugar in the

final solution?

- A** 27.5%
- B** 20%
- C** 25%
- D** 33.33%

ans)d.

Question 10

A milk man mixed 1 : 4 solution of milk and water with another

1 : 2 solution of milk and water in the volume of ratio 3 : 2.

If the profit earned by selling the first solution was 20% and

the mixture was sold at the same price, what is the profit or

loss percentage? You have to assume that water comes free of cost.

- A** 5.26% profit
- B** 5.25% loss
- C** 6.25% loss
- D** None of these

ans)b.

7.RATIO, PROPORTION AND AVERAGES

1. In a vessel, there are 10 litres of alcohol. An operation is defined as taking out

five litres of what is present in the vessel and adding 10 litres of pure water to it.

What is the ratio of alcohol to water after two operations?

(a) 1:5 (b) 2:3 (c) 1:6 (d) 3:2

2) A city in the US has a basketball league with 3 basketball teams, the Aztecs,

the Braves and the Celtics. A sports writer notices that the tallest player of the

Aztecs is shorter than the shortest player of the Braves. The

shortest of the Celtics is shorter than the shortest of the Aztecs, while the tallest of

the Braves is shorter than the tallest of the Celtics. The tallest of the Braves is taller

than the tallest of the Aztecs. Which of the following can be judged with certainty?

X) Paul, a Brave is taller than David, an Aztec

Y) David, a Celtic, is shorter than Edward, an Aztec

(a) X only (b) Both X and Y

(c) Neither X nor Y (d) Y only

3) Perimeter of a equilateral triangle is equal to the perimeter of Hexagon. What is

the ratio of their areas?

(a) 6:1 (b) 1:6 (c) 3:2 (d) 2:3

4) M, N, O and P are all different individuals; M is the daughter of N; N is the

son of O; O is the father of P; Among the following statements, which one is true?

(a) M is the daughter of P

(b) If B is the daughter of N, then M and B are sisters

(c) If C is the granddaughter of O, then C and M are sisters

(d) P and N are bothers

5) Find the ratio of the area of square to area of triangle.

(a) 1:2 (b) 2:1 (c) 2:3 (d) 3:2

6) The prime cost of an article was 3 times the value of materials used the cost of

raw materials increases in the ratio of 3:7 and productive wages 4:9 find the

present prime cost of an article which could formerly be made for Rs.18

A. 46

B. 41

C. 40

D. 30

7) The total cost of articles was 3 times the value of materials used. The cost of

raw materials increases in the ratio of 3:7 and productive wages 4:9. Find the

present prime cost of an article, Which could formally be made for Rs. 18 ?

- a) 46
- b) 41
- c) 40
- d) 30

8) Incomes are in the ratio =5:4

Expenses in ratio =14:11

savings of both of them=Rs 10000

Find A's income

9) Current age of 2 person=25

9yrs before elder one was 6 times than younger.

Find the current ages.

7. There are 100 wine glasses. I offered my servant to 3 paise for every broken glass to be delivered safely and forfeit 9 paise for every glass broken at the end of day. He received Rs.2.40 .how many glass did he break

. a. 20 b. 73 c. 5 d. 8

If a glass has been broken, he has to loose 3 paise + 9 paise = 12 paise Assume K glasses got broken 100
 $x \cdot 3 - 12 \cdot K = 240 \Rightarrow K=5 \Rightarrow K=5$

9. A property was originally on a 99 years lease and two thirds of the time passed is equal to the four fifth of the time to come.how many years are there to go.

a. 45 b. 50 c. 60 d. 55

Assume x years have passed and y years to go Given
 $23x=45y \Rightarrow x=32 \times 45y=65y \Rightarrow x=32 \times 45y=65y$
But $x + y = 99$ So $65y+y=99 \Rightarrow 66y=99 \Rightarrow y=1.5$ Solving we get
 $y = 45$ years

5. Seats for Mathematics, Physics and Biology in a school are in the ratio 5 : 7 : 8. There is a proposal to increase these seats by 40%, 50% and 75% respectively. What will be the ratio of increased seats?

a. 2 : 3 : 4

b. 6 : 7 : 8

c. 6 : 8 : 9

d. None of these

Answer: Option A

6. If $0.75 : x :: 5 : 8$, then x is equal to:

a. 1.12

b. 1.2

c. 1.25

d. 1.30

Answer: Option B

7. The fourth proportional to 5, 8, 15 is:

a. 18

b. 24

c. 19

d. 20

Answer: Option B

8. In a bag, there are coins of 25 p, 10 p and 5 p in the ratio of 1 : 2 : 3. If there is Rs. 30 in all, how many 5 p coins are there?

a. 50

b. 100

c. 150

d. 200

Answer: Option C

Apple costs L rupees per kilogram for first 30kgs and Q rupees

per kilogram for each additional kilogram. If the price of

33 kilograms is 11.67 and for 36kgs of Apples is 12.48 then

the cost of first 10 kgs of Apples is?

a)350 b)1053 c)117 d)281

ans)a.

Of a set of 30 numbers, average of first 10 numbers = average of

last 20 numbers. Then the sum of the last 20 numbers is?

a)2 X sum of first ten numbers b) 2 X sum of last ten numbers c) Sum of first ten numbers d)Cannot determined

ans)a.

The wages of 24 men and 16 women amounts to rs 11600 per day.

if half of the men and 37 women earn same money. the daily

wages paid to each man is?

a)375 b)400 c)350 d)325

ans)c.

Mother, daughter and infant total weight is 74 kg. Mother's

weight is 46 kg more than daughter and infant's weight.

Infant's weight is 60% less than daughter's weight. Find

daughter's weight?

a)10 b)4 c)7 d)60

ans)a.

In a certain city, 60% of the registered voters are congress

supporters and the rest are BJP supporters. In an assembly

election, if 75% of the registered congress supporters and

20% of the registered BJP supporters are expected to vote for

candidate A, what percent of the registered voters are

expected to vote for candidate A?

a)53 b)20 c)60 d)75

ans)a.

A sum of 20706 is distributed amongst A, B and C. A gets $\frac{10}{123}$

of what B and C got together and C gets $\frac{1}{10}$ of what A and B

got together, C's share is (approx)?

a)2100 b)1892 c)1882 d)1744

ans)c.

A and B income in the ratio of 5:4, and where expenditure in

the ratio of 14:11 if they save 1000 rs each then what is

the total income of A?

a)17000 b)15500 c)15000 d)14500

ans)c.

The ratio between the number of sheep and the number of horses

at the Stewart farm is 4 to 7. If each of horse is fed 230 ounces

of horse food per day and the farm needs a total 12880 ounces of

horse food per day. what is number sheep in the farm?

a)18 b)28 c)32 d)56

ans)c.

Hari has a piece of cake 60 cm long. He gives Raja half of it.

He then gives Gopal $\frac{1}{4}$ th of what is left. After giving a piece

to Sahi, he is left with $\frac{1}{10}$ th of the original. How much did

he give to Sahil? A. B.C. D.

a)21.5 cm b)16.5cm c)19.5cm d)31.5cm

ans)b.

The ratio of adults and teenagers is 1:30. if teenagers are

increased by fifty and adults by 5 new ratio become 1:25.

What is number of adults at present?

a)11 b)15 c)14 d)12

ans)b.

8. A shop sells chocolates It is used to sell chocolates for Rs.2 each but there were no sales at that price. When it reduced the price all the chocolates sold out enabling the shopkeeper to realize Rs 164.90 from the chocolates alone If the

new price was not less than half the original price quoted How many chocolates were sold?

Sol: $16490 = 2 \times 5 \times 17 \times 97$ Now now chocolate price should be greater than 1 and less than 2. So $2 \times 5 \times 17 = 170$ So Total chocolates sold = 97 and New chocolate price = Rs.1.7

1) A certain sum of money is sufficient to pay either George's wages for 15 days or Mark's wages for 10 days. For how long will it suffice if both George and Mark Work together?

a. 5 b. 9 c. 8 d. 6

2) Daniel can do some work in 12 hours, Roy can do the same work in 10 hours

while Hillary can do the same work in 15 hours. All the three of them start working

at 9 a.m. while Daniel stops working at 11 a.m. and remaining two complete the

work. Approximately at what time will the work be finished?

(a) 130 p.m. (b) 12.30 a.m.

(c) 2.00 p.m. (d) 1.00 p.m.

3) George and Mark work for a company. George can finish a certain job in 30

days. Mark can finish the same job in 45 days. A project was taken by the

company and George was made superior to Mark. This move from the company was

not liked by Mark. So Mark did not work for 15 days. Find the total number of days

the entire work was completed if Mark works at his normal speed after 15 days from

the date of commencement?

(a) 15 (b) 20 (c) 35 (d) 24

4) George and Mark can paint 720 boxes in 20 days. Mark and Harry in 24

days and Harry and George in 15 days. George works for 4 days, Mark for 8 days

and Harry for 8 days. The total number of boxes painted by them is

(a) 252 (b) 516 (c) 348 (d) 492

5) George can do a job in 10 days. Jack can do a job in 15 days. How much each

will get if the total wage is 5000 if they work together.

6) 60 men can complete a piece of work in 40 days. 60 men start the work but

after every 5 days 5 people leave. In how many days will the work be completed?

(a) 60 (b) 80 (c) 120 (d) None of these

7) A person walks at 4 km/hr for a particular duration T_1 and 3 km/hr for

another duration T_2 and covers a total distance of 36 km. If he walks at 4 km/hr

for the duration T_2 and at 3 km/hr for the duration T_1 , then he covers only 34 km.

What will be the time taken by him to cover the one of the legs?

(a) 4 hrs (b) 7 hrs (c) 10 hrs (d) 6 hrs

8) Raju can do a piece of work in 10 days, Vicky in 12 days, Tinku in 15 days.

They all started work together, but raju leaves after 2 days, Vicky leaves 3 days

before the work is completed. In how many days work is completed?

(a) 7 (b) 5 (c) 9 (d) 6

9) A certain sum of money is sufficient to pay either George wages for 15 days or

Mark wages for 10 days for how long will it be sufficient if both George and

Mark work together

A. 5

B. 6

C. 8

D. 9

10) Two women Renu and Usha are working on an embroidery design if Usha worked

alone she would need eight hours more to complete the design than if they both

worked together now if renu worked alone it would need 4.5 hrs more to

complete the design than they both working together what time would it take

renu alone to complete the design ?

A. 10.5 hrs

B. 12.5 hrs

C. 14.5 hrs

D. 18.5 hrs

11) George can do some work in 8 hrs paul can do the same work in 10 hrs while

hari can do the same work in 12 hrs all three of them start working at 9 am

while George stops work at 11 am and the remaining two complete the work

approximately at what time will the work be finished ?

A. 11.30 am

- B. 1 pm
- C. 12.30 pm
- D. 12 noon

12) Three machines P,Q and R print 1 lakh books in 8,10 and 12 hrs respectively.

All the machines started working together at 9.00 a.m. While

machine P is closed at 11.00 a.m. And the remaining two machines complete

the remaining work. Approximately at what time would the work be finished ?

- a) 11.30 a.m
- b) 01.00 p.m
- c) 12.30 p.m
- d) 12 .00 noon

13) George walks 36 kms partly at a speed of 4 kms per hour and partly at 3 km

per hour. If he had walked at a speed of 3 km per hour when he had walked at a 4

and 4 km per when he had walked at 3 he would have walked only 34 kms. The

time (in hours) spent by George walking was

(a) 8 (b) 12 (c) 5 (d) 10

9) Eesha bought two varieties of rice costing 50Rs per kg and 60 Rs per kg and mixed them in some ratio. Then she sold that mixture at 70 Rs per kg making a profit of 20 % What was the ratio of the mixture?

Sol: Selling price of the mixture = 70 and profit = 20%

Cost price of the mixture

$$= 70 \times 100 / 120 = 70 \times 56 / 60 = 70 \times 56 / 60$$

By applying alligation rule:

$$\text{So ratio} = 60 - 1753 : 1753 - 50 = 60 - 1753 : 1753 - 50 = 1 :$$

3. The savings of employee equals income minus expenditure. If the income of A, B, C are in the ratio 1:2:3 and their expense ratio 3:2:1 then what is the order of the employees in increasing order of their size of their savings?

Ans: $A < B < C$

As the the ratio of their incomes are in ascending order, and their expenses are in descending order, their savings also in their incomes order. So savings order = $A < B < C$

4. Entry fee is Re.1.there are 3 rides each is of Re.1. total boys entering are 3000.total income is Rs.7200. 800 students do all 3 rides. 1400 go for atleast 2 rides.none go the same ride twice. then no of students who do not go any ride is?

Ans: 1000

Total entries are 3000 So fee collected through entry fee = $3000 \times 1 = \text{Rs.}3000$ Income generated through rides = $7200 - 3000 = 4200$ Now 800 went for 3 rides so total fee paid by these 800 = $800 \times 3 = 2400$ (1400 - 800) went for 2 rides so fee paid by these 600 = $600 \times 2 = 1200$ Assume K went for exactly 1 ride Then $K \times 1 + 1200 + 2400 = 4200 \Rightarrow K = 600$ So number of boys who did not go for any ride = $3000 - (600 + 600 + 800) = 1000$

3. B alone can do piece of work in 10 days. A alone can do it in 15 days. If the total wages for the work is Rs 5000, how much should B be paid if they work together for the entire duration of the work?

a. 2000 b. 4000 c. 5000 d. 3000

Sol: Time taken by A and B is in the ratio of = 3:2
Ratio of the Work = 2 : 3 (since, time and work are inversely proportional) Total money is divided in the ratio of 2 : 3 and B gets Rs.3000

4. On a 26 question test, 5 points were deducted for each wrong answer and 8 points were added for right answers. If all the questions were answered how many were correct if the score was zero. a. 10 b. 11 c. 13 d. 12

Sol: Let x ques were correct. Therefore, (26- x) were wrong $8x - 5(26 - x) = 0$ $8x - 5(26 - x) = 0$ Solving we get $x = 10$

5. Arun makes a popular brand of ice cream in a rectangular shaped bar 6cm long, 5cm wide and 2cm thick. To cut costs, the company had decided to reduce the volume of the bar by 19%. The thickness will remain same, but the length and width will be decreased by some percentage. The new width will be,

a. 5.5 b. 4.5 c. 7.5 d. 6.5

Sol: Volume = $l \times b \times h$ $l \times b \times h = 6 \times 5 \times 2 = 60$ cm^3 Now volume is reduced by 19%. Therefore, new volume = $(100 - 19) \times 60 = 48.6$ Now,

thickness remains same and let length and breadth be reduced to $x\%$ so, new volume:

$$(x100 \times 6)(x100 \times 5)^2 = 48.6(x100 \times 6)(x100 \times 5)^2 = 48.6$$

Solving we get $x = 90$ thus length and width is reduced by 10% New width = $5 - (10\% \text{ of } 5) = 4.5$

1. Three containers A, B and C are having mixtures of milk and water in the ratio of 1:5, 3:5, 5:7 respectively. If the capacities of the containers are in the ratio 5:4:5, find the ratio of milk to water, if all the three containers are mixed together.

a) 54:115

b) 53:113

c) 53:115

d) 54:113

Answer: c) 53:115

Solution:

Using the weighted average formula we can calculate the weight of milk,

$$\Rightarrow [5*(1/6) + 4*(3/8) + 5*(5/12)]/(5+4+5) = 53/168$$

$$\text{So weight of water} = 168 - 53 = 115$$

$$\text{So the ratio of milk to water} = 53:115$$

5. Aman participates in an orange race. In the race, 20 oranges are placed in a line of intervals of 4 meters with the first orange 24 meters from the starting point. Aman is required to bring the oranges back to the starting place one at a time. How far would he run in bringing back all the oranges?

a) 1440

b) 2440

c) 1240

d) 2480

Answer: d) 2480

Solution:

Since every orange is placed at a difference of 4 meters and the first potato is placed at 24 meters from the starting position. Every orange is placed at 24m, 28m, 32m, 36m,20 terms.

Now to bring ever orange one at a time, Aman needs to cover the double of the distance = 48, 56, 64, ...20 terms.

So putting the values in the sum of AP formula, $a = 48$, $d = 8$, $n = 20$.

*Total distance travelled = $20/2 [2 * 48 + (20-1)*8]$*
= 2480 meters

7. There is a conical tent which can accommodate 10 persons. Each person requires 6 sq.meter space to sit and 30 cubic meters of air to breathe. What will be the height of the cone?

a) 72 m

b) 15 m

c) 37.5 m

d) 155 m

Answer: b) 15 m

Solution:

All the persons are to sit on the ground forming the base of the cone.

*Total base covered = $\pi * 6^2 = 60 \text{ sq-meter}$.*

*The total volume of the tent will be equal to the total air to breathe by the 10 people = $30 * 10 = 300 \text{ cubic meter}$*

$$\text{So, } \frac{1}{3}(\pi * * h) = 300$$

$$\Rightarrow h = 15 \text{ meters.}$$

33) 10 person can stand in a conical tent. each person needs 10m^2 to stand and 60m^3 air to breathe. What is the height of the tent
a) 18 b) 12 c) 36 d) 9

1)The rejection rate for Audi production was 4 per cent, for Mercedes it was 8 per cent and for the 2 cars combined it was 7 per cent. What was the ratio of Audi production?

a) $4/1$

b) $2/1$

c) $3/1$

d) $7/1$

Answer: c) $3/1$

Solution:

Using the simple weighted average formula we get,

$$(4x + 8y)/(x+y) = 7$$

$$\text{or, } 4x + 8y = 7x + 7y$$

$$\text{or, } a/b = 3/1$$

8.WORK AND TIME

2. 4 men can check exam papers in 8 days working 5 hours regularly. What is the total hours when 2 men will check the double of the papers in 20 days?

- a.7 hrs
- b.8 hrs
- c.10 hrs
- d.5 hrs

Answer:b

3.Tony alone can paint a wall in 7 days and his friend Roy alone can paint the same wall in 9 days. In how many days they can paint the wall working together? Round off the answer to the nearest integer.

- a. 3
- b. 4
- c. 5
- d. 7

Answer: Option B

5.Rajiv can do a piece of work in 10 days , Venky in 12 days and Ravi in 15 days. They all start the work together, but Rajiv leaves after 2 days and Venky leaves 3 days before the work is completed. In how many days is the work completed ?

- a. 5
- b. 6
- c. 9

d. 7

Answer: D

6. A man has a job, which requires him to work 8 straight days and rest on the ninth day. If he started work on Monday, find the day of the week on which he gets his 12th rest day.

a. Thursday

b. Wednesday

c. Tuesday

d. Friday

Answer: B

7. B alone can do piece of work in 10 days. A alone can do it in 15 days. If the total wages for the work is Rs 5000, how much should B be paid if they work together for the entire duration of the work?

a. 2000

b. 4000

c. 5000

d. 3000

Answer: d

5. 2 gears one with 12 teeth and other one with 14 teeth are engaged with each other. One tooth in smaller and one tooth in bigger are marked and initially those 2 marked teeth are in contact with each other. After how many rotations of the smaller gear with the marked teeth in the other gear will again come into contact for the first time? a) 7 b) 12 c) Data insufficient d) 84

Correct Option : A Assume the distance between the teeth is 1 cm. Then the circumference of first gear is 12 cm and the second is 14 cm. Now LCM (12, 14) = 84. So to cover 84 cm, the first gear has to rotate $84/12 = 7$ rounds (the second gear rotates $84/14 = 6$ rounds as it is bigger)

1. An exam was conducted and the following was analyzed. 4 men were able to check some exam papers in 8 days working 5 hours regularly. What is the total number of hours taken by 2 men in 20 days to check double the number of exam papers?

Answer: 8 hours

Solution:

Assuming that 1 unit of work is done in 1 hour

Let's calculate the total number of working hours:

$$\Rightarrow 4 * 8 * 5 = 160 \text{ units}$$

Now the work is doubled:

$$\Rightarrow 160 * 2 = 320 \text{ units}$$

Let 'x' be the number of hours taken by 2 men to complete the work in 20 days.

Therefore,

$$\Rightarrow 2 * 20 * x = 320$$

$$\Rightarrow x = 8 \text{ hours (Answer).}$$

2. A takes 3 days to complete a work while B takes 2 days. Both of them finish a work and earn Rs. 150. What is A's share of money?

a) Rs. 70

b) Rs. 30

c) Rs. 60

d) Rs. 75

Answer: c) 60

Solution:

A completes 1/3rd of work in one-day and B completes 1/2 of work in one day. So the ratio of there work is:

$$A:B = 2:3$$

So A's share = $(2/5) \times 150 = 60$ rupees(Answer)

n putting 16, the equation is satisfied, hence the answer.

3. Ram alone can do 1/4th of the work in 2 days. Shyam alone can do 2/3th of the work in 4 days. So what part of the work must be done by Anil in 2 days, for them to complete the work together in 3 days?

- a) 1/8
- b) 1/20
- c) 1/16
- d) 1/12

Answer: d) $1/12$

Solution:

Ram alone can complete the work in $2 \times 4 = 8$ days.

Shyam alone can complete the work in $4 \times (3/2) = 6$ days.

Taking the lcm of 8, 6, 3 = 24

Capacity of Ram = $24/8 = 3$

Capacity of Shyam = $24/6 = 4$

Capacity of Anil = $8 - (4+3) = 1$

Now in 2 days Anil can do 2 unit of work = $2/24 = 1/12$ part of the work

4. Ram alone can paint a wall in 7 days and his friend Roy alone paints the same wall in 9 days. In

how many days they can paint the wall working together? (Round off your answer)

a) 3

b) 5

c) 4

d) 7

Answer: c) 4

Solution:

This can be solved by applying a simple formula =

$$ab/(a+b)$$

*or, $(9*7)/(9+7)$*

or, $63/16 = 3.9375 = 4$ (answer)

5. Ram walks 36 km partly at a speed of 4 km/hr and partly at 3 km/hr. If he had walked at a speed of 3km/hr when he had walked at 4 and 4 km/hr when he had walked at 3 he would have walked only

34 km. The time (in hours) spent by Ram in walking was

a) 10

b) 5

c) 12

d) 8

Answer: a) 10

Solution:

Let Ram walk 'x' hrs at 4 km/hr, and 'y' hrs at 3 km/hr.

Given,

$$4x + 3y = 36$$

$$3x + 4y = 34$$

Solving these two equations we get $x + y = 10$

6. Anil works for 8 straight days and rest on the 9th day. If he starts his work on Monday, then on which day he gets his 12th rest day?

a) Thursday

b) Tuesday

c) Wednesday

d) Friday

Answer: c) Wednesday

Solution:

Anil works for 8 days and rests on 9th day. In total 9 days are to be processed 12 times = $12 * 9 = 108$.

*If we calculate according to the week, we get $108 / 7$
 = remaining 3 days. So if Anil starts working on
 Monday, he will rest on third day of the week which
 is Wednesday.*

6. One day Eesha started 30 min late from home and reached her office 50 min late while driving 25% slower than her usual speed. How much time in min does eesha usually take to reach her office from home?

Ans: We know that Speed is inversely proportional to time While she drives 25% slower means she drove at $\frac{3}{4}$ of her usual speed (S). We know that $D = S \times T$ When speed became $\frac{3}{4}$ of her usual speed then Time taken should be $\frac{4}{3}$ of her usual time (T) i.e, She has taken $\frac{4}{3}T - T$ extra to cover the distance. Extra Time = $\frac{4}{3}T - T = \frac{1}{3}T = 20$ min (as 20 min late due to slow driving) Actual time $T = 60$ Minutes

1) J can dig a well in 16 days. P can dig a well in 24 days. J, P, H dig in 8 days. H alone can dig the well in How many days?

a) 32

b) 48

c) 96

d) 24

Assume the total work = 48 units.

Capacity of J = $48 / 16 = 3$ units / day

Capacity of P = $48 / 24 = 2$ units / day

Capacity of J, P, H = $48 / 8 = 6$ units / day

From the above capacity of H = $6 - 2 - 3 = 1$

So H takes $48 / 1$ days = 48 days to dig the well

2) The wages of 24 men and 16 women amounts to Rs.11600 per day. Half the number of men and 37 women earn the same amount per day. What is the daily wage of a man?

Let the wage of a man is m and woman be w .

$$24m + 16w = 11600$$

$$12m + 37w = 11600$$

Solving we get $m = 350$

3) Father is 5 times faster than son. Father completes a work in 40 days before son. If both of

them work together, when will the work get complete?

- a. 8 days
- b. $8 \frac{1}{3}$ days
- c. 10 days
- d. 20 days

Ans: B

As efficiency is inversely proportional to days, If Father : son's efficiency is $5 : 1$, then Days taken by them should be $1 : 5$. Assume, the days taken by them are $k, 5k$.

Given that father takes 40 days less. So $5k - k = 40$
 \Rightarrow

$$k = 10$$

Father takes 10 days to complete the work. Total work is $10 \times 5 = 50$ units.

If both of them work together, they complete $5 + 1$ units a day. $6/\text{day}$. To complete 50 units, they take $50/6 = 8 \frac{1}{3}$ days.

9.SERIES AND PROGRESSIONS

4. A series 1234123441234441234444.....n what is the value on 200th position..??

a.1

b.2

c.3

d.4

Answer:d

1)Series 1, 4, 2, 8, 6, 24, 22, 88 ?

Sol : The given series is in the format: $\times 4, -2, \times 4, -2, \times 4, -2, \times 4, \dots$

$$1 \times 4 = 4$$

$$4 - 2 = 2$$

$$8 - 2 = 6$$

$$6 \times 4 = 24$$

$$24 - 2 = 22$$

$$22 \times 4 = 88$$

$$88 - 2 = 86$$

Ans: 86

2) Find last two digits of the following expression
 $(201 \times 202 \times 203 \times 204 \times 246 \times 247 \times 248 \times 249)^2$

To find the last two digits of a product take the last two digits in each number and multiply.

$01 \times 02 \times 03 \dots 48 \times 49$ (use onscreen calculator)
this gives 76. So $76^2 = 5776$ So last two digits are 76

3) What will be in the next series

1, 7, 8, 49, 56, 57, 343, ...

Ans: 344

$$1 = 1$$

$$7 = 1 \times 7$$

$$8 = 1 \times 7 + 1$$

$$49 = 7 \times 7 + 1$$

$$50 = 7 \times 7 + 1$$

$$56 = 8 \times 7$$

$$57 = 8 \times 7 + 1$$

$$343 = 49 \times 7$$

Next term should be $49 \times 7 + 1 = 344$

10.TIME, SPEED, DISTANCE

1.Joke is faster than Paul, Joke and Paul each walk 24 KM. The sum of their speed is 7 Km per hour. And the sum of times taken by them is 14 hours. Then, Joke speed is

- a. 3 KM/Hr
- b. 4 KM/Hr
- c. 5 KM/Hr
- d.7 KM/Hr

Answer:a

12. When asked what the time is, a person answered that the amount of time left is $\frac{1}{5}$ of the time already completed. What is the time.

1. 8 pm
2. 8 am
3. 12 pm
4. 12 am

Sol: A day has 24 hrs. Assume x hours have passed.
Remaining time is $(24 - x)$
 $24 - x = \frac{1}{5}x \Rightarrow x = 20$ Time is 8 PM

13. Perimeter of the backwheel = 9 feet, front wheel = 7 feet on a certain distance, the front wheel gets 10 revolution more than the back wheel. What is the distance

Let the backwheel make x revolutions then front wheel makes

$$x + 10 \times 9 = (x + 10) \times 7 \quad x = 35 \quad \text{So distance traveled} \\ = 35 \times 9 = 315$$

1. A spherical solid ball of radius 58 mm is to be divided into eight equal parts by cutting it four times longitudinally along the same axis. Find the surface area of each of the final pieces thus obtained (in mm^2)? (where $\pi = \frac{22}{7}$)

- a. 3365π b. 5046π

c. 1682π d. 3346π

Answer: B

2..Two circles of radii 5 cm and 3 cm touch each other at A and also touch a line at B and C. The distance BC in cms is?

a. $\sqrt{60}$

b. $\sqrt{62}$

c. $\sqrt{68}$

d. $\sqrt{64}$

Sol: Option A

1) A and B start from house at 10am. They travel from their house on the MG road at 20kmph and 40 kmph. there is a Junction T on their path. A turns left at T junction at 12:00 noon, B reaches T earlier, and turns right. Both of them continue to travel till 2pm. What is the distance between A and B at 2 pm. Distance between House and T junction = $20 \times 2 = 40$.

ie., B reached T at 11 am.

B continued to right after 11 am and travelled upto

2. So distance covered by him = $3 \times 40 = 120$

A reached T at 12 noon and travelled upto 2 So

distanced travelled by him = $2 \times 20 = 40$

So total distance between them = $120 + 40 = 160$ km

2) At 12.00 hours, J starts to walk from his house at 6 kmph. At 13.30, P follows him from J's house on his bicycle at 8 kmph. When will J be 3 km behind P?

By the time P starts J is $1.5 \text{ hr} \times 6 = 9$ km away from his house.

J is 3 km behind when P is 3 km ahead of him. ie., P has to cover 12 km. So he takes $12 / (8 - 6) = 6$ hrs after 13.30. So the required time is 19.30Hrs

3) J is faster than P. J and P each walk 24 km. Sum of the speeds of J and P is 7 kmph. Sum of time taken by them is 14 hours. Then J speed is equal to

a) 7 kmph

b) 3 kmph

c) 5 kmph

d) 4 kmph

Given $J > P$

$J + P = 7$, only options are (6, 1), (5, 2), (4, 3)

From the given options, If $J = 4$ the $P = 3$. Times taken by them = $24/4 + 24/3 = 14$

4) Car A leaves city C at 5pm and is driven at a speed of 40kmph. 2 hours later another car B leaves city C and is driven in the same direction as car A. In how much time will car B be 9 kms ahead of car A if the speed of car is 60kmph

Relative speed = $60 - 40 = 20$ kmph

Initial gap as car B leaves after 2 hours = $40 \times 2 = 80$ kms

Car B should be 9 km ahead of the A at a required time so it must be 89 km away

Time = $89 / 20 = 4.45$ hrs or 267 mins

5) A and B run a 1 km race. If A gives B a start of 50m, A wins by 14 seconds and if A gives B a start of 22 seconds, B wins by 20 meters. Find the time taken by A to run 1 km.

To solve these type of questions, always keep in your mind that, the ratio of the speeds of two contestants never change.

A gives B a start of 50 m means, A runs 1000 m and B runs only 950. By the time A reaches the target, B has to take 22 seconds to reach the target.

$$a \cdot b = 1000 \cdot 950 - 14b = 9801000 - 22b$$

$$50,000 - 1100b = 46550 - 686b$$

Solving we get $b = 25/3$

Now Assume A's speed = x

$$1000 \cdot 950 - 14(25/3) = x \cdot 25/3$$

$$x = 10$$

So x takes $1000/10 = 100$ seconds.

1 There is a tank whose $1/7$ th part is filled with fuel. If 22 liters of fuel is poured into the tank, the indicator rises to $1/5$ th mark of the tank. So what is the total capacity of the tank?

Answer: 385

Solution:

Let the total capacity of the tank be 'x' liters.

According to the question,

$$\Rightarrow x/7 + 22 = x/5$$

$$\Rightarrow x/5 - x/7 = 22$$

$$\Rightarrow x = 385 \text{ litres (Answer)}$$

2 There is a town called Metron, where wheels of the front and rear of vehicles are of different size. The measurement unit followed in the town is the metre.

The circumference of the front wheel of the car is 133 metres and that of rear wheels is 190 metres. So what is the distance travelled by the cart in metres

when the front wheel has done nine more revolutions than the rear wheel?

- a. 1330
- b. 572
- c. 399
- d. 3990

Answer: d) 3990

Solution:

*At first, we calculate the LCM of 133 and 190 which is 1330. So, the front wheels take 10 rounds to cover 1330 metres and the rear wheels take 7 rounds to cover the same. So to take 9 extra revolutions the vehicle would have travelled $1330 * 3 = 3990$ metres.*

3 30 litres of 78% of a concentrated acid solution is to be prepared. How many litres of 90% concentrated acid needs to be mixed with 75% solution of concentrated acid to get the result?

- a) 10
- b) 6
- c) 3
- d) 4

Answer: b) 6

Solution:

Let's apply the weighted-average formula.

Let there be n_1 litre of 90% acid solution and n_2 litre of 75% solution

Therefore,

$$\Rightarrow 78 = ((90 * n1) + (75 * n2)) / (n1 + n2)$$

We get,

$$\Rightarrow n1/n2 = 1 / 4$$

So 30 litres needed to be divided in the ratio of 1:4,

which gives us 6 litre as the answer.

4 A flight takes off at 2 a.m. from a place at 18N 10E and landed at 36N 70W, 10 hours later. What is the local time of the destination?

- a) 6:00 a.m.
- b) 6:40 a.m.
- c) 7:40 a.m.
- d) 7:00 a.m.
- e) 8:00 a.m.

Answer: b) 6:40 a.m

Solution:

*Let' calculate the difference in the number of latitudes
= $70 + 10 = 80$ degrees towards east.*

*We know 1 degree = 4 min, so 80 degrees = $80 * 4 =$
320 mins*

320 mins = 5 hr 20 minutes

*Now the plane landed 10 hours later so time of
landing = 12 hrs accoding to the starting place*

*So time at destination = $12 \text{ hrs} - 5 \text{ hrs } 20 \text{ min} = 6 \text{ hr}$
40 mins(Answer)*

5 An athletic run at 9 km/hr along a railway track.
The track is 240m long and ahead of a train 120m
long running at 45km/hr, in the same direction.
how much time will the train take to completely
cross the athlete?

a) 3.6 sec

b) 18 sec

c) 72 sec

d) 36 sec

Answer: d) 36 sec

Solution:

Let's try to find the relative speed = $45 - 9 = 36\text{km/hr}$

$$= 36 * 5/18 = 10\text{m/s}$$

Now the total distance needed to be covered by the

train to completely cross the athlete = $240 + 120 =$

360m

So time = dist/speed = $360/10 = 36$ seconds

6 Two vertical walls of the length of 6 meters and 11 meters are at a distance of 12 meters apart. Find the top distance of both walls?

a) 15 meters

b) 13 meters

c) 12 meters

d) 10 meters

Answer: b) 13 meters

Solution:

Let's consider this figure,

We need to find the distance of AB,

We know $AC = 12\text{ m}$ and $BC = 11 - 6 = 5\text{ m}$

So applying pythagoras theorem we get,

$AB = 13\text{ metres}$

7 John is faster than Peter. John and Peter each walk

24 km. Sum of the speeds of John and Peter is 7

km/h. Sum of time taken by them is 14 hours. Find John's speed.

a) 4 km/h

b) 5 km/h

c) 3 km/h

d) 7 km/h

Answer: *a) 4 km/h*

Solution:

We know that John's speed is greater than Peter's speed and the sum of there speed is 7.

So the combinations are = (6, 1), (5, 2), (4, 3)

Now checking from the options if John's speed is equal to 4, then Peter's speed is 3,

or, the time taken by them = $24/4 + 24/3 = 14$ hours.

8 A car starts at 6:00 pm. from the starting point at a speed of 18 m/s, reached its destination. There it waited for 40 minutes and returned back at the speed of 28 m/s. Find the time taken to reach the destination.

a) 9:44 pm

b) 8:32 pm

c) 7:30 pm

d) 9:30 pm

Answer: a) 9:44 pm

Solution:

Let the distance covered be D m

The time to cover the starting distance = $D/18$ secs.

The time taken for the reverse journey = $D/28$ secs.

According to the quesiton,

$$D/18 - D/28 = (40 \times 60)$$

On solving this we get,

$$D = 2400 \times 252/5 = 120960 \text{ m}$$

*No the total time taken = $(D/18) + (D/28) + 2400 =$
 13440 seconds*

= 3 hours and 44 minutes

Therefore, the bus reaches back at 9:44 PM

9 A call centre agent has a list of 305 phone numbers of people in alphabetic order of names, but Anuj does not have any of the names. He needs to quickly contact Danish Mank to convey a message to him. If each call takes 2 minutes to complete, and every call is answered, what is the minimum amount of time during which he can guarantee to deliver the message to Danish?

- a) 206 minutes
- b) 610 minutes
- c) 18 minutes
- d) 34 minutes

Answer: c) 18 minutes

Solution:

We need to search for a particular name in a phone book. So we need to apply a method in which we can easily search a number in a minimum count. So we

divide the list into two equal halves, i.e., $305/2 = 152.5$ or let's take 152. Now we can decide whether to check for Danish in the upper or lower half of 152. This is decided by the starting letter of the name in a page. Proceeding in the similar manner we get,

$$152/2 = 76$$

$$76/2 = 38$$

$$38/2 = 19$$

$$19/2 = 9$$

$$9/2 = 4$$

$$4/2 = 2$$

$$2/2 = 0$$

*So we get 0 at the 9th time, hence this is the minimum number of the count to find Danish. So total time taken = $9 * 2 = 18$ minutes.*

10 A pole of height 36m is on one edge of a road broke at a certain height. It fell in such a way that the top of the pole touches the other edge of the road. If the breadth of the road is 12m, then what is the height at which the pole broke?

- a) 12
- b) 16
- c) 24
- d) 18

Answer: b) 16

Solution:

Let the point at which the pole broke be 'x' from the ground, so the length of the broken piece be (36-x).

So applying Pythagoras theorem we get,

=>

$$\Rightarrow 72x = 1296 - 144$$

$$\Rightarrow x = 16$$

11 An old man takes 30 minutes and a young man takes 20 minutes to walk from apartment to office. If one day the old man started at 10.00 AM and the young man at 10:05 AM from the apartment to office, when will they meet?

a) 10:00

b) 10:15

c) 10.30

d) 10:45

Answer: b) 10:15

Solution:

Let the distance of the apartment from the office be 12 km

So the speed of the old man = $12 / (1/2) \text{ hr} = 24 \text{ km/hr}$

The young man speed = $12 / (1/3) \text{ hr} = 36 \text{ km/hr}$

Since the old man started 5 minutes earlier, he covers $24 \times (5/60) = 2 \text{ km}$ in 5 minutes.

*Now the time taken to the young man to meets him = $2/(36-24) * 60 = 10 \text{ minutes}$*

So the time of meet = $10:05 + 10 = 10 \text{ hr } 15 \text{ min}$ or $10:15$

12 One day, Ramesh started 30 minutes late from home and driving at 25% slower than the usual speed, reached the market 50 minutes late. How

much time in minutes does Ramesh usually take to reach the market from home?

a) 20

b) 40

c) 60

d) 80

Answer: *a) 60*

Solution:

Let the usual speed of Ramesh be 's'

Let the distance between home and market be 'd'

So usual time took = d/s

Time took on that particular day = $d/(3s/4)$

So according to the question,

$$d/s(4/3 - 1) = 20$$

or, $d/s = 60$

13 10 programmers are able to type 10 lines in 10 minutes. How many programmer are required to type 60 lines in 60 minutes?

a) 10

b) 16

c) 60

d) None of the above

Answer: *a) 10*

Solution:

This is a simple question of logical reasoning. If 10 programmers can type 10 lines of code in 10 minutes then to type 60 lines of code, in 60 minutes, the same 10 coders will be required, since the lines of code and time are in proportion

1. A tree of height 36m is on one edge of a road broke at a certain height. It fell in such a way that the top of the tree touches the other edge of the road. If the breadth of the road is 12m, then what is the height at which the tree broke?

a. 16

b. 24

c. 12

d. 18

ans:b

2.X takes 4 days to complete one-third of a job,Y takes 3 days to complete one-sixth of the same work and Z takes 5 days to complete half the job.If all of them work together for 3 days and X and Z quit, how long will it take for Y to complete the remaining work done.

a. 6 days

b. 7 days

c. 5.1 days

d. 8.1 days

Answer: c

3. year old Eesha visited her grandpa. He gave her this riddle.

I started working at 13. I spent $\frac{1}{6}$ of my working life in a factory. I spent $\frac{1}{4}$ of my working life in an office, and I spent $\frac{1}{4}$ of my working life as a school caretaker. For the last 32 years of my working life I've been doing social service. How old am I?

- a. 109
- b. 102
- c. 105
- d. 113

Answer: a

4.. An old man and a young man are working together in an office and staying together in a near by apartment. The old man takes 30 minutes and the young 20 minutes to walk from appartment to office. If one day the old man started at 10.00 AM and the young man at 10:05AM from the apartment to office, when will they meet?

- a. 10:15
- b. 10:30
- c. 10.45
- d. 10:00

Answer:a

5. In the town of Unevenville, it is a tradition to have the size of the front wheels of every cart different from that of the rear wheels. They also have special units to measure cart wheels which is called uneve. The circumference of the front wheel of a cart is 133 uneves and that of the back wheel is 190 uneves.

What is the distance traveled by the cart in uneves, when the front wheel has done nine more revolutions than the rear wheel?

- a. 570
- b. 1330
- c. 3990
- d. 399

Answer: c

6. The five tyres of a car (four road tyres and one spare) were used equally in a journey of 40,000 kms. The number of kms of use of each tyre was

- a. 40000
- b. 10000
- c. 32000
- d. 8000

Answer: c

7. A play school has chocolates which can supply 50 students for 30 days. For the first ten days only 20 students were present. How many more students can be accommodated into the earlier group such that the entire chocolates get consumed in 30 days. Assume each student takes the same number of chocolates.

- a. 45
- b. 60
- c. 55
- d. 70

Answer: a

. How many of the numbers x (x being integer) with $10 \leq x \leq 99$ are 18 more than the sum of their digits?

- a. 9
- b. 12
- c. 18
- d. 10

Answer: d

3. A conical tent is to accommodate 10 persons.

Each person must have 6 sq. meter space to sit and 30 cubic meter of air to breathe. What will be the height of the cone?

- a. 150m
- b. 37.5 m
- c. 15 m
- d. 75 m

11.EQUATIONS

2. There are 100 wine glasses. I offered my servant to 3 paise for every broken glass to be delivered safely and forfeit 9 paise for every glass broken at the end of day. He received Rs.2.40 .how many glass did he break.

- a.20
- b.73
- c.5
- d.8

Answer:c

4. The average mark obtained by 22 candidates in an examination is 45. The average of the first ten is 55 while the last eleven is 40 .The marks obtained by the 11th candidate is ?

- a.1
- b.2
- c.3
- d.0

Answer : d

9. If 43 times of two digit numbers is 34 times of two digit no .and sum of (number and reverse of the number) is 14 then what is the number?

- a.68
- b.66
- c.67
- d.69

Answer:a

12.REASONING

2. In a series of numbers , the next number is formed by adding 1 to the sum of the previous numbers, and the 10th number is 1280. Then what is the first number in the series? (series will be like this x , $x+1$, $(x+(x+1))+1$,.....)

- a. 1
- b. 4
- c. 5
- d. None of these

Answer: Option B

3.Mr. Bean chooses a number and he keeps on doubling the number followed by subtracting one from it, if he chooses 3 as initial number and he repeats the operation for 30 times then what is the final result?

- a. $(2^{30}) + 1$
- b. $(2^{30}) - 2$
- c. $(2^{31}) - 1$
- d. $(2^{31}) - 2$

Ans: a

9.If two three and four cuts are made parallel to different faces of a cube ,then what is the number of identical pieces obtained?

a.27

b.40

c.60

d.55

ANswer:c

1) My flight takes of at 2am from a place at 18N 10E and landed 10 Hrs later at a place with coordinates 36N70W. What is the local time when my plane landed?

a) 12 noon

b) 6: 40 AM

c) 5: 20 PM

d) 6:50 AM

Remember, while moving from east to west countries lag in time. Remember when Test cricket starts in England? 3. 30 in afternoon. Right? ie., We are in after noon means they are in morning.

If the coordinates change from 10 E to 70W, the plane has moved a total of 80 degrees. We know that with each degree time increases by 4 minutes while going from east to west. (How? $24 \times 60 \text{ min} / 360 \text{ degrees}$, So 1 degree = 4 min)

So total time change = $4 \times 80 = 320 \text{ min} = 5 \text{ hrs} + 20$

minutes.

After 10 hours local time is $(2 \text{ am} + 10 - 5.20 \text{ hrs}) = 6.40 \text{ AM}$.

2) A circle has 29 points arranged in a clock wise manner from 0 to 28. A bug moves clockwise on the circle according to following rule. If it is at a point i on the circle, it moves clockwise in 1 sec by $(1 + r)$ places, where r is the remainder (possibly 0) when i is divided by 11. If it starts in 23rd position, at what position will it be after 2012 sec.

Ans: After 1st second, it moves $1 + (23/11)r = 1 + 1 = 2$, So 25th position

After 2nd second, it moves $1 + 25/11 = 1 + 3 = 4$, So 29th position = 0

After 3rd second, it moves $1 + 0/11 = 1 + 0 = 1$, So 1st position

After 4th second, it moves $1 + 1 = 2$ nd position

after 5th, $1 + 2/11 = 3$ So 3rd position

After 6th, $1 + 3/11 = 4$ so 4th position

After 7th, $1 + 4/11 = 5$ so 5th position

After 8th, $1 + 5/11 = 6$ So 6th position

So it is on 1st after every 3 + 5n seconds. So it is on 1st position after 2008 seconds $(3 + 5 \times 401)$ So on 20th after 2012 position.

3) In an office, at various times during the day the boss gives the secretary a letter to type, each time putting the letter on top of the pile in the secretary's inbox. Secretary takes the top letter and types it.

Boss delivers in the order 1, 2, 3, 4, 5 which cannot be the order in which secretary types?

- a) 2, 4, 3, 5, 1
- b) 4, 5, 2, 3, 1
- c) 3, 2, 4, 1, 5
- d) 1, 2, 3, 4, 5

Ans: Option B

13.GEOMETRY

1.A conical tent is to accommodate 10 persons.

Each person must have 6 sq.meter space to sit and 30 cubic meter of air to breathe. What will be the height of the cone?

- a. 150m
- b. 37.5 m
- c. 15 m
- d. 75 m

Answer: c

6.The diagonal of a square is twice the side of equilateral triangle then the ratio of Area of the Triangle to the Area of Square is?

- a. $\sqrt{3}:8$
- b. $\sqrt{3}:4$
- c. $\sqrt{2}:8$
- d. $\sqrt{2}:3$

Answer:a

An oblong piece of ground measures 19m 2.5 dm by 12m5dm.From center of each side of the ground, a

path 2m wide goes across to the center of the opposite side. What is the area of the path?

a) 59.5m^2 b) 54m^2 c) 78.4m^2 d) 34m^2

ans)c.

In triangle PQR, $PQ=6\text{ cm}$, $PR=8\text{ cm}$, and $QR=12\text{ cm}$. Calculate the area of the triangle PQR

a) 23.33cm^2 b) 17.5cm^2 c) 21.33cm^2 d) 28.67cm^2

ans)c.

If the perimeter and the diagonal of a rectangle is 18 cm and $\sqrt{41}\text{ cm}$ respectively. Calculate the area of the rectangular field

a) 25cm^2 b) 29cm^2 c) 18cm^2 d) 20cm^2

ans)d.

Find the area of Rhombus one of whose diagonals measures 8 cm and the other 10 cm .

a) 47cm^2 b) 34cm^2 c) 40cm^2 d) 64cm^2

ans)c.

A rectangular grassy plot is 112 m by 78 m . It has a gravel path 2.5 m wide all around it on the inside. Find the area of the path?

a) 952m^2 b) 925m^2 c) 912m^2 d) 950m^2

ans)b.

What is the radius of the circular plate of thickness 1cm made by melting a sphere of radius 3cm?

a)6 cm b)5 cm c)4 cm d)7 cm

ans)a.

A polygon has 77 diagonals.Determine the number of sides?

a)15 b)12 c)17 d)14

ans)d.

Determine the metal required to make a 21 m long pipe if its inner and outer diameter is 12 m and 10 m respectively

a) 2904m^3 b) 2534m^3 c) 2843m^3
d) 2647m^3

ans)a.

Which of the following graph indicates the graph of $\{(\sin t, \cos t):-\pi/2 \leq t \leq 0\}$ in xy-plane?

☒ A D

☒ B C

C B

D A

ans)c.

A square field of area 31684 m^2 is to be enclosed with the wire placed at height 1 m, 2 m, 3 m, 4 m above the ground. What length of the wire will be required if its length required for each circuit is 5% greater than the perimeter of the field?

A 6456 m

B 27666 m

C 2990.4 m

D 4666.5 m

ans)c.

14.ARRANGEMENTS AND SERIES

1)A, E, F, and G ran a race.

A said "I did not finish 1st /4th

E said "I did not finish 4th"

F said "I finished 1st"

G said "I finished 4th"

If there were no ties and exactly 3 children told the truth, when who finishes 4th?

a) A

b) E

c) F

d) G

Ans: Option D

2) In a G6 summit held at London. A French, a German, an Italian, a British, a Spanish, a Polish diplomat represent their respective countries.

- (i) Polish sits immediately next to British
 - (ii) German sits immediately next to Italian, British or both
 - (iii) French does not sit immediately next to Italian
 - (iv) If Spanish sits immediately next to Polish, Spanish does not sit immediately next to Italian
- Which of the following does not violate the stated conditions?

- a) FPBISG
- b) FGIPBS
- c) FGISPB
- d) FSPBGI
- e) FBGSIP

Ans: Option D

3) Ahmed, Babu, Chitra, David and Eesha each choose a large different number. Ahmed says, "My number is not the largest and not the smallest". Babu says, "My number is not the largest and not the smallest". Chitra says, "My number is the largest". David says, "My number is the smallest". Eesha says, "My number is not the smallest".

Exactly one of the five children is lying. The others are telling the truth. Who has the largest number?

- a) Eesha
- b) David
- c) Chitra
- d) Babu

Ans: A

Largest ->	A	B	C	D	E
A	F	T/F	T/F	T/F	T/F
B	T/F	F	T/F	T/F	T/F
C	F	F	T	F	F
D	T/F	T/F	T/F	F	T/F
E	T/F	T/F	T/F	T/F	T

From the above table, If we assume that A has the largest then A and C both are lying. Similarly if we find the truthfulness of the remaining people, it is clear that E has the largest and C lied. (Only one F in the last column)

9. What will be in the next series 1, 7, 8, 49, 56, 57, 343, ...
a. 324

b.344

c.315

d.564

Answer:b

Question 1

Directions: Study the following information carefully and

answer the questions given below:

A, B, C, D, E, F, G and H are sitting around a circle

facing the centre.

D is second to the left of H, who is third to the left of A.

B is fourth to the right of C,

who is the immediate neighbour of H.

G is not a neighbour of B or C.

F is not a neighbour of B. Questions:

1. In which of the following pairs is the first person sitting

to the immediate right of the second person?

A DG

B BE

- ☐ C HB
- ☐ D GH
- ☐ E None of these

ans)b.

Question 2

Who is third to the left of B?

- ☐ A G
- ☐ B B
- ☐ C C
- ☐ D Data inadequate
- ☐ E None of these

ans)e.

Question 3

What is F's position with respect to G?

- ☐ A Second towards left
- ☐ B Second towards right
- ☐ C Third towards left
- ☐ D Third towards right
- ☐ E None of these

ans)d.

Question 4

Who is sitting between A and B?

- ☐ A E only
- ☐ B H only
- ☐ C Both E and H
- ☐ D Data inadequate
- ☐ E None of these

ans)a.

Question 5

How many of them are sitting between C and B?

- ☐ A Two only
- ☐ B Four only
- ☐ C Two or Four only
- ☐ D Three only
- ☐ E None of these

ans)d.

Question 6

Study the following information carefully and answer the questions

given below.

Representatives from eight different Banks viz.

A, B, C, D, E, F, G and H are sitting around a circular table facing

the centre but not necessarily in the same order.

Each one of them is from a different Bank viz.

UCO Bank, Oriental Bank of Commerce, Bank of Maharashtra, Canara Bank,

Syndicate Bank, Punjab National Bank, Bank of India and Dena Bank.

F sits second to right of the representative from Canara Bank.

Representative from Bank of India is an immediate neighbour of the

representative from Canara Bank.

Two people sit between the representative of Bank of India and B. C and E

are Immediate neighbours of each other.

Neither C nor E is an immediate neighbour of either B or the

representative from Canara Bank.

Representative from Bank of Maharashtra sits second to right of D.

D is neither the representative of Canara Bank nor Bank of India.

G and the representative from UCO Bank are immediate neighbours

of each other.

B is not the representative of UCO Bank.

Only one person sits between C and the representative from

Oriental Bank of Commerce.

H sits third to the left of the representative from Punjab National Bank sits second to the left of the representative from Syndicate Bank.

Four of the following five are alike in a certain way based on

the given arrangement and thus form a group.

Which is the one that does not belong to that group?

A H – UCO Bank

- B** A – Canara Bank
- C** D – Bank of Maharashtra
- D** E – Syndicate Bank

ans)b.

Question 7

Which of the following is true with respect to the given seating arrangement?

- A** B is the representative from Bank of Maharashtra
- B** C sits second to right of H

The representative from Dena Bank sits to the

- C** immediate left of the representative from UCO Bank

The representatives from Bank of Maharashtra

- D** and Syndicate Bank are Immediate neighbours of each other

ans)d.

Question 8

Who amongst the following is exactly between B and the representative

from Bank of India?

- A** A and the representative from UCO Bank

B F and G

C H and the representative from Bank of Maharashtra

D H and G

ans)c.

Question 9

Who amongst the following is the representative from

Oriental Bank of Commerce?

A A

B D

C H

D C

ans)b.

Question 10

Who amongst the following sits second to left of B?

A C

B H

C The representative from Canara Bank

D The representative from Punjab National Bank

ans)d.

1.n Goa beach, there are three small picnic tables. Tables 1 and 2 each seat three people.

Table 3 seats only one person, since two of its seats are broken. Akash, Babu, Chitra, David, Eesha, Farooq, and Govind all sit at seats at these picnic tables. Who sits with whom and at which table are determined by the following constraints:

- a. Chitra does not sit at the same table as Govind.**
- b. Eesha does not sit at the same table as David.**
- c. Farooq does not sit at the same table as Chitra.**
- d. Akash does not sit at the same table as Babu.**
- e. Govind does not sit at the same table as Farooq.**

Which of the following is a list of people who could sit together at table 2?

- a. Govind, Eesha, Akash**
- b. Babu, Farooq, Chitra**

c. Chitra, Govind, David.

d. Farooq, David, Eesha.

Sol: Option A

15.NUMBER SERIES

1. If $f(x) = 2x + 2$ what is the value of $f(f(3))$?

a) 8

b) 64

c) 16

d) 18

Answer: d) 18

Solution;

$$f(f(3)) = 2(f(3)) + 2$$

$$\Rightarrow 2(2(3) + 2) + 2$$

$$\Rightarrow 16 + 2 = 18$$

2. The numbers from 101 to 150 are written as, 101102103104105...146147148149150. What will be the remainder when this total number is divided by 3?

Answer: 2

Solution:

The divisibility rule for 3 is that the sum of all digits of a number should be divisible by 3. Let's calculate the sum of the digits:

There are 50 1's (unit place) = 50

There are 10 1's (tens place) = 10

There are 10 2's (tens place) = 20

There are 10 3's (tens place) = 30

There are 10 4's (tens place) = 40

There is one 5 (tens place) = 5

For each number 1 to 9, there are 5 sets of sum

$$45(1+2+\dots+9) = 225$$

=> So sum of all digits = 380

=> $380 / 3 = 2$ (Answer)

n putting 16, the equation is satisfied, hence the answer.

3. How many prime numbers lie between 3 and 100 (excluding the values) that satisfies the condition:

- $4x + 1$
- $5y - 1$

Answer: 2

Solution:

There are 23 prime numbers between 3 and 100 (excluding the values) of which all are odd.

For $5y - 1$ to be odd, $5y$ must be even

For $5y$ to be even y should be even.

Taking y as 2 we get $5y - 1$ as 9.

*Now looking at all those prime numbers ending at 9 =
9, 19, 29, 39, 59, 79, 89*

*Out of these, the numbers satisfying both the
equations(integer is assumed) are 9, 29 and 89.*

*We cannot consider 9 as it violates the constraint of
number should be greater than 3.*

Therefore answer is 2 (29 and 89)

4. Find the number of perfect squares in the given series 2013, 2020, 2027,, 2300? (Hint $44^2=1936$)

- a) 2
- b) 1
- c) 3
- d) None of the above

Answer: b) 1

Solution:

We can see that the series is in the form of AP with common difference of 7.

So the series is in the form of $2013 + 7d$

The hint is actually a shortcut:

$$44^2 = 1936$$

$$45^2 = 2025$$

$$46^2 = 2116$$

$$47^2 = 2209$$

$$48^2 = 2304$$

Therefore among these numbers, we need to find which of them are in the form of $2013 + 7d$

Only one number 2209 can be written in the form $2013 + 7 \cdot 28$.

Therefore the answer is 1.

5. In the series of $7^1 + 7^2 + 7^3 + 7^4 + \dots + 7^{204} + 7^{205}$, how many numbers are there with the unit place as 3?

Answer: 51

Solution: According to the cyclicity of 7, the unit digit follows the pattern of 7, 9, 3, 1 and this repeats. So in every 4 numbers, we get one 3 in the unit place.

Dividing 205 by 4 we get 51 which is the answer to the following question.

6. Find the number of divisors of 1728(including 1 and the number itself).

Answer: 28

Solution:

There is a direct formula for this:

Number =

where p , q and r are prime numbers. Simply we need to prime factorize the Number.

Then, $(a+1).(b+1).(c+1)$ is the number of divisors.

For 1728 =

Therefore, $(6+1).(3+1) = 28$

7. There is a set of 30 numbers. The average of first 10 numbers is equal to the average of last 20 numbers. What is the sum of last 20 numbers?

- a) Twice the sum of the first ten numbers
- b) Sum of first 10 numbers.
- c) Twice the sum of the last ten numbers
- d) Cannot be determined.

Answer: a) Twice the sum of the first ten numbers

Solution:

Let the sum of the first 10 numbers is equal to 'x'

Let the sum of the last 20 numbers is equal to 'y'

According to the question:

$$x/10 = y/20$$

$$\text{Therefore, } y = 2x$$

3. Given that $0 < a < b < c < d$, which of the following the largest ?

a. $(c+d) / (a+b)$

b. $(a+d) / (b+c)$

c. $(b+c) / (a+d)$

d. $(b+d) / (a+c)$

Sol: A

Explanation: Take $a = 1$, $b = 2$, $c = 3$, $d = 4$. option A is clearly true

3. Cara, a blue whale participated in a weight loss program at the biggest office. At the end of every month, the decrease in weight from original weight was measured and noted as 1, 2, 6, 21, 86, 445, 2676. While Cara made a steadfast effort, the weighing machine showed an erroneous weight once. What was that.

a) 2676 b) 2 c) 445 d) 86

SOL: This is a number series problem nothing to do with the data given. $1 \times 1 + 1 = 2$ $2 \times 2 + 2 = 6$ $6 \times 3 + 3 = 21$ $21 \times 4 + 4 = 88$ and not 86 $88 \times 5 + 5 = 445$ $445 \times 6 + 6 = 2676$

1. A two digit number is 18 less than the square of the sum of its digits. How many such numbers are there? (1) 1 (2) 2 (3) 3 (4) 4

Ans: Option 2 Take $N = 10a + b$. Given that, $(10a + b) + 18 = K^2 = (a + b)^2$ Given number = $K^2 - 18 = (10a + b)$ That means, when we add 18 to the given number it should be a perfect square. So K^2 takes the following values. 1, 4, 9, 16, 25, 36, 49, 64, 81, 100, 121, 1 to 16 are ruled out as if we subtract 18 from them, the resulting number is a single digit number. Now $25 - 18 = 7$ $36 - 18 = 18$ $49 - 18 = 31$

$64 - 18 = 46$ $81 - 18 = 63$ $100 - 18 = 82$ $121 - 18 = 103$ Now 63, 82 satisfies.

2. A two digit number is 18 less than the sum of the squares of its digits. How many such numbers are there? (1) 1 (2) 2 (3) 3 (4) 4

Ans: Option 2 Only 47 and 67 satisfy the condition

3. For real number x , $\text{int}(x)$ denotes integer part of x . $\text{int}(x)$ is the largest integer less than or equal to x . $\text{int}(1,2)=1, \text{int}(-2,4)=-3$. Find the value of $\text{int}(1/2) + \text{int}(1/2 + 100) + \text{int}(1/2 + 2/100) + \dots + \text{int}(1/2 + 99/100)$

Sol: $\text{int}(1/2) = 0$

$\text{int}(1/2 + 100) = 100$

$\text{int}(1/2 + 2/100) = 0$

.....

$\text{int}(1/2 + 50/100) = 1$

$\text{int}(1/2 + 51/100) = 1$

.....

$\text{int}(1/2 + 99/100) = 1$

So $100 + 1 + 1 + \dots 50 \text{ times} = 150$

4. Given a square of length $2m$. Its corners are cut such that to represent a regular octagon. Find the length of side of octagon

Sol:

Let x is the side of the octagon and $x + 2y$ is the side of the square.

In the given

$$\text{octagon, } y^2 + y^2 = x^2 \Rightarrow 2y^2 = x^2 \Rightarrow y = x/\sqrt{2} \quad y^2 + y^2 = x^2 \Rightarrow 2y^2 = x^2 \Rightarrow y = x/\sqrt{2}$$

$$\text{But } x/\sqrt{2} + x/\sqrt{2} = 2x/\sqrt{2} = \sqrt{2}x = 2 \Rightarrow \sqrt{2}x = 2$$

$$\Rightarrow \sqrt{2}x = 2 \Rightarrow x = 2/\sqrt{2} = \sqrt{2}$$

$$\Rightarrow x = \sqrt{2} \quad y = x/\sqrt{2} = 1 \quad x^2 + y^2 = 2 + 1 = 3 \neq 2$$

5. Find the number of ways a batsman can score a double century only in terms of 4's & 6's?

Assume the batsman scored x 4's and y 6's.

$$4x + 6y =$$

$$200 \Rightarrow 2x + 3y = 100 \Rightarrow 2x = 100 - 3y \Rightarrow x = 50 - 1.5y$$

$$\Rightarrow x = 50 - 1.5y$$

As x is an integer, y should be a multiple of 2.

If

$$y = 0, x = 50$$

$$y = 2, x = 47$$

$$y = 4, x = 44$$

...

$$y = 32, x = 2$$

So total ways are $(32-0)/2 + 1 = 17$ (if 0 6's are possible) otherwise 16

1. An exam was conducted and the following was analyzed. 4 men were able to check some exam papers in 8 days working 5 hours regularly. What is the total number of hours taken by 2 men in 20 days to check double the number of exam papers?

Answer: 8 hours

Solution:

Assuming that 1 unit of work is done in 1 hour

Let's calculate the total number of working hours:

$$\Rightarrow 4 * 8 * 5 = 160 \text{ units}$$

Now the work is doubled:

$$\Rightarrow 160 * 2 = 320 \text{ units}$$

Let 'x' be the number of hours taken by 2 men to complete the work in 20 days.

Therefore,

$$\Rightarrow 2 * 20 * x = 320$$

$$\Rightarrow x = 8 \text{ hours (Answer).}$$

2. The numbers from 101 to 150 are written as, 101102103104105...146147148149150. What will be the remainder when this total number is divided by 3?

Answer: 2

Solution:

The divisibility rule for 3 is that the sum of all digits of a number should be divisible by 3. Let's calculate the sum of the digits:

There are 50 1's (unit place) = 50

There are 10 1's (tens place) = 10

There are 10 2's (tens place) = 20

There are 10 3's (tens place) = 30

There are 10 4's (tens place) = 40

There is one 5 (tens place) = 5

For each number 1 to 9, there are 5 sets of sum

$$45(1+2+\dots+9) = 225$$

=> So sum of all digits = 380

$$=> 380 / 3 = 2 \text{ (Answer)}$$

3. If the alphabets are written in the sequence of a, bb, ccc, dddd, eeeee, fffff, What will be the 120th letter?

Answer: O

Solution:

It can be seen that the letters are in AP sequence, So applying the formula we get,

We find that $n = 15$ fits the equation

The 15th letter in the English alphabet = O

So 15th term contains O.

4. There is a tank whose $\frac{1}{7}$ th part is filled with fuel. If 22 liters of fuel is poured into the tank, the indicator rises to $\frac{1}{5}$ th mark of the tank. So what is the total capacity of the tank?

Answer: 385

Solution:

Let the total capacity of the tank be 'x' liters.

According to the question,

$$\Rightarrow x/7 + 22 = x/5$$

$$\Rightarrow x/5 - x/7 = 22$$

$$\Rightarrow x = 385 \text{ litres (Answer)}$$

5. How many prime numbers lie between 3 and 100 (excluding the values) that satisfies the condition:

$$\bullet \quad 4x + 1$$

• $5y - 1$

Answer: 2

Solution:

There are 23 prime numbers between 3 and 100 (excluding the values) of which all are odd.

For $5y - 1$ to be odd, $5y$ must be even

For $5y$ to be even y should be even.

Taking y as 2 we get $5y - 1$ as 9.

Now looking at all those prime numbers ending at 9 = 9, 19, 29, 39, 59, 79, 89

Out of these, the numbers satisfying both the equations(integer is assumed) are 9, 29 and 89.

We cannot consider 9 as it violates the constraint of number should be greater than 3.

Therefore answer is 2 (29 and 89)

6. In the given figure, find the ratio of area of the square to area of the triangle:

a) 3:2

b) 2:3

c) 2:1

d) 1:2

Answer: c) 2:1

Solution:

Let the side of the square be '2' units

Area of the square = = 4 unit

Side of triangle, using Pythagoras Theorem = unit

Height of triangle = 2 units (Using Pythagorean theorem)

*Area of triangle = $1/2 * \text{base} * \text{height}$*

$$\Rightarrow \frac{1}{2} * 2 * 2$$

$$\Rightarrow 2 \text{ units}$$

Therefore the ratio = 4:2

$$\Rightarrow 2:1 \text{ (Answer)}$$

1) Reflex angle for 9:40

2) Find the length of the longest pole that can be placed in an indoor stadium 24m long, 18 m wide and 16 m high

3) The figure below shows a —size 3|| equilateral triangle divided up into 9 —size

1|| equilateral triangles. The figure has 6 upward facing and 3 downward facing

—size 1||equilateral triangles, 3 upward facing and no downward facing —size 2||

triangle. It has a total of 13 equilateral triangles of all sizes.

The following size 6 triangle is divided up in the same way. What is the sum of the

number of up facing size 2 triangles and the number of upward facing size 4

triangles?

(a) 21 (b) 17 (c) 18 (d) 19

4) The figure shows an equilateral triangle of side length 6, which is divided into

unit triangles. A valid path is a path from the triangle in the top row to the adjacent

triangles in our path share a common edge and the path never

travels up (from a lower row to a higher row) or revisits a triangle. An example of

one such path is illustrated below. How many such valid paths are there?

(a) 120 (b) 16 (c) 23 (d) 24

5) A travels at 40 kmph and B travels at 60 kmph. They are travelling towards

each other and start at the same time. By the time they meet, B would have

travelled 120 km more than A. Find the total distance.

(a) 600 km (b) 720 km (c) 400 km (d) 540 km

6) A travels at 40 kmph and B travels at 60 kmph. They are travelling towards

each other and start at the same time. By the time they meet, B would have

travelled 120 km more than A. Find the total distance.

(a) 600 km (b) 720 km (c) 400 km (d) 540 km

7) Two cylinders are covered with papers on the curved surfaces. The top and

bottom regions of the cylinder are left exposed. If the length of the papers just

covers the surface area of the cylinder (after cutting them if

necessary). Then what is the sum of the volumes of the two cylinders in cc? The

height of the 1st cylinder & 2nd cylinder is 10 cms and 12 cms respectively. The

area of paper covering the first cylinder is $10 \text{ cm} \times 8 \text{ cm}$ and the second is $10 \text{ cm} \times$

4 cm . The answers are to be correct for $10 \text{ cm} \times 4 \text{ cm}$. The answers are to be

correct for 2 decimal places.

(a) 61.54 (b) 54.54 (c) 65.43 (d) 47.76

8) A solid wooden toy is in the shape of a right circular cone mounted on a

hemisphere, such that the circular base of the cone rests on the flat circular

area of the hemisphere. The radius of the hemisphere is equal to the radius of

the circular base of the cone. If the radius of the hemisphere is 28.4 cm and the

total height of the toy is 10.2 cm, find the value of the wooden toy (approx to the

nearest integer)

a) 266 cm^3

b) 104 cm^3

c) 102 cm^3

d) 4.27 cm^3

9) The length, breadth and height of a room are in the ratio 3:2:1. If the breadth

and height are halved while the length is doubled, then the total area of the

walls of the room will;

10) Find the length of the longest pole that can be placed in a indoor stadium 24m

long, 18m wide and 16m height?

11) A person standing inside a rectangle form ABCD and measures his distance

from 3 of the corners as $PA=10$, $PB=3$, $PC=6$ what is his distance in meter from the

other corner D ?

a. 7 b. 13 c. $\sqrt{127}$ d. $\sqrt{109}$

12). In the triangle $AB=15$, $AC=39$, $BC=36$. A Lr dropped from B meets the side AC at

D . A circle of radius bd (with center B) is drawn . if the circle cuts AB and BC at P

and Q respectively the $AP : QC$ is equal to ?

a. $1:7:1$ b. $1:15:1$ c. $1:99:1$ d. $1:18:1$

13). What is the highest power of 91 that divides 781 ?

a. 4 b. 3 c. 6 d. 13

14) An ant smarty moves across a staircase taking the shortest distance calculate

the distance it takes to reach the top to b from a given that staircase consists of

2 steps it is also known that the length breadth is 7 cm , 1cm, 1cm respectively

A. $2\sqrt{16}$

B. $\sqrt{65}$

C. $\sqrt{7}$

D. 9

7. There is a fairy island where lives a Knight, a Knave, and a Spy. You go there and meet three people suppose A, B, and C, one of whom is a knight, one a knave, and one a spy. It is known that the knight always tells the truth, the knave always lies, and the spy can either lie or tell the truth.

- *A says: "C is a knave."*
- *B says: "A is a knight."*
- *C says: "I am the spy."*

So who is the knight, who the knave, and who the spy?

Answer: A = Knight, B = Spy, C = Knave

Solution:

Let us say A is the Knight, then he speaks the truth and C is Knave who lied and finally B is Knave, who speaks the truth regarding A. So this condition holds.

Let us say B is the knight. then it contradicts the answer since a knight always speaks the truth and there cannot be two knights.

Same goes with C.

8. Find the number of perfect squares in the given series 2013, 2020, 2027,, 2300? (Hint $44^2=1936$)

- a) 2
- b) 1
- c) 3
- d) None of the above

Answer: b) 1

Solution:

We can see that the series is in the form of AP with common difference of 7.

So the series is in the form of $2013 + 7d$

The hint is actually a shortcut:

$$44^2 = 1936$$

$$45^2 = 2025$$

$$46^2 = 2116$$

$$47^2 = 2209$$

$$48^2 = 2304$$

Therefore among these numbers, we need to find which of them are in the form of $2013 + 7d$

Only one number 2209 can be written in the form $2013 + 7 \cdot 28$.

Therefore the answer is 1.

9. In the series of $7^1 + 7^2 + 7^3 + 7^4 + \dots + 7^{204} + 7^{205}$, how many numbers are there with the unit place as 3?

Answer: 51

Solution: According to the cyclicity of 7, the unit digit follows the pattern of 7, 9, 3, 1 and this repeats. So in every 4 numbers, we get one 3 in the unit place.

Dividing 205 by 4 we get 51 which is the answer to the following question.

10. Find the number of divisors of 1728(including 1 and the number itself).

Answer: 28

Solution:

There is a direct formula for this:

Number =

where p , q and r are prime numbers. Simply we need to prime factorize the Number.

Then, $(a+1).(b+1).(c+1)$ is the number of divisors.

For 1728 =

Therefore, $(6+1).(3+1) = 28$

6. If all the numbers between 11 and 100 are written on a piece of paper. How many times will the number 4 be used?

Sol: We have to consider the number of 4's in two digit numbers. _ _ If we fix 4 in the 10th place, unit place be filled with 10 ways. If we fix 4 in units place, 10th place be filled with 9 ways (0 is not allowed) So total 19 ways.

Alternatively: There are total 9 4's in 14, 24, 34...,94

& total 10 4's in 40,41,42....49

thus, $9+10=19$

9. 1, 2, 2, 3, 3, 3, 4, 4, 4, 4, 1, 1, 2, 2, 2, 2, 3, 3, 3, 3, 3, 4, 4, 4, 4, 4, 4, 4, 4, 4, 1, 1, 1, 2, 2, 2, 2, 2, 2, 3, 3, 3, 3, 3, 3, 3, 3, 3, 3, 4.....

In the above sequence what is the number of the position 2888 of the sequence.

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

Sol: First if we count 1223334444. they are 10 In the next term they are 20

Next they are 30 and so on So Using
 $n(n+1)2 \times 10 \leq 2888$

For $n = 23$ we get LHS as 2760.

Remaining terms 128. Now in the 24th term, we have 24 1's, and next 48 terms are 2's.

So next 72 terms are 3's. The 2888 term will be "3".

10. How many 4-digit numbers contain no.2?

Sol: Total number of four digit numbers =9000 (i.e 1000 to 9999)

We try to find the number of numbers not having digit 2 in them

. Now consider the units place it can be selected in 9 ways (i.e 0,1,3,4,5,6,7,8,9)

Tens place it can be selected in 9 ways (i.e 0,1,3,4,5,6,7,8,9)

Hundreds place it can be selected in 9 ways (i.e 0,1,3,4,5,6,7,8,9)

Thousands place can be selected in 8 ways (i.e 1,3,4,5,6,7,8,9) here '0' cannot be taken

Total number of numbers not having digit 2 in it =
 $9 \times 9 \times 9 \times 8 = 5832$

Total number of numbers having digit 2 in it = $9000 - 5832 = 3168$

1) Ray writes a two digit number. He sees that the number exceeds 4 times the sum of its digits by 3. If the number is increased by 18, the result is the same as the number formed by reversing the digits. Find the number.

- a) 35
- b) 42
- c) 49
- d) 57

Solution: Let the two digit number be xy .

$$4(x + y) + 3 = 10x + y \dots\dots(1)$$

$$10x + y + 18 = 10y + x \dots\dots(2)$$

Solving 1st equation we get $2x - y = 1 \dots\dots(3)$

Solving 2nd equation we get $y - x = 2 \dots\dots(4)$

Solving 3 and 4, we get $x = 3$ and $y = 5$

2) If x^y denotes x raised to the power y , Find last two digits of $(1141^{3843}) + (1961^{4181})$

- a) 02
- b) 82
- c) 42
- d) 22

Remember 1 raised to any power will give 1 as unit digit.

To find the digit in the 10th place, we have to

multiply, 10th digit in the base x unit digit in the power.

So the Last two digits of the given expression = $21 + 61 = 82$

3) M is 30% of Q, Q is 20% of P and N is 50% of P.

What is M / N

ans: Take $P = 100$, then $N = 50$, $Q = 20$, $M = 6$. So $M/N = 3/25$

4) $30^{72} 87$ divided by 11 gives remainder

Ans: Fermat little theorem says, $a^{p-1} \equiv 1 \pmod{p}$

remainder is 1.

ie., 30^{10} or 8^{10} when divided by 11 remainder is 1.

The unit digit of 7287 is 8 (using cyclicity of unit digits) [Click here](#)

So $7287 = 10K + 8$

$30(10K+8) \equiv (30^{10})^K \cdot 30^8 \pmod{11} \equiv 1^K \cdot 30^8 \pmod{11}$

$8^8 \equiv 2^4 \pmod{11} \equiv 16 \pmod{11} \equiv 5$

5) 1234567891011121314151617181920.....424344

what is remainder when divided by 45?

Ans: Let $N =$

1234567891011121314151617181920.....424344

Remainder when N is divided by 5 is 4. So $N = 5K + 4 \dots (1)$

Remainder when N is divided by 9 is Sum of the digits of N divided by 9. We know that $1+2+3+\dots+44 =$

990 Which gives digit sum as 9. So remainder when N is divided by 9 is 0.

So $N = 9L \dots (2)$

Equation (1) and (2) we $9L = 5K + 4$

For $K = 1$ this equation gets satisfied. So least possible number satisfies the condition is 9

So The general format of $N = w(\text{LCM of } (9, 5)) + \text{Least number satisfies the condition.}$

So $N = w.45 + 9$

When N is divided by 45, we get 9 as remainder.

6) The sum of three digits a number is 17. The sum of square of the digits is 109. If we subtract 495 from the number, the number is reversed. Find the number.

Let the number be abc.

Then $a + b + c = 17 \dots (1)$

$a^2 + b^2 + c^2 = 109$

$\dots (2)$

$100a + 10b + c - 495 = 100c + 10b + a \dots (3)$

From 3, we get $a - c = 5$

So the possibilities for (a, c, b) are (6,1,10), (7,2,8), (8,3,6), (9,4,4)

From the above, (8,3,6) satisfies the condition.

7) A calculator has a key for squaring and another key for inverting. So if x is the displayed number, then pressing the square key will replace x by x^2 and pressing the invert key will replace x by $1/x$. If initially the number displayed is 6 and one

alternatively presses the invert and square key 16 times each, then the final number displayed (assuming no roundoff or overflow errors) will be Even number of inverse key has no effect on the number. For example, Initially the given number is 6. Square key makes it 6^2 and invert key makes it 16^2 . Now again square key makes it $(16^2)^2 = 16^4$ and invert key makes it 6^4 . Now observe clearly, after pressing square key 2 times, the power of 6 became 4.

By pressing the square key, the value got increased like 2, 4, 8, Which are in the format of 2^n . So after the 16 pressings the power becomes 2^{16} So the final number will be $6^{2^{16}} = 665536$

8) How many two digit numbers are there which when subtracted from the number formed by reversing it's digits as well as when added to the number formed by reversing its digits, result in a perfect square.

Let the number $xy = 10x + y$

Given that, $10x+y - (10y - x) = 9(x-y)$ is a perfect square

So $x-y$ can be 1, 4, 9. ----- (1)

So given that $10x+y +(10y +x) = 11(x+y)$ is a perfect square.

So $x+y$ be 11. Possible options are (9,2), (8,3),(7,4),(6,5) -----(2)

From the above two conditions only (6,5) satisfies

the condition

Only 1 number 56 satisfies.

9). Find the remainder when $32^{33^{34}}$ is divided by 11

We know that when the divisor is a prime number, Fermat little theorem says, a^{p-1}

when divided by p , remainder is 1

So 32^{10} gives remainder 1.

Now we have to write $32^{33^{34}}$ in this format. So we have to find the remainder 33^{34} when divided by 10. The remainder is nothing but unit digit of the number. [Click here](#) to learn this concept

33^{34} gives unit digit of 9.

So $33^{34} = 10K + 9$

$32^{33^{34}} = 32^{(10K+9)} = (32^{10})^K \cdot 32^9$

Now this expression when divided by 11 leaves a remainder of 329 which in turn is equal to

$(-1)^9 = -1 = 10$

32). Find Remainder $(34^{31^{301}})$ is divided by 9

10) Find the remainder when 6^{50} is divided by 215

Ans: $6^{50} = (6^3)^{16} \cdot 6^2 = 216^{16} \cdot 6^2$

So this expression gives a remainder of 36

11) In the equation $A + B + C + D + E = FG$ where FG is the two digit number whose value is $10F + G$ and letters A, B, C, D, E, F and G each represent different digits. If FG is as large as possible. What is the value of G ?

a) 4

b) 2

c) 1

d) 3

Ans: B

FG is as large as possible and all the 7 numbers should be different.

By trial and Error method,

$9 + 8 + 7 + 6 + 5 = 35$...5 is getting repeated twice.

$9 + 8 + 7 + 6 + 4 = 34$...4 is getting repeated

$9 + 8 + 7 + 5 + 4 = 33$...3 repeats

$9 + 8 + 6 + 5 + 4 = 32$

None of the numbers repeat in the above case and 32 is the maximum number FG can have. The value of G is 2.

12) A farmer has a rose garden. Every day he either plucks 7 or 6 or 24 or 23 roses. The rose plants are intelligent and when the farmer plucks these numbers of roses, the next day 37 or 36 or 9 or 18 new roses bloom in the garden respectively. On Monday, he counts 189 roses in the garden. He plucks the roses as per his plan on consecutive days and the new roses bloom as per intelligence of the plants mentioned above. After some days which of the following can be the number of roses in the garden?

- a) 4
- b) 7
- c) 30
- d) 37

Ans: A

If he plucks 23, then only 18 grows the next day.

This means total roses get decreases by 5. So after n days assume the number of roses got decreased 185 where $n = 37$, then 4 roses left.

13) What is the value of

$$\frac{(44444445 \cdot 88888885 \cdot 44444442 + 444444438)}{44444444^2}$$

a) 88888883

b) 88888884

c) 88888888

d) 44444443

Ans: A

Let $x = 44444444$

$$(x+1) \times (2x-3) \times (x-2) + (x-6)x^2$$

$$(x^2 - x - 2) \times (2x - 3) + (x - 6)x^2$$

$$2x^3 - 2x^2 - 4x - 3x^2 + 3x + 6 + x - 6x^2$$

$$2x^3 - 5x^2 - 2x + 6$$

Substituting the value of x in $2x - 5$, we get 88888883

14) For which of the following “ n ” is the number $2^{74} + 2^{2058} + 2^{2n}$ is a perfect square?

a) 2012

b) 2100

c) 2011

d) 2020

Ans: D

$$2^{74} + 2^{2058} + 2^{2n} = K^2$$

$$2^{74} + 2^{2058} + 2^{2n} = (237)^2 + 22058 + (2n)^2$$

We try to write this expression as $(a+b)^2 = a^2 + 2ab + b^2$

Now $a = 237$

, $2ab = 22058$ and $b = 2n$

Substituting the value of a in $2ab$, we get $b = 2020$

15) Raj writes a number. He sees that the number of two digits exceeds four times the sum of its digit by 3. If the number is increased by 18, the result is the same as the number formed by reversing the digit. Find the number

a) 35

b) 57

c) 42

d) 49

Ans: A

Going by the options, $35 = 8(4) + 3$.

22 A series of story books were published at an interval of seven years. When the seventh book was published the total sum of the publication year was 13524. In which year was the first book published?

a) 1910

b) 1911

c) 2002

d) 1932

Answer: b) 1911

Solution: We get the series of publications as $n, n+7, n+14, n+21, n+28, n+35, n+42$.

$$\text{Sum of publications} = 13524 = \frac{7}{2}[2n + (7-1)*7]$$

(Using the sum of AP formula)

We get, $n = 1911$ (answer)

23 Identify the missing number in the series: 2, 5, __, 19, 37, 75?

a) 16

b) 12

c) 10

d) 9

Answer: d) 9

Solution:

$$2 * 2 + 1 = 5$$

$$5 * 2 - 1 = 9$$

$$9 * 2 + 1 = 19$$

$$19 * 2 - 1 = 37 \text{ and so on}$$

24 In the given series 11, 23, 47, 83, 131, ... What is the next number?

a) 145

b) 178

c) 191

d) 176

Answer: c) 191

Solution:

The given series follows the order of multiple of 12

$$23 - 11 = 12$$

$$47 - 23 = 24$$

$$83 - 47 = 36$$

$$131 - 83 = 48$$

$$x - 131 = 60$$

$$\text{or } x = 191$$

1.1. If $3y + x > 2$ and $x + 2y \leq 3$, What can be said about the value of y ?

A. $y = -1$

B. $y > -1$

C. $y < -1$

D. $y = 1$

Answer: B

2. A certain function f satisfies the equation $f(x) + 2f(6-x) = x$ for all real numbers x . The value of $f(1)$ is

a. 1 b. 2

c. 3 d. Cannot be determined

Answer: C

3. Two consecutive numbers are removed from the progression $1, 2, 3, \dots, n$. The arithmetic mean of the remaining numbers is $26 \frac{1}{4}$. The value of n is

a. 60 b. 81

c. 50 d. Cannot be determined

Answer: C

4. If $f(x) = 2x+2$ what is $f(f(3))$?

- a. 18
- b. 8
- c. 64
- d. 16

Sol: Option A

5. If $f(x) = 7x + 12$, what is $f^{-1}(x)$ (the inverse function)?

- a. $(x-12)/7$
- b. $7x+12$
- c. $1/(7x+12)$
- d. No inverse exists

Sol: Option A

6. What is the maximum value of $x^3y^3 + 3x*y$ when $x+y = 8$?

- a. 4144
- b. 256
- c. 8192
- d. 102

Sol: Option A

7.If $3y + x > 2$ and $x + 2y \leq 3$, What can be said about the value of y ?

A. $y = -1$

B. $y > -1$

C. $y < -1$

D. $y = 1$

Answer: B

8.In base 7, a number is written only using the digits 0, 1, 2,6. The number 135 in base 7 is $1 \times 7^2 + 3 \times 7 + 5 = 75$ in base 10. What is the sum of the base 7 numbers 1234 and 6543 in base 7.

A. 11101

B. 11110

C. 10111

D. 11011

Answer: B

9.A, B, C and D go for a picnic. When A stands on a weighing machine, B also climbs on, and the weight shown was 132 kg. When B stands, C also climbs on, and the machine shows 130 kg. Similarly the

weight of C and D is found as 102 kg and that of B and D is 116 kg. What is D's weight

- A. 58kg
- B. 78 kg
- C. 44 kg
- D. None

Answer : C

1. In particular language if A=0, B=1, C=2,..... ..
, Y=24, Z=25 then what is the value of ONE+ONE
(in the form of alphabets only)

- a. BDAI
- b. ABDI
- c. DABI
- d. CIDA

Answer: a

2. Find the number of perfect squares in the given series 2013, 2020, 2027,....., 2300 (Hint $44^2=1936$)

- a. 1
- b. 2
- c. 3
- d. Can't be determined

Answer: a

3. What is in the 200th position of 1234 12344
123444 1234444....?

Answer: 4

4. 2345 23455 234555 234555..... what was last
2 numbers at

Answer: 5

5. There are equal number of boys and girls in a
class. If 12 girls entered out, twice the boys as girls
remain. What was the total number of students in a
class?Answer: 48

6. a bb ccc dddd eeeeeWhat is the 120th
letter?

7. 11, 23, 47, 83, 131, . What is the next number?

- a. 145
- b. 178
- c. 176

d. 191

ans:d

8. Crusoe hatched from a mysterious egg discovered by Angus, was growing at a fast pace that Angus had to move it from home to the lake. Given the weights of Crusoe in its first weeks of birth as 5, 15, 30, 135, 405, 1215, 3645. Find the odd weight out.

a) 3645

b) 135

c) 30

d) 15

Answer: c

9. How many different integers can be expressed as the sum of three distinct numbers from the set {3, 10, 17, 24, 31, 38, 45, 52}?

option

a) 8

b) 56

c) 16

d) 15

Answer: c

10. A owes B Rs.50. He agrees to pay B over a number of consecutive days starting on a Monday, paying single note of Rs.10 or Rs.20 on each day. In how many different ways can A repay B.

Ans:8

11. What is the value of $77! \cdot (77! - 2 \cdot 54!)^3 / (77! + 54!)^3 + 54! \cdot (2 \cdot 77! - 54!)^3 / (77! + 54!)^3$

- a. $77! - 54!$
- b. $77! + 54!$
- c. $77!^2 - 54!^2$
- d. $77!$

Answer: a

12. The sum of the four consecutive two digit odd numbers, when divided by 10, becomes a perfect square. Which of the following can be one of these four numbers?

- a. 31
- b. 25
- c. 41
- d. 67

Answer: c

13. What is the number of ways of expressing 3600 as a product of three ordered positive integers (abc, bca etc. are counted as distinct). For example, the number 12 can be expressed as a product of three ordered positive integers in 18 different ways.

- a. 441
- b. 540
- c. 84
- d. 2100

Answer: b

14. There is a 7-digit telephone number with all different digits. If the digit at extreme right and extreme left are 5 and 6 respectively, find how many such telephone numbers are possible?

- a. 120
- b. 30240
- c. None of these
- d. 6720

15. In this question A^B means A raised to the power of B Start with the integers from 1 to 10^{2012} . Replace each of them by the sum of its digits to get a string of 10^{2012} numbers. Keep

doing this until you get 10^{2012} single digit numbers. Let m be the number of 1's and n be the number of 2's. Then $m - n$

a. 1

b. 3

c. 2

d. 0

16. What is the greatest power of 143 which can divide $125!$ exactly

a. 12

b. 11

c. 8

d. 9

17. All even numbers from 2 to 98 inclusive, except those ending 0, are multiplied together. What is the rightmost digit (the units digit) of the product?

a. 6

b. 2

c. 0

d. 4

18. Professor nitwit obtains a hash number of a given positive integer > 3 as follows. He subtracts 2 from the number (to get the new number), and multiplies the new number by 2 to get a term. He repeats this with the new number (to get newer numbers and terms) until the number becomes 2 or 1. The hash is defined as the sum of all the numbers generated in the process.

For example, with the number 5, he multiplies $(5-2 = 3)$ by 2 to get the first term 6. He multiplies $(3 - 2 = 1)$ by 2 to get the second term 2. As the number has become 1, he stops. The hash is the sum of the two numbers $(6+2) = 8$.

If Professor Nitwit is given 3 numbers 19, 7, 15, what is the sum of the hash numbers he obtains for the three numbers?

- a. 297
- b. 273
- c. 290
- d. 278

Answer: d

19. Overfishing is a serious environmental issue. It has been determined by the scientists that if the net of a trawler has mesh size x cm (a square mesh), then the percentage of fish entering the net that are

caught in the net is $(100 - 0.04x^2 - 0.24x)$. For example, if the mesh size is zero, 100% of the fish that enter the net will be caught. A trawler with net with a square mesh, that was suspect of using an illegal size net, dropped its net to the ocean floor near the Andamans and the coast guard, officials arrested the crew. The scientists later looked the size of the fish caught, and estimated that for the net used by the trawler, atleast 97.8% of the fish entering the net would be caught. What is the maximum value of x for the net used by the trawler?

- a. 5
- b. 4.5
- c. 7
- d. None of the above answer

Answer: a

16.TIME AND DISTANCE

1) There are 720 boxes G and M can fill 20 boxes in one hour M and H can fill 24 boxes in one hour H and G can fill 15 boxes in one hour how much time it takes to fill 720 boxes by all the three people?

2) A passenger train takes 5 hrs less for a journey of 360 km. If its speed is increased by 50 kmph from its normal speed. The normal speed is ?

a. 60 b. 50 c. 40 d. none of the above

3) George can do some work in x hrs. Paul can do the same work in 12 hrs. Henry can do it in y hrs. All 3 of them start working at 9AM. While George stops working at 11am and the remaining 2 complete the work. Approximately at what time will the work be complete?

4) Bablo alone can do a work in 10 days. Asha alone can do it in 15 days.

The total wages for the work is 5000. What is Bablo's wage?

5) Find the length of the longest pole that can be placed in an indoor stadium 24 m long, 18 m wide and 16 m high

6) A sum is sufficient to pay either George wage for 15 days or Marks wage for 10

days. How long will it suffice if both work together?

(a) 9 (b) 5 (c) 6 (d) 8

7) Figure shows an equilateral triangle of side of length 5 which is divided into several unit triangles. A valid path is a path from the triangle in the top row to the middle triangle in the bottom row such that the adjacent triangles in our path share a common edge and the path never travels up (from a lower row to a higher row) or revisits a triangle. An example is given below. How many such valid paths are there?

a) 120 b) 16 c) 23 d) 24

1) A bus leaves Mumbai at 3 pm. It travels for 1.5 hours at 60km/hr and then halts for 30 minutes. It then travels at an average speed of 50km/hr for the remaining duration to reach Pune at 6pm. What is the distance between Mumbai and Pune?

a) 100 b) 110 c) 120 d) 140 e) 150

ans) d.

Ajay, Ramya, Suresh and Mary are at one end of a bridge.

It is pitch dark and they have only one torch light.

They need to get to the other side and have to carry the torch.

Ajay can cover the distance in 1 minute, Suresh in 2 minutes,

Ramya in 5 minutes?

a)17 minutes b)20 minutes c)18 minutes d)24 minutes e)21 minutes

ans)a.

Two cars start from A and B and travel towards each other at

the speed of 50 kmph and 60 kmph respectively. At the time of

their meeting, the second car has travelled 120 km more than

the first, the distance between A and B is?

a)600 km b)1320 km c)720 km d)3120 km

ans)b.

Rani and Shakil run a race of 2000 in First. Rani gives Shakil

a start of 200 m and beats him by 1-minute next Rani gives

Shakil a start of 6 min and is beaten by 1000 metres.

Find the time in minutes in which Rani and Shakil can run the

race separately?

a)8,10 b)10,12 c)12,18 d)10,18

ans)a.

A and B start from their house at 10am. They travel from their

house on MG road at 20Kmph and 40kmph These is a T junction

on their path. A turns left at the T junction at 12:00 noon B

reaches the T junction earlier and turns right. Both of them

continue travelling till 2:00 pm What is the distance between

A and B at 2:00 pm?

a)150 km b)120 km c)160 km d)140 km

ans)c.

Raj drives slowly along the perimeter of a rectangular park at

24 kmph and completes one full round in 4 minutes. If the ratio

of the Length to the breadth of the park is 3:2. what are its

dimensions?

a)480 X 320 b)150 X 100 c)100 X 100 d)450 X 300

ans)a.

Two workers one young one old live together and work at same

office it takes 20 minutes for the young to walk to office old

man takes 30 minutes for the same distance when will the young

catch up with old man if the old man starts at 10:05 am?

a)10:10 b)10:15 c)10:25 d)10:20

ans)b.

AJ travels a part of his journey by taxi paying Rs15 per km and

the rest by train paying Rs21 per km if he travels total 450km

and pays Rs8130 the distance travelled by rail is?

a)180 KMS b)260 KMS c)190 KMS d)230KMS

ans)d.

Two cars start from a & b and travel towards each other at

speeds of 59 kmph and 60 kmph respectively at the time of

their meeting the second car has travelled 120km more than

the first the distance between a & b in kms is?

a)720 b)1230 c)1320 d)600

ans)c.

Jake and Paul each walk 10 km. The speed of Jack is 1.5

faster than Paul's speed. Jack reaches the destination 1.5hrs

before Paul. Then Jack's speed is equal to?

A 4

B 6

C 8

D 2

ans)a.

AP,HP,GP

1,2,2,3,3,3,4,4,4,4,1,1,2,2,2,2,3,3,3,3,3,3,4,4,4,4,4,4,4,4,.....

Then what is the 2320 position of the number in the sequence?

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

ans)b.

There are 60 pebbles and 2 persons a and b. A takes 1 pebble,

b takes 2 pebbles and again a takes 3 pebbles and b takes 4 pebbles

and this goes on alternatively. Who takes the maximum number of pebbles?

a)A b)B c)Equal Pebbles d)Cannot be determined

ans)c.

The letters in the word are permuted in all possible ways

and arranged in alphabetical order.find the word in the 44th rank?

a)AERDIO b)AEDROI c)AERDOI d)AERODI

ans)c.

A series 1234123441234441234444.....n what is the value on

200th position..??

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

ans)d.

The sum of 2nd and 19th term of A.P. is equal to the sum of 8th,

15th and 12th term .find the term which is 0?

a)16 b)14 c)12 d)11

ans)b.

The sum of a series of numbers upto n terms is $1/n$.

Find the sum of all the numbers upto 2014

a) $1/2013! \cdot 2014!$ b) $1/2013! \cdot 2013!$ C)2013! d)2014!

Ans)a.

1,5,6 ,25, 26,30,31,
125,126,130,131,150,151,155,156,.....

What is the value of 33rd term in the

a)3473 b)2794 c)3126 d)3326

ans)c.

Two flashlights, of red and yellow colour respectively, flash

at respective intervals of 9 seconds and 33 seconds, 24 seconds.

In an interval of 250 seconds, what is the maximum possible

difference in the number of times that the red and yellow

lights flash?

a)25 b)22 c)18 d)20

ans)d.

The price of a commodity(in rupees per kilogram) is $100 + 0.1n$,

on the n th day of 2007 ($n = 1, 2, \dots, 100$), and then remains constant.

On the other hand, the price of another commodity (in rupees per

kilogram) is $89 + 0.15n$, on the n th day of 2007 ($n=1,2, \dots, 365$).

On which date in 2007, will the price of these two commodities be equal?

a)may21 b)april 11 c)may 20 d)april 10

ans)c.

Consider the sequence $1, -2, 3, -4, 5, -6, \dots$, what is the

average of the first 2000 terms of the sequence?

a)-1 b)-1/2 c)-1/4 d)-1/8

ans)b.

what is the next three numbers for the given series?

11 23 47 83 131

A 136

B 191

C 171

D 278

ans)b.

17.ENCODING DECODING

3. Letters of alphabets are from 1 to 26 are consecutively with 1 assigned to A and 26 to Z. By 27th letter we mean A, 28th B. In general $26m+n$, m and n negative integers is same as the letters numbered n . Let $P = 6$, strange country military general sends this secret message according to the following codification scheme. In codifying a sentence, the 1st time a letter occurs it is replaced by the p th letter from it. 2nd time if occurred it is replaced by P^2 letter from it. 3rd time it occurred it is replaced by P^3 letter from it. What is the code word for ABBATIAL a) GHNNZOOR b) GHKJZOHR c) GHHGZOG R d) GHLKZOIR

Ans: D A should be coded as $1+6 = G$ (it occurred for first time) B should be coded as $2+6 = H$ (it occurred for first time) B Should be coded as $2 + 36 = 38 - 26 = 12 = L$ (it occurred for second time) Option D is correct

2. In the simple subtraction problem below some single digits are replaced by letters. Find the value of $7A+5D+6CD$? $A5C5 - 1B87 \text{ ----- } 674D$

Sol: $15 - 7 = 8$ So $D = 8$ $10 + (C - 1) - 8 = 4$ So $C = 3$
 $10 + (5-1) - B = 7$ So $B = 7$ $(A-1) - 1 = 6$ So $A = 8$ $7A + 5D + 6CD = 56 + 40 + 144 = 240$

1) The simple subtraction problem Below, sum single digits (not necessarily distinct) are replaced by letters, find the value of $7*A + 7*B + 6*C*D$

A 7 C

2 - 4 B

6

a) 77 b) 95 c) 84 d) 70

$$6) 30L + 3Q = 1167$$

$$30L + 6Q = 1284$$

Find L.

- (a) 30 (b) 35 (c) 40 (d) 45

7) In this question AB means A raised to the power B. If $f(x)$

$$= ax^4 - bx^2 + x + 5$$

$$F(-3) = 2$$

Then $f(3) = ?$

- (a) 3 (b) -2 (c) 8 (d) 1

8) In the sample subtraction problem below, single digits are

replaced by letters. Find the value of $2 * A + 4 * B + 7 * C *$

$$D = ?$$

$$A \ 6 \ C \ 2$$

$$- \ 3 \ B \ 5 \ 4$$

4 9 3 D

(a) 280 (b) 295 (c) 260 (d) 396

9) In subtraction problem below, some single digits (not necessarily distinct) are

replaced by letters. Find the value of $3 * A + 5 * B + 4 * C * D$

A 4 C 2

– 3 B 4 8

2 7 0 D

(a) 95 (b) 133 (c) 124 (d) 150

10) $((m!)^2) + 23$ is a perfect square, how many values can m take ?

A. 0

B. 15

C. 1

D. infinity

12) $(75-a)(75-b)(75-c)(75-d)(75-e) = 2299$ find the value of $a+b+c+d=?$

if a, b, c, d and e are distinct integers

A. 330

B. 300

C. 390

D. 530

13) If $f(x) = ax^4 - bx^2 - x + 3$ and $f(3) = -2$, find $f(-3) = ?$

A. 2

B. 4

C. 6

D. 8

15). $100 < n < 200$; $(n^2 - n + 2)$ is divisible by 8 and $(n^2 + 2n - 3)$ is divisible by 27. How

many values can \underline{n} take?

a) Infinitely many

b) 141

c) 40

d) 30

16) $((m!)^2 + 23)$ is a perfect square, how many values can m take ?

a) 0

b) 15

c) 1

d) Infinity

10. In how many different ways can the letters of the word "LEADING" be arranged in such a way that the vowels always come together.

a. 360 b. 720 c. 480 d. 5040

Given letters are A, E, I, D, L, N, G Of which AEI are vowels. Let us combine them into a single letter x.

Now total letters are x, D, L, N, G

These letter are arranged in $5!$ ways. But 3 vowels can arrange themselves in $3!$ ways. So total ways $5! \times 3! = 720$

10. What is the 32nd word of "WAITING" in a dictionary?

Sol: Arranging the words of waiting in Alphabetical Order : A,G,I,I,N,T,W

Start with A _ _ _ _ _ This can be arranged in $6!/2!$ ways $=720/2=360$ ways so can't be arranged starting with A alone as it is asking for 32nd word so it is out of range AG _ _ _ _ then the remaining letters can be arranged in $5!/2!$ ways so, $120/2=60$ ways. Out of range as it has to be within 32 words. AGI _ _ _ Now the remaining letters can be arranged in $4!$ ways $=24$ AGN _ _ _ can be arranged in $4!/2!$ ways or 12 ways so, $24+12=36$ th word so out of range. So we should not consider all the words start with AGN now AGNI _ _ _ can be arranged in $3!$ ways $=6$ ways so $24+6=30$ within range Now only two word left so, arrange in alphabetical order.

AGNTIIW - 31st word

AGNTIWI - 32nd word

3. If the alphabets are written in the sequence of a, bb, ccc, dddd, eeeee, fffff, What will be the 120th letter?

Answer: O

Solution:

It can be seen that the letter are in AP sequence, So applying the formula we get,

We find that $n = 15$ fits the equation

The 15th letter in the English alphabet = O

So 15th term contains O.

18.Reasoning

Question 1

On this island, there are three types of people.

Knights, who always tell the truth, knaves, who always lie,

and spies, who can do either.

In these puzzles, you meet three people, one knight, one knave

and one spy.

The challenge is to determine who is who.

A says "I am a Knight"

B says "A is a Knight"

C says "If you asked me, I would say that A is the spy"

who is a??

A Spy

B Knave

C Knight

D Cant be detemined

ans)a.

1)There is a set of 9 numbers that relate to each other in a certain way. Find the way the first set of boxes works.

The numbers in the second set work in exactly the same way.

Find the number that must

20	6	22
5	8	12
75	42	102
12	15	3
6		12
54	81	45

a) 16 b) 9 c) 12 d) -21

2) In the following keuken puzzle, each cell is to be filled with a digit between 1

and 4. On each row and column, each digit (between 1 and 4) appears exactly

once. Groups of heavily outlined adjacent cells are called cages. Clues are

present in the top left corner of each cage in the form of result and

optionally) a

result using the specified
mathematical operator is
—+|| or —*||. If no
mathematical

operator is specified in a
cage, the number at the
top left corner of the cage
is

the value to be filled in
the cage(the..... x

1

-2x

2

-3x

3

a) -22

b) -27

c) -29

d) -8

3) In the triangle $AB=15, AC=39$. A perpendicular dropped from B meets the side

AC at D. A circle of radius BD (with centre B) is drawn.. If the circle cuts AB &

BC at P and Q respectively. Then AP : QC is equal to

a) 1 : 17.1

b) 1 : 15.1

c) 1 : 19.1

d) 1 : 18.1

Question 2

In 2003, there are 28 days in February and there are 365 days in the year.

In 2004, there are 29 days in February and there are 366 days in the year.

If the date March 11, 2003 is a Tuesday,
then which one of the following would be the date
March 11, 2004 be?

- ☐ A Wednesday
- ☐ B Tuesday
- ☐ C Thursday
- ☐ D Monday

ans)c.

Question 3

If two three and four cuts are made parallel to
different faces of a cube,
then what is the number of identical pieces
obtained?

- ☐ A 27
- ☐ B 40
- ☐ C 60
- ☐ D 55

ans)c.

11. There is a plane contains 32 points.all the 32
points have equal distance from point x. which of the
following is true .

a. all 32 points lie in circle b. the distance from x to all 32 points is less than the distance between each other c. both a and b d. none of these

Sol: Option 3

X must be the center of the circle and 32 points are on the circumference. So Option A is correct Number of diagonals of a regular polygon = $\frac{n(n-3)}{2}$ So for a polygon of 32 sides, Number of diagonals = 464. Now the minimum distance between any two points = $2\pi r/32 = 1156r/32$ Now total length of all the distances from 32 points = $2\pi r/2 +$ Sum of the lengths of all the 464 diagonals. Sum of the lengths of x to all the 32 points = 32 radius = 32r But the 464 diagonals have 16 diameters connecting 2 opposite points connecting via center. So Sum of the lengths of distances from point to point is clearly greater than sum of the length from x to all 32 points. Option B is correct Correct Option 3

1. The figure shown can be folded into the shape of a cube. In the resulting cube, which of the lettered faces is opposite the face marked x?

- a. c
- b. a
- c. d
- d. b

Ans: a

Explanation: If you fold the above picture at the dotted lines, X and C are opposite to each other.

19.DIVISIBILITY

25 If a number is divided by 357 the remainder is 5, what will be the remainder if the number is divided by 17?

- a) 9
- b) 3
- c) 7
- d) 5

Answer: d) 5

Solution:

Let the number be N when divided by 357 leaves remainder 5 and quotient q .

$$\text{So, } N = 357k + 5 = 17 * 21 * k + 5$$

So, 357 is exactly divisible by 17 so remainder is 5

1..What is the largest integer that divides all three numbers 23400,272304,205248 without leaving a remainder?

- a. 48
- b. 24
- c. 96
- d. 72

Sol: Option B

4)A number divided by 5,3,2 leaves remainder 0,3,1.
If the same number divided by 2,3,5 leaves remainder?

2.What is the largest number that will divide 90207, 232585 and 127986 without leaving a remainder?

- a. 257
- b. 905
- c. 351

d. 498

Sol: Option A

3. How many divisors (including 1, but excluding 1000) are there for the number 1000?

a. 15

b. 16

c. 31

d. 10

Sol: Option A

26 The numbers 272738 and 232342, when divided by n , a two digit number, leave a remainder of 13 and 17 respectively. Find the sum of the digits of n ?

a) 5

b) 4

c) 7

d) 8

Answer: c) 7

Solution:

So according to the question, $(272738 - 13)$ and $(232342 - 17)$ are exactly divisible by n .

So if we find the HCF of these two numbers, we get n ,

The HCF of 272725 and 232325 is 25

So the sum of the digits = 7.

27 Crusoe hatched from a mysterious egg discovered by Angus was growing at a fast pace that Angus had to move it from home to the lake. Given the weights of Crusoe in its first weeks of birth as 5, 15, 30, 135, 405, 1215, 3645. Find the odd weight out.

- a) 3645
- b) 135
- c) 15
- d) 30

Answer: d) 30

Solution:

Looking at the series closely we find that the 3rd number is oddly placed.

The series is in the form:

$$5 * 3 = 15$$

$$15 * 3 = 45$$

$$45 * 3 = 135$$

$$135 * 3 = 405 \text{ and so on}$$

28 Assume that $f(1)=0$ and $f(m+n)=f(m)+f(n)+4(9mn-1)$. For all natural numbers (Integers >0) m and n . What is the value of $f(17)$?

a) 5436

b) 4831

c) 5508

d) 4832

Answer: d) 4832

Solution:

We need to use $f(1)$ to calculate the value of $f(17)$

$f(17)$ can be written as $f(1+16)$

$f(16)$ can be written as $f(8+8)$

$f(8)$ can be written as $f(4+4)$

$f(4)$ can be written as $f(2+2)$

$f(2)$ can be written as $f(1+1)$

*$f(1) = 0$, so $f(2) = f(1+1) = f(1)+f(1)+4(9*1*1-1) = 32$.*

*or, $f(4) = f(2+2) = f(2)+f(2)+4(9\times 2\times 2 - 1) = 32+32+4\times 35$
 $= 204$.*

$$\text{or, } f(8) = f(4+4) = f(4)+f(4)+4(9 \times 4 \times 4 - 1) = \\ 204+204+4 \times 143 = 980$$

$$\text{or, } f(16) = f(8+8) = f(8)+f(8)+4(9 \times 8 \times 8 - 1) = \\ 980+980+4 \times 575 = 4260$$

$$\text{or, } f(17) = f(1+16) = f(16)+f(1)+4(9 \times 16 \times 1 - 1) = \\ 4260+0+ 4 \times 143 = 4832$$

29 Find the greatest power of 143 which can divide $125!$ exactly.

a) 11

b) 8

c) 9

d) 7

Answer: c) 9

Solution:

We can write $143 = 11 \times 13$.

*So the highest power of 13 should be considered in $125!$, which is 9 ($13 * 9 = 117$)*

*The highest power of 11 in $125!$ is 12 ($11 * 11 = 121$ and remaining 1).*

That means, $125! = 11^{12} \times 13^9 \times \dots$

So only nine 13's are available. So we can form only nine 143's in $125!$. So maximum power of 143 is 9.

30 The value of a house depreciates each year, by $\frac{3}{4}$ of its initial value at the beginning of the year. If the initial value of the scooter is Rs. 40, 000. What will be the value at the end of 3 yrs?

a) Rs. 19000

b) Rs. 16875

c) Rs. 17525

d) Rs. 18000

Answer: b) 16875

Solution:

This is the question of succession depreciation.

the starting amount = Rs. 40000

This reduces by $3/4$ th of its initial value every year =

$$(40,000) * (3/4)^3 = 16875$$

9 What is the remainder when the number
101102103104105106107...148149150 is divided
by 9?

Answer: 2

Solution:

*The divisibility rule for 9 is that the sum of all digits of
a number should be divisible by 9. Let's calculate the
sum of the digits:*

There are 50 1's (unit place) = 50

There are 10 1's (tens place) = 10

There are 10 2's (tens place) = 20

There are 10 3's (tens place) = 30

There are 10 4's (tens place) = 40

There is one 5 (tens place) = 5

For each number 1 to 9, there are 5 sets of sum

$$45(1+2+\dots+9) = 225$$

=> So sum of all digits = 380

=> $380 / 9 = 2$ (Answer)

10 If $f(x) = ax^4 - bx^2 + x + 5$ and given $f(-3) = 2$, then $f(3) = ?$ ($a^b = a$ raised to power b)

a) 3

b) 8

c) 1

d) -2

Answer: b) 8

Solution:

We can directly solve:

$$\Rightarrow f(-3) = a(-3)^4 - b(-3)^2 + (-3) + 5 = 2$$

$$\Rightarrow 81a - 9b - 2 = 2$$

$$\Rightarrow 81a - 9b = 0$$

Now solving $f(3)$,

$$\Rightarrow f(3) = 81a - 9b + 8$$

$$\Rightarrow f(3) = 0 + 8 = 8(\text{Answer})$$

11 Given, $\log(0.318) = 0.3364$ and $\log(0.317) = 0.3332$, find $\log(0.319)$?

a) 0.3396

b) 0.3394

c) 0.3393

d) 0..390

Answer: a) 0.3396

Solution:

$$\Rightarrow \log(0.319) = \log(0.318) + (\log(0.318) - \log(0.317))$$

$$= 0.3364 + (0.3364 - 0.3332)$$

$$= 0.3364 + 0.3332$$

$$= 0.3396 \text{ (Answer)}$$

12 .Which of the following numbers must be added to 5678 to give a reminder 35 when divided by 460?

a) 980

b) 618

c) 955

d) 797

Answer: d) 797

Solution:

Let the number added to 5678 be x to give a remainder 35 and quotient k when divided by 460.

$$\text{So, } 5678 + x = 460k + 35$$

$$\text{or, } 5643 + x = 460k$$

So $5643 + x$ must be divisible by 460

Ananyising from the options, we get on adding 797 to 5643, the number 6440 is divisible by 460.

10). What is the remainder of $(32^{31^{301}})$ when it is divided by 9?

13. What is the remainder when the number 101102103104105106107...148149150 is divided by 9?

Answer: 2

Solution:

The divisibility rule for 9 is that the sum of all digits of a number should be divisible by 9. Let's calculate the sum of the digits:

There are 50 1's (unit place) = 50

There are 10 1's (tens place) = 10

There are 10 2's (tens place) = 20

There are 10 3's (tens place) = 30

There are 10 4's (tens place) = 40

There is one 5 (tens place) = 5

For each number 1 to 9, there are 5 sets of sum

$$45(1+2+\dots+9) = 225$$

=> So sum of all digits = 380

=> $380 / 9 = 2$ (Answer)

14 If $f(x) = ax^4 - bx^2 + x + 5$ and given $f(-3) = 2$, then $f(3) = ?$ ($a^b = a$ raised to power b)

a) 3

b) 8

c) 1

d) -2

Answer: b) 8

Solution:

We can directly solve:

$$\Rightarrow f(-3) = a(-3)^4 - b(-3)^2 + (-3) + 5 = 2$$

$$\Rightarrow 81a - 9b - 2 = 2$$

$$\Rightarrow 81a - 9b = 0$$

Now solving $f(3)$,

$$\Rightarrow f(3) = 81a - 9b + 8$$

$$\Rightarrow f(3) = 0 + 8 = 8(\text{Answer})$$

15. Given, $\log(0.318) = 0.3364$ and $\log(0.317) = 0.3332$, find $\log(0.319)$?

a) 0.3396

b) 0.3394

c) 0.3393

d) 0.3390

Answer: a) 0.3396

Solution:

$$\Rightarrow \log(0.319) = \log(0.318) + (\log(0.318) - \log(0.317))$$

$$= 0.3364 + (0.3364 - 0.3332)$$

$$= 0.3364 + 0.3332$$

$$= 0.3396 \text{ (Answer)}$$

16 .Which of the following numbers must be added to 5678 to give a remainder 35 when divided by 460?

a) 980

b) 618

c) 955

d) 797

Answer: d) 797

Solution:

Let the number added to 5678 be x to give a

remainder 35 and quotient k when divided by 460.

$$\text{So, } 5678 + x = 460k + 35$$

$$\text{or, } 5643 + x = 460k$$

So $5643 + x$ must be divisible by 460

Ananysing from the options, we get on adding 797 to 5643, the number 6440 is divisible by 460.

7. A number when successively divided by 5, 3, 2 gives remainder 0, 2, 1 respectively in that order. What will be the remainder when the same number is divided successively by 2, 3, 5 in that order

- a) 4, 3, 2
- b) 1, 0, 4
- c) 2, 1, 3
- d) 4, 1, 2

Ans: B

use this simple technique. $[(1 \times 3) + 2] = 5$
 $[(5 \times 5) + 0] = 25$

Procedure:

Let the number = N

Now $N = 5K$

$K = 3L + 2$

$L = 2M + 1$

$K = 3(2M + 1) + 2 = 6M + 5$

$N = 5(6M + 5) = 30M + 25$

For $M = 0$ we get the least number as 25. Now when 25 is divided by 2, we get 12 as quotient and 1 as remainder. When 12 is divided by 3 we get 4 as quotient, and 0 as remainder. When 4 is divided by 5 we get 4 as remainder.

24) Find the greatest number that will divide 148, 246 and 623 leaving remainders

4, 6 and 11 respectively

A. 20

B. 12

C. 6

D. 48

10. Star question: If $f(1)=4$ and $f(x+y)=f(x)+f(y)+7xy+4$, then $f(2)+f(5)=?$

Sol: Let $x = 1$ and $y = 1$ $f(1 + 1) = f(1) + f(1) + 7 \times 1 \times 1 + 4 \Rightarrow f(2) = 19$ Let $x = 2$ and $y = 2$ $f(2 + 2) = 19 + 19 + 7 \times 2 \times 2 + 4 \Rightarrow f(4) = 70$ Let $x = 1$ and $y = 4$ $f(1 + 4) = 4 + 70 + 28 + 4 = 106$ $f(2) + f(5) = 125$

1.If $5+3+2=151022$, $9+2+4=183652$, then $7+2+5=?$

Ans: 143547 If the given number is $a + b + c$ then $a.b \mid a.c \mid a.b + a.c - b \Rightarrow 5+3+2 = 5.3 \mid 5.2 \mid 5.3 + 5.2 - 3 = 151022 \Rightarrow 9+2+4 = 9.2 \mid 9.4 \mid 9.2 + 9.4 - 2 = 183652$ $7+2+5 = 7.2 \mid 7.5 \mid 7.2 + 7.5 - 2 = 143547$

11)Star Question - The finance department of ABC consultants process the seven weekly invoices (1 to 7) payable to seven vendors which will be paid by Thursday of the same week as per these rules:

Ans 3,4,5,7

12)The sum of 55 consecutive integers $a_1, a_2, a_3, a_4, \dots, a_{55}$ is 2750. What is the sum of their squares?

2. 4 men can check exam papers in 8 days working 5 hours regularly. What is the total hours when 2 men will check the double of the papers in 20 days?

Sol. Let a man can do 1 unit of work in 1 hour. Total units of work = $4 \times 8 \times 5 = 160$ units. Now work = $2 \times 160 = 320$ units. Now 2 men work for 20 days. Let in x hours they have to work per day. Now total work = $2 \times x \times 20 = 40x$ So $x = 320/40 = 8$ hours.

3. $X =$

101102103104105106107.....146147148149150
(From numbers 101-150). Find out the remainder when this number is divided by 9.

Sol: The divisibility rule for 9 is sum of the digits is to be divisible by 9.

So We calculate separately, sum of the digits in hundreds place, tenths place, and units place. Sum of the digits in hundreds place: $1 \times 50 = 50$

Sum of the digits in tenths place : $0 \times 9 + 1 \times 10 + 2 \times 10 + 3 \times 10 + 4 \times 10 + 5 \times 1 = 105$

Sum of the digits in units place : $(1 + 2 + 3 + \dots + 9) \times 5 = 225$

So total = 380

So remainder = $380 / 9 = 2$

6. $7^1 + 7^2 + 7^3 + \dots + 7^{205}$. Find out how many numbers present which unit place contain 3?

Sol. Units digits of first 4 terms are 7, 9, 3, 1. and this pattern repeats. So for every 4 terms we get one term with 3 in its unit digit. So there are total of $205/4 = 51$ sets and each set contains one terms with 3 in its unit

9. The sum of two numbers is 45. Sum of their quotient and reciprocal is 2.05, Find the product of the numbers.

Sol: Let a, b be the numbers. $a + b = 45$ $\frac{a}{b} + \frac{b}{a} = 2.05$

$$\Rightarrow \frac{a^2 + b^2}{ab} = 2.05$$

$$\Rightarrow \frac{a^2 + b^2}{ab} = 2.05$$

$$\Rightarrow \frac{(a+b)^2 - 2ab}{ab} = 2.05$$

$$\Rightarrow \frac{(a+b)^2 - 2ab}{ab} = 2.05$$

$$\Rightarrow \frac{(a+b)^2}{ab} - 2 = 2.05 \Rightarrow \frac{(a+b)^2}{ab} = 4.05 \Rightarrow \frac{45^2}{ab} = 4.05 \Rightarrow ab = \frac{45^2}{4.05} = 500$$

10. A number is divided by 406 leaves remainder 115, What will be the remainder when it will be divided by 29?

Sol. Let the number be N . So $N = 406x + 115$.

Now divide this number by 29. As 406 is exactly divisible by 29, we have to divide 115 by 29 and find the remainder. So remainder = 28 digit. Ans is 51.

$$11. (p/q - q/p) = 21/10.$$

Then find $4p/q + 4q/p$?

sol. Let $p/q = a$, then $(a - 1/a) = 21/10$

$$\Rightarrow a^2 - 1 = a \cdot 21/10$$

$$\Rightarrow a^2 - 1 = a \cdot 21/10$$

$$\Rightarrow 10a^2 - 21a - 10$$

$$\Rightarrow 10a^2 - 21a - 10 = 0$$

Roots of the equation = $\frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$

$$a = \frac{21 \pm \sqrt{441 + 400}}{20} \quad a = \frac{21 \pm 29}{20}$$

$$= \frac{5}{2} \text{ or } -\frac{2}{5} \text{ For } a = \frac{5}{2},$$

$$4p/q + 4q/p = 58/5 \text{ For } a = -2/5, 4p/q + 4q/p = -58/5$$

18. When $a + b$ is divided by 12 the remainder is 8, and when $a - b$ is divided by 12 the remainder is 6. If $a > b$, what is the remainder when ab divided by 6?

a) 3

b) 1

c) 5

d) 4

Answer: b) 1

Solution:

According to the question,

$$a + b = 12k + 8$$

=>

$$a - b = 12l + 6$$

=>

Subtracting both the equations we get,

$$ab =$$

Now all the terms of ab is divisible by 6, except 7. So the remainder left is 1.

13) The remainder when $m+n$ is divided by 12 is 8 and the remainder when $m-n$ is divided by 12 is 6. If $m > n$ then what is the remainder when mn is divided by 6.

14) Write numbers from sequence 149 to 387 like 149150159.....? How many

times does 1 occur?

19 All even numbers from 2 to 98 inclusive the both, are to be multiplied together. What is the unit digit of the product?

a) 2

b) 0

c) 6

d) 4

Answer: c) 6

Solution:

Let us look at the sequence of the multiplications,

$$2 * 4 * 6 * 8 * 12 * 14 * 16 * 18 * \dots * 98$$

If we look closely we will find that the units place of every number forms a sequence of 2, 4, 6 and 8 multiplying to a number whose units place is always 4 and in all we get 10 4's. So the unit digit of final number = $4^{10} = 6$.

20 Let a number 'x' when divided by 406 leaves a remainder 115. What will be the number when the number is divided by 29?

Answer: 28

Solution:

According to the question, the number is equal to $406x + 115$.

Since 406 is divisible completely by 29, therefore any multiple of 406 that is $406x$ when divided by 29 leaves remainder 0. Now 115, when divided by 29, leaves remainder 2

5) Write numbers from sequence 149 to 387 like 14950.....387 . How many times does 1 occur in the series?

6) Consider the sequence of numbers 6,4,0,4,... where for $n > 2$ the n th term of the sequence is the units digit of the sum of the previous two terms. Let S_n denote the sum of the first n terms of this sequence. What is the smallest value of n for which $S_n > 2273$

A 576 B 571 C 570 D 569

7)How many positive integers less than 500 can be formed using the numbers 1,2,3, and 5 for digits, each digit being used only once.

1.A 57

2.B 34

3.C 45

4.D 62

8)Which of the following numbers must be added to 5678 to give a remainder 35 when divided by 460?

A 980 B 950 C 618 D 797

2)A number when divided by 50 leaves remainder 16? What is that no?

27) The number when divided by 50 leaves a remainder 43. The same number when divided by 320 leaves a remainder n . How many values can n take ?

- a) 64
- b) 6
- c) 10
- d) 32

21 In the given series: 70, 54, 45, 41..... What will be the next number?

- a) 40
- b) 36
- c) 35
- d) 38

Answer: a) 40

Solution:*The series goes like:*

$$70 - 54 = 16 (4^2)$$

$$54 - 45 = 9 (3^2)$$

$$45 - 41 = 4 (2^2)$$

$$41 - 40 = 1 (1^1)$$

20.Mensurations

1) There is a set of 36 distinct points on a plane with the following characteristics:

* There is a subset A consisting of fourteen collinear points.

* Any subset of three or more collinear points from the 36 are a subset of A. How many distinct triangles with positive area can be formed with each of

its vertices being one of the 36 points? (Two triangles are said to be distinct if at least one of the vertices is different)

A 9083 B 4495 C 8215 D 9139

2) Jain housing complex has a democratically elected governing council comprising of the president, secretary and the treasurer. During their annual meeting, they take up 3 different initiatives for discussion and voting, namely, painting of exteriors, 24 hour security, and additional water tank. They vote as below

- Each member of the council votes for at least one of the initiatives and against at least of the initiatives

- Exactly two members of the **council** votes for the painting initiatives

- Exactly one member of the council vote for the security initiatives

- Exactly one member of the council vote for the water tank initiatives

- The president votes for the painting initiative and votes against security initiative

- Security votes against painting initiative

- Treasurer votes against water tank initiative Which one of the following statement could be true?

A. President and Secretary vote the same way on the water tank initiative B. Secretary and Treasurer vote the same way on the painting initiative C. Secretary and Treasurer vote the same way on the Security initiative

D. President votes for one of the initiatives and Secretary votes for two of the initiatives)

3) President, Secretary, Treasurer is there. Painter, water, security each should

atleast suppose one and atleast oppose one.

President

oppose

4) In a certain city, 60 percent of the registered voters are PARTY B supporters

and the rest are PARTY A supporters. In an assembly election, if 75 percent of the

registered PARTY B supporters and 20 percent of the registered PARTY A

supporters are expected to vote for Candidate A, what percent of the registered

voters are expected to vote for Candidate A?

(a) 53 (b) 20 (c) 60 (d) 75

5) Three sisters are identical triplets. The oldest by minutes is Asha, and Asha

always tells anyone the truth. The next oldest is Eesha, and Eesha always will tell

anyone a lie. Usha is the youngest of the three. She sometimes lies and sometimes

tells the truth. Victor, an old friend of the family's came over one day and as usual

he didn't know who was who, as he asked each of them one question. Victor asked

the sister that was sitting on the left, —Which sister is in the middle of you three?‖

and the answer he

received was, —Oh, that's Asha‖. Victor then asked the sister in the middle, —What is

your name?‖ The response given was, —I'm Usha.‖ Victor turned to the sister on the

right, then asked, —Who is that in the middle?‖ The sister then replied, —She is

Eesha‖. This confused Victor; he had asked the same question three times and

received three different answers. Who was actually sitting in the middle?

(a) Asha (b) Eesha (c) Usha (d) Cannot be determined

6) University of vikramasila has enrolled nine PhD candidate babu, chitra, dheeraj,

eesha, farooq, gowri, hameed, iqbal, jacob

- farooq and iqbal were enrolled on the same day as each other and no one

else was enrolled that day

- chitra and gowri were enrolled on the same day as each other and no one

else was enrolled that day

- on each of the other days of hiring , exactly one candidate was enrolled
- eesha was enrolled before babu
- hameed was enrolls before deeraj
- deeraj was enrolled after iqbal but befoe eesha
- gowri was enrolled after both Jacob and bau
- babu was enrolled before Jacob
- who were the last two candidates to be enrolled?

A. gowri and chitra

B. babu and chitra

C. babu and gowri

D. eesha and Jacob

7) on door A – it leads to freedom

on door B – it leads to Ghost house

on door C – it leads to ghost house

the statement written on one of the doors is wrong

identify which door leads to freedom

A. A

B. B

C. C

D. none

8) Air conditioned bus from siruseri industry park runs of regular intervals

throughout the day. It is now 3:09pm and the last bus arrived 1 min late ago

but it was 2 min

9) Two women usha and has. If first women worked above. She would need eight

hours more to complete the design than if they both worked together. Now if has

worked alone, it would need 4.5 hours move to complete the design than they both

working together. What time would it take haas done to complete the design.

10) There is a set of 36 distinct points on a plane with the following characters

There is a subset of A consisting of 14 collinear points

Any subset of 3 or more collinear points from the are a subset of A

How many distinct D will positive area can be formed with each other of its

vertices being one of the 36 points? (the triangle are said to be distinct if at least

one of vertices is different.

a)7140 b) 47774 c)1540 d)6776

11) In a potato race, 20 potatoes are placed in a line of intervals of 4 meters with

first potato 24 meters from the starting point. A Contestant is required to bring

potatoes back to the starting place one at a time.
How far would he run in bringing

back all the potatoes.

a) 2400 b) 1440 c) 2480 d) 1240

12) X takes to 4 days to complete $\frac{1}{3}$ of job. Y takes
3 days to complete $\frac{1}{6}$ th of

the same work & Z takes 5 days to complete the half
of the job. If all them work

together for 3 days, X and Z quit. How long will it
takes for Y to complete the

remaining work alone?

a) 8.6 days b) 5.1 days c) 4.5 days d) 7.5 days

13) A sum of Rs.20706 is distributed amongst A, B,
C. A gets $\frac{10}{123}$ of what B & C

got together and C gets $\frac{1}{10}$ of what A&B got
together. C's share is (approx)?

a) 1782.3 b) 1885.0 c) 1882.4 d) 1456.8

14) $abc = 9000$, (a,b) (b,c) (c,a) are pairs of co prime numbers. Find $a+b+c=?$

a) 142 b) 1009 c) 119 d) none of this

$$2^3 \cdot 5^3 \cdot 3^3 = 8 \cdot 125 \cdot 9$$

$$=(8,125) \quad 125+17 = 142$$

Ans:

142

15) There are 3 cities A, B & C. Two ways to reach C from A or B shortest distance

from A to B is 66km. shortest distance from B to C is 45 km. shortest distance A to

C is 50 km. There is another city called P. Shortest distance, from P to A is 180 km.

shortest distance from P to B is 200 km. Find the shortest distance between P to C.

a)23

0 b)

245

c)

291

d)

430

16) Three persons sail in a ship which got drowned near an island and they are

struck there one of them is knight who speaks only truth ,one is a spy who

speaks either a truth or a lie and other one is the knave who speaks only lies

from the following statements made by 3 people A, B and c comprising the

knight, knave, and spy though not necessarily in that order identify the spy

A→I am knight

B→A is not knave

C→if you had asked me, I would say A is the spy

A. A

B. B

C. C

D. cannot be determined

12. Two vertical ladders length of 6 m and 11 m are kept vertically at a distance of 12 m. Find the top distance of both ladders?

Sol:

So distance between the top points = AD
 $= \sqrt{12^2 + 5^2} = 13$

So in paper B he did well.

1) If the area of a square region having sides of length 6 cms is equal to the area of a rectangular region having width 2.5 cms, then the length of the rectangle, in cms, is

Ans: Given Area of the square = Area of rectangle
 $\Rightarrow a^2 = 1 \cdot b$

Substituting the above values in the formula

$$\Rightarrow 6^2 = 1 \cdot 2.5$$

$$\Rightarrow l = 14.4 \text{ cm}$$

2) Raj drives slowly along the perimeter of a rectangular park at 24 kmph and completes one full round in 4 min. If the ratio of length to breadth of the park is 3 : 2, what are the dimensions?

- a) 450 m x 300 m
- b) 150 m x 100 m
- c) 480 m x 320 m
- d) 100 m x 100 m

24 kmph = $24 \times 1000 / 60 = 400$ m / min

In 4 minutes he covered $4 \times 400 = 1600$ m

This is equal to the perimeter $2(l + b) = 1600$

But $l : b = 3 : 2$

Let $l = 3k$, $b = 2k$

Substituting, we get $2(3k + 2k) = 1600 \Rightarrow k = 180$

So dimensions are 480×320

1. In the polynomial $f(x) = 2x^4 - 49x^2 + 54$, what is the product of the roots, and what is the sum of the roots (Note that x^n denotes the x raised to the power n , or x multiplied by itself n times)?

- a. 27,0
- b. 54,2
- c. $49/2$,54
- d. 49,27

Sol: Option A

28) Highest power of 91 that divides 78 ?

- a) 4
- b) 3
- c) 6
- d) 73

29) $2481 = (\pm 1 \pm 2 \pm 3 \dots \pm n)$. What is the minimum value of n ?

a) 65

b) 69

c) 70

d) 71

30) Write the number from 149 to 387 in a sequence like

149,150,151,152,153.....386,387. How many 10 times the digit 1 occurs in the

sequence.

31) 1,2,3 and 4 can form 256 difference 4 digit numbers. If digit repeated two of

them are 1111 and 1113. The find the sum of 256 numbers

1.711040 b)711000 c)711038 d) 711042

2..In the polynomial $f(x) = x^5 + a*x^3 + b*x^4 + c*x + d$, all coefficients a, b, c, d are integers. If $3 + \sqrt{7}$ is a root, which of the following must be also a root?(Note that x^n denotes the x raised to the

power n , or x multiplied by itself n times. Also $\text{sqrt}(u)$ denotes the square root of u , or the number which when multiplied by itself, gives the number u)?

- a. $3 - \text{sqrt}(7)$
- b. $3 + \text{sqrt}(21)$
- c. 5
- d. $\text{sqrt}(7) + \text{sqrt}(3)$

Sol: Option A

3) In a 3×3 grid, comprising 9 tiles can be painted in red or blue. When tile is rotated by 180 degrees, there is no difference which can be spotted. How many such possibilities are there?

- a. 16
- b. 32
- c. 64
- d. 256

Ans: B

This grid even rotated 180 degrees the relative positions of the tiles do not change. So we paint tile number 1's with red or blue (only one color should be used) , 2's with red or blue.....tile 5 red or blue. Then total possibilities are 25

$$= 32$$

4. A shopkeeper charges 12 rupees for a bunch of cakes. Anuj bargained to the shopkeeper and got two extra ones, and that made them cost one rupee for dozen less than first asking price. How many cakes did Anuj receive in 12 rupees?

a) 10

b) 14

c) 18

d) 16

Answer: d) 16

Solution:

Let the number of cakes = 'x' or 'x/12' dozen

So, $x/12$ cost Anuj 12 rupees, or 1 dozen cost him =

$144/x$ rupees

Now, he gets two extra = $144/(x+2)$ in 1 rupees less,

$$\Rightarrow 144/x - 144/(x+2) = 1$$

\Rightarrow

6. Mr Mehta chooses a number and keeps on doubling the number followed by subtracting one from it. If he chooses 3 as the initial number and he repeats the operation 30 times then what is the final result?

a) $(2^{30}) - 1$

b) $(2^{30}) - 2$

c) $(2^{31}) - 1$

d) None of these

Answer: d) None of these

Solution:

According to the question,

$$3 * 2 - 1 = 5 =$$

$$5 * 2 - 1 = 9 =$$

$$9 * 2 - 1 = 17 =$$

Proceeding in the similar fashion, on 30 times we get

2) In this question A^B means A raised to the power B. If $f(x) = ax^4 - bx^2 + x + 5$

and $f(-3) = 2$,

then $f(3)$

- a. 1
- b. -2
- c. 3
- d. 8

7. 8. 9. 10. A white cube (with six faces) is to be painted blue on two different faces. In how many different ways can this be achieved (two paintings are considered same if on a suitable rotation of the cube one painting can be carried to the other)?

a) 30 ways

b) 18 ways

c) 4 ways

d) 2 ways

Answer: d) 2

Solution:

This can be achieved in the following different ways;:

First, painting on opposite faces can be achieved in 1 way.

Second, painting on adjacent faces can be achieved in 1 way.

Therefore in 2 ways.

MCQ 5

1. 2. Rahaman went to a stationery shop and bought 18 pencils for Rs.100. He paid 1 rupee more for each grey pencil than for each black pencil. What is the price of a grey pencil and how many grey pencils did he buy?

a) Rs.5, 10

b) Rs.6, 10

c) Rs.5, 8

d) Rs.6, 8

Answer: b) Rs. 6, 10

Solution:

The best way is to analyse from the mentions.

Let's take option b in which 10 pencils are bought at

*Rs.6 each. So total cost of grey pencils = $6 * 10 =$*

Rs.60. So Rahaman is left with 40 rupees. He buys 8 black pencils at Rs 5 each which is 1 rupee less than what he had spent in buying the grey ones. Thus satisfying the conditions.

3. 4. Ram said Shyam “If you give me half your money I will have Rs.75.” Shyam said, “If you give me one-third of your money, I will have Rs.75 How much money did Shyam have4

c) 48

d) 60

Answer: d) 60

Solution: *Let Ram and Shyam be denoted by ‘R’ and ‘S’ respectively*

According to the question,

$$\text{Eqn 1. } R + S/2 = 75$$

$$\text{Eqn 2. } R/3 + S = 75$$

*Therefore, solving both the equations we get, $R = 45$
and $S = 60$.*

5. Ram goes to the market to buy apples. If he can bargain and reduce the price per apple by Rs.2, he can buy 30 apples instead of 20 apples with the money he has. How much money does he have?

- a. Rs.100
- b. Rs.50
- c. Rs.120
- d. Rs.150

Answer: c) 120

Solution: *Let the price per orange be Rs. x .*

So total money Ram has in buying at original price = $20x$.

*On reducing the price by 2 rupees each the total money must be $(x-2)*30$*

According to the question,

$$20x = (x-2)*30$$

On solving this we get $x = 6$ or the total money = Rs.

120

6. 7. A boy entered a shop and bought x number of books for y rupees. When he was about to leave the bookkeeper said, “if you buy 10 more books, you can have all the books for 2 rupees and you will also save 80 cents a dozen”. So what are x and y ?

- a) (5, 1)
- b) (10, 1)
- c) (15, 1)
- d) Cannot be determined.

Answer: a) (5, 1)

Solution:

x number of books cost him y rupees.

So, 1 book will cost him y/x rupees.

12 books will cost him rupees $12 y/x$.

The shopkeeper says,

$x + 10$ books cost him 12 rupees

1 book will cost him $12/(x+10)$ rupees

12 books will cost him $24/(x+10)$ rupees

We know that 80 cents = $4/5$ of a dollar,

So, $12y/x - 24/(10+x) = 4/5$

Analysing the given choices, we get (5, 1) satisfies the equation.

8. The perimeter of an equilateral triangle is equal to a regular hexagon. Find out the ratio of their areas?

- a. 3:2
- b. 1:6
- c. 2:3
- d. 6:1

Answer: c) 2:3

Solution: Let the side of the equilateral triangle be a unit and that of the regular hexagon be b unit.

So perimeter of the triangle = $3a$ and perimeter of the hexagon is $6b$ unit.

$$\text{or, } 3a = 6b$$

$$\text{or } a/b = 2/1$$

The area of the equilateral triangle =

The area of the regular hexagon =

or, :

Solving this and substituting a/b we get the answer as 2 : 3

9. MCQ 6

1.

3. 9. There is a rectangular ground 17×8 m surrounded by a 1.5 m width path. The depth of the path is 12 cm. Sand is filled and find the quantity of sand required.

a) 5.5

b) 10.08

c) 6.05

d) 7.05

Answer: b) 10.08

Solution:

*Area of the inner rectangle = $17 * 8 = 136$ meter-square*

*Area of the outer rectangle = $(17 + 2*1.5) * (8 + 2*1.5)$
= 220 meter-square*

So area of the remaining path = $220 - 136 = 84$ meter-square

*So sand required to fill the path = $84 * (12/100) =$
 10.08 meter-square*

1. The sticks of the same length are used to form a triangle as shown below. If 87 such sticks are used then how many triangles can be formed?

- a) 42
- b) 43
- c) 44
- d) 45

Answer: b) 43

Solution:

As we can see the first triangle can be formed using 3 sticks. So we have $87 - 3 = 84$ sticks left.

So every next triangle can be formed using 2 sticks.

So we have $84/2 = 42$ triangles and 43 triangles in all.

2. Find the next number in the series of 3, 12, 7, 26, 15, ?

a) 54

b) 55

c) 64

d) 74

Answer: a) 54

Solution:

$$3 * 2 + 1 = 7$$

$$12 * 2 + 2 = 26$$

$$7 * 2 + 1 = 15$$

$$26 * 2 + 2 = 54$$

1. 2. A rectangle is divided into four rectangles with area 70, 36, 20, and x. What is the value of 'x'?

a) 350/7

b) 350/11

c) 350/9

d) 350/13

Answer: c) 350/9

Solution:

Since the areas of the rectangles are in proportion we can say,

$$\Rightarrow 70/x = 36/20$$

$$\Rightarrow x = 350/9$$

3.4. 5. Salim bought a certain number of oranges at a rate of 27 oranges for rupees 2 times M, where M is an integer. He divided these oranges into two equal halves, one part of which he sold at the rate of 13 oranges for Rs M and the other at the rate of 14 oranges for Rs M. He spent and received an integral no of rupees, but bought the least number of oranges. How many did he buy?

a) 980

b) 9828

c) 1880

d) 102660

Answer: b) 9828

Solution:

Let Salim buy $2x$ number of oranges.

So he buys 27 oranges at a price of $2M$.

He buys 1 orange at a price of $2M/27$

or, x oranges cost him Rs. $2Mx/27$

*Now he sells x oranges at the rate of 13 oranges for
Rs. M*

So he sells 1 orange at Rs. $M/13$

and x oranges at Rs $Mx/13$

Same goes for 14 oranges which are $Mx/14$,

*According to the question, $2Mx/27$, $Mx/13$, $Mx/14$
are integers*

So, x oranges must be divisible by 27, 13 and 14

The lcm of 27, 13 and 14 = 4914 or $2x = 9828$

7. There are 12 letters and exactly 12 envelopes.

There is one letter to be inserted randomly into each envelope. What is the probability that exactly 1 letter is inserted in an improper envelope?

a) 1

b) 0

c) $10!$

d) None of these

Answer: b) 0

Solution:

This is a question of very common sense in which, 12 letters are to be inserted in 12 envelopes, 1 in each, so if one letter is inserted into a wrong envelope there has to be another letter which is to be inserted into another wrong envelope. So the probability of this is 0.

8. A hollow space on the earth surface is to be filled. The total cost of filling is Rs. 20000. The cost of filling per cubic-meter is Rs 225. How many times is a size of 3 cubic-meter soil required to fill the hollow space?

a) 29.62

b) 30.32

c) 88.88

d) 43.64

Answer: a) 29.62

Solution:

The total cost of filling = 20, 000

Cost of filling 1 cubic meter = Rs. 225

*So cubic meters to be filled = $20,000/225 = 88.89$
meter-cube*

*Now we need to find the three times of 88.89 to be
filled = $88.89/3 = 29.63$*

So the closest match is 29.62

*9. A 7-digit number is to be formed with all different
digits. If the digits at the extreme right and extreme
left are fixed to 5 and 6 respectively, find how many
such numbers can be formed?*

a) 120

b) 30240

c) 6720

d) None of these

Answer: c) 6720

Solution:

If the digits at extreme left and right are fixed as 5 and 6, then the number of digits left = 8

*So the in-between 5 places can be filled in $8 * 7 * 6 *$*

*$5 * 4$ ways*

= 6720 ways

21) What is the sum of the all 5 digit number using 1, 2, 3, 7, 9 without repeating

any of them?

A. 5688860

B. 5677708

C. 5866680

D. 5866608

26)What is the sum of all 4 digit number using 2,3,7,9 without repeating any of them ?

10. There are five tires in a sedan (four road tires and one spare) which is to be used equally in a journey to travel 40, 000 km. The number of km of use of each tyre was

1. a) 32000

2. b) 8000

3. c) 4000

4. d) 10000

5. **Answer:** a) 32000

6. **Solution:**

7. *The total km travelled by the sedan = 40, 000 km*

8. *Since every tire capacity's = $40,000/5 = 8000$*

km each

9. *So total distance covered by each tire = $8000*4 =$*

32000 km each will be travelled by each tire after

being worn out after every 8000 km.

21. Profit and loss

1) A dealer originally bought 100 identical batteries at a total cost of q rupees. If each battery was sold at 50 percent above the original cost per battery, then, in terms of q , for how many rupees was each battery sold?

Ans: Per battery cost = $q / 100$

If each battery is sold for 50% gain, then selling price = $\text{Cost Price} \times (100 + \text{Gain} 100)$
 $\Rightarrow q100 \times (100 + 50 100) = 3q200$

2) A cow and horse are bought for Rs. 2,00,000. The cow is sold at a profit of 20% and the horse is sold at a loss of 10%. The overall gain is Rs. 4000, the Cost price of cow?

- a) 130000
- b) 80000
- c) 70000
- d) 120000

Ans: Overall profit = $4000 200000 \times 100 = 2\%$

By applying alligation rule, we get

So cost price of the cow = $2/5 \times 200000 = 80,000$

3) A man sold 12 candies in \$10 had loss of b% then again sold 12 candies at \$12 had profit of b% find the value of b.

Ans: Here 12 candies is immaterial.

Loss % = $\frac{\text{CP} - \text{SP}}{\text{CP}} \times 100$

So Here SP = 10 and loss% = b%

$\frac{\text{CP} - 10}{\text{CP}} \times 100 = b \Rightarrow \text{CP} - 10 = \frac{b}{100} \text{CP}$

In the second case he got a profit of b%

So Profit % = $\frac{\text{SP} - \text{CP}}{\text{CP}} \times 100$

So Here SP = 12 and profit% = b%

$\frac{12 - \text{CP}}{\text{CP}} \times 100 = b \Rightarrow 12 - \text{CP} = \frac{b}{100} \text{CP}$

Solving 1 and 2 we get $b = 1/11$ or 9.09%

22. Pipes and cisterns

An empty tank be filled with an inlet pipe 'A' in 42 minutes. After 12 minutes an outlet pipe 'B' is opened which can empty the tank in 30 minutes. After 6 minutes another inlet pipe 'C' opened into the same tank, which can fill the tank in 35 minutes and the tank is filled. Find the time taken to fill the tank?

Assume total tank capacity = 210 Liters

Now capacity of pipe A = $210/42 = 5$ Liters

Capacity of B = $210 / 30 = - 7$ Liters

Capacity of C = $210 / 35 = 6$ min

Assume tank gets filled in x min after the third pipe got opened.

So $x \times 5 + 6 \times (-2) + 4x = 210$

$\Rightarrow 48 + 4x = 210 \Rightarrow 4x = 162 \Rightarrow x = 40.5$

Total time taken to fill the tank = $40.5 + 12 + 6 = 58.5$

23. Averages

1) Mean of 3 numbers is 10 more than the least of the numbers and 15 less than greatest of the 3. If the median of 3 numbers is 5, Find the sum of the 3 numbers?

Ans: Median is when the given numbers are arranged in ascending order, the middle one. Let the numbers are x , 5 , y where x is the least and y is greatest.

Given that $x+5+y=3x+10$
and $x+5+y=3y-15$

Solving we get $x = 0$ and $y = 25$.

So sum of the numbers = $0 + 5 + 25 = 30$

2) Weight of M, D and I is 74. Sum of D and I is 46 greater than M. I is 60% less than D. What is D's weight.

Ans: 10

$$M + D + I = 74 \quad \text{--- (1)}$$

$$(D + I) - M = 46 \quad \text{--- (2)}$$

$$I = 0.4D$$

$$D \Rightarrow 5I = 2D \Rightarrow I = 2D/5 \quad \text{--- (3)}$$

Adding (1) and (2) we get $2D + 2I = 120$

Substituting the value of I in the above equation,

$$2D + 2(2D/5) = 120$$

$$\Rightarrow 14D = 600$$

\Rightarrow

$$D = 300/7 = 42.8$$

24.Simple equations

1) Apple costs L rupees per kilogram for first 30kgs and Q rupees per kilogram for each additional kilogram. If the price of 33 kilograms is 11.67 and for 36kgs of Apples is 12.48 then the cost of first 10 kgs of Apples is

Ans: By framing equations we get

$$30L+3Q=11.67$$

$$30L+6Q=12.48$$

Eliminate Q by multiplying the first equation by 2 and subtracting second equation from the first

Then we get $L = 0.362$

$$\text{Cost of 10 kgs of apples} = 0.362 \times 10 = 3.62$$

2) $xy+yx=46$ Find x & y values ?

$$\text{Sol: } 145+451=46$$

$$\text{Hence } x = 1, y = 45$$

3)Sum of two number is 50 & sum of three reciprocal is $1/12$ so find these two numbers

$$\text{Sol : } x+y = 50 \dots(1) \quad x=50-y \dots(2)$$

$$1x+1y=1/12 \Rightarrow y+xy=1/12 \Rightarrow 12(y+x)=xy \dots(3)$$

put (2) in (4)

$$\Rightarrow 12(y+50-y)=(50-y)y$$

$$\Rightarrow 12y+600-12y=50y-y^2$$

$$\Rightarrow y^2-50y+600=0$$

$$\Rightarrow y^2-30y-20y+600=0$$

$$\Rightarrow y(y-30)-20(y-30)=0$$

$$\Rightarrow (y-20)(y-30)=0$$

$$y=20 \text{ or } y=30$$

$$\text{if } y=20 \text{ then } x = 30$$

$$\text{or } y=30 \text{ then } x = 20$$

two numbers are 30 & 20

4) In a quadratic equation, (whose coefficients are not necessarily real) the constant term is not 0. The cube of the sum of the squares of its roots is equal to the square of the sum of the cubes of its roots.

Which of the following is true?

- a) Both roots are real
- b) Neither of the roots is real
- c) At least one root is non-real
- d) At least one root is real

Ans: Assume the given quadratic equation is $ax^2+bx+c=0$ whose roots are p, q .

Now given that $(\alpha^2+\beta^2)^3=(\alpha^3+\beta^3)^2$

By expanding we

$$\text{get, } \alpha^6+3.\alpha^4.\beta^2+3.\alpha^2.\beta^4+\beta^6=\alpha^6+\beta^6+2.\alpha^3.\beta^3$$

$$3.\alpha^2.\beta^2(\alpha^2+\beta^2)=2.\alpha^3.\beta^3$$

$$3.(\alpha^2+\beta^2)=2.\alpha.\beta$$

$$3.(\alpha^2+\beta^2)+6.\alpha.\beta-6.\alpha.\beta=2.\alpha.\beta$$

$$3.(\alpha+\beta)^2=8.\alpha.\beta \dots(1)$$

We know that sum of the roots = $\alpha+\beta=-\frac{b}{a}$

product of the roots = $\alpha.\beta=\frac{c}{a}$

Substituting in the equation (1) we

$$\text{get } 3.(-\frac{b}{a})^2=8.\frac{c}{a} \Rightarrow 3.b^2=8.a.c$$

The nature of the roots can be determined by finding

the magnitude of the determinant = $b^2 - 4ac$

But we know that $ac = 3b^2/8$

So $b^2 - 4ac = b^2 - 4 \cdot 3b^2/8 = -b^2/2 < 0$

So the roots are imaginary.

5) Raj writes a number. He sees that the number of two digits exceeds four times the sum of its digits by 3. If the number is increased by 18, the result is the same as the number formed by reversing the digits. Find the next immediate prime greater than the number.

Let the number be $xy = 10x + y$

$$10x + y = 4(x+y) + 3 \Rightarrow 2x - y = 1 \text{ -----(1)}$$

$$\text{Also } 10x + y + 18 = 10y + x, 9(y-x) = 18, y-x = 2 \text{ -----(2)}$$

Solving we get $x = 3, y = 5$

The number is 35. So next immediate prime is 37

25. problem on ages

1. In 10 years, A will be twice as old as B was 10 years ago. If A is now 9 years older than B the present age of B is

$$\text{Soln: } A + 10 = 2(B - 10) \text{(1)}$$

$$A = B + 9 \text{ (2)}$$

from equations. 1 & 2

we get $B = 39$ A will be $39 + 9 = 48$ years old.

26. Functions

1) If $f(f(n)) + f(n) = 2n+3$, $f(0) = 1$ then $f(2012) = ?$

Ans: 2013

$$f(f(0)) + f(0) = 2(0) + 3 \Rightarrow$$

$$f(1) = 3-1 = 2, f(1) = 2$$

$$f(f(1)) + f(1) = 2(1) + 3 \Rightarrow$$

$$f(2) = 5-2 = 3, f(2) = 3$$

$$f(f(2)) + f(2) = 2(2) + 3 \Rightarrow$$

$$f(3) = 7-3 = 4, f(3) = 4$$

.....

$$f(2012) = 2013$$

1) If $f(x) = ax^4 - bx^2 - x + 3$ and $f(3) = -2$, find $f(-3) = ?$

a) 2 b) 4 c) 6 d) 8

2) If $5+3+2 = 151022$, $9+2+4 = 183652$, $8+6+3 = 482466$ and $5+4+5 = 202541$, then $7+2+5$

a) 143547 b) 132234 c) 2577224 d) 112321

27.Direction sense

1)A child was looking for his father. He went 90 m in the east before turning to his right. he went 20 m before turning to his right afain to lok for his father at his uncles place 30 m from this point. His father was not there. From there he went 100m north before meeting hiss father in a street. How far did the son meet his father from the starting point.

- a) 90
- b) 30
- c) 80
- d) 100

From the diagram, $AB = 90 - 30 = 60$ and $BD = 100 - 20 = 80$

$$AD = \sqrt{AB^2 + BD^2} = \sqrt{60^2 + 80^2} = 100$$

27.SIMPLE AND COMPOUND INTEREST

8. At what rate per cent per annum will the SI on a sum of money be $\frac{2}{5}$ of the amount in 10 years?

- a) 6%
- b) $5\frac{2}{3}\%$

c) 4%

d) $6\frac{2}{3}\%$

Answer: c) 4%

Solution:

Let the sum of money be Rs 'x'. So $SI = 2x/5$

*So, $rate = (SI*100)/(P*Time)$*

*$\Rightarrow (2x*100)/(5*x*10)$*

$\Rightarrow 4\%$ (Answer)