



Topic – Permutations & Combinations

1) A family of a man, wife and their daughter is to be seated with three other bachelors on a round table with six chairs such that the daughter always sits adjacent to at least one of her parents. How many such arrangements are possible?

- a) 75
- b) 60
- c) 72
- d) 84

Correct Choice:d

Explanation:

Total possible arrangements = 5!

Now we calculate the arrangements in which no parent sits adjacent to the daughter

First we seat the daughter, now we seat two out of three bachelors on either side of her seat.

$$\text{Ways} = {}^3C_2 \times 2!$$

Now rest three can be arranged in 3! Ways

$$\text{Total ways in which daughter doesn't sit adjacent to her parents} = {}^3C_2 \times 2! \times 3! = 36$$

$$\text{Ways in which daughter sits adjacent to at least one parent} = 5! - 36 = 84$$



Hence, option D is correct.

Topic – Profit & Loss

2) For A and B the ratio of cost price is 4 : 5 and ratio of selling price is 4 : 7. The ratio of total cost price and total selling price is 45 : 44 and the net loss is Rs 20. What is the difference between their selling prices?

- a) Rs. 300
- b) Rs. 240
- c) Rs. 360
- d) Rs. 250

Correct Choice: b

Explanation:

Let the CP of A = 4x and B = 5x and SP of A = 4y and B = 7y

$$\frac{\text{Total SP}}{\text{Total CP}} = \frac{44}{45}$$

$$\frac{11y}{9x} = \frac{44}{45}$$



$$\frac{y}{x} = \frac{4}{5}$$

$$9x - 11y = 20$$

Solving the above equations we get,

$$x = 100 \text{ and } y = 80$$

$$\text{Difference between their SP} = 7y - 4y = 3y = 3 \times 80 = \text{Rs } 240$$

Hence, option B is correct.

Topic – Simple Interest – Compound Interest

3) A person has Rs. 40000 out of which he puts Rs. 12000 at 10% SI for 3 years and Rs 16000 at 12.5% CI for 2 years and keeps the rest with himself. What is the total amount with him after three years?

- a) Rs. 52240
- b) Rs. 35850
- c) Rs. 42650
- d) Rs. 47850

Correct Choice: d

Explanation:

$$\text{Amount left with him} = 40000 - 16000 - 12000 = 12000$$



Amount after 3 years

$$= 12000 + \left(1 + 3 \frac{10}{100}\right) 16000 + \left(1 + \frac{1}{8}\right)^2 = \text{Rs. } 47850$$

Hence, option D is correct.

Topic – Time & Distance

4) A can beat B by 160 m in a 1000 m race. When A and B run towards each other from the opposite ends of track XY, the difference between the distance travelled by them when they meet is 48 m. What is the length (in meter) of the track?

- a) 552
- b) 664
- c) 564
- d) 658

Correct Choice: a

Explanation:



$$\text{Ratio of speed } \frac{A}{B} = \frac{1000}{840} = \frac{25}{21}$$

Let the length of track be X

Difference between distance travelled by them

$$= \frac{(25 - 21) \times X}{25 + 21} = \frac{4X}{46}$$

$$\frac{4X}{46} = 48$$

$$X = 552 \text{ m}$$

Hence, option A is correct.

Topic – Percentages

5) A and B are two candidates in an election and a voter can vote for either A or B. Candidate A gets 66.67% of the votes got by candidate B. If only 90% of eligible voters cast their vote and B gets 64800 more votes than A, how many eligible voters were there?

- a) 326000
- b) 360000
- c) 420000
- d) 540000

Correct Choice: b



Explanation:

Let the total eligible voters = 100k

Votes cast = 90k

Ratio of votes got, $\frac{A}{B} = \frac{2}{3}$

Difference between the votes of A and B = $\frac{1 \times 90k}{5} = 18 \text{ k}$

18k = 64800

So 100k = 360000

Hence, option B is correct.

Topic – Time & Work

6) A, B and C can complete a work in 20, 30 and 25 days respectively. A and B work together for 8 days and C joins them on every second day, then D alone works for two days and the remaining work is done by C alone in 1 day. In how many days D alone can complete 80% of the work?

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

Correct Choice: d

Explanation:

Let the total work = 300k

$$\text{Efficiency of A} = \frac{300k}{20} = 15k,$$

$$B = \frac{300k}{30} = 10k$$

$$\text{and C} = \frac{300k}{25} = 12k$$

Let efficiency of D = Z

$$\text{Work done by A and B} = 15k + 10k = 25k$$

$$\text{Work done by A, B and C} = 15k + 10k + 12k = 37k$$

Work done in 8 days (by A and B joined by C on every second day)

$$= \frac{8}{2} \times (25 + 37) = 224k$$



Work done by C alone in 1 day = 12k

Work done by D in 2 days = 300k – 248k – 12k = 40k

Per day work of D = 20k

Time taken by D to do 80% of work

$$= \frac{8}{10} \times \frac{30}{20} = 12 \text{ days}$$

Hence, option d is correct.

Topic – Pipes & Cisterns

7) Pipe A and B can fill a tank in 16 hrs and 32 hrs respectively while C alone can empty it in 20 hrs. When the tank is empty Pipe A and B are opened, '2x' hrs later A is closed and C is opened, 'x' hrs later B is closed and A is opened and '6x + 2' hrs later tank is full. What is the total time(in hrs) taken to fill the tank?

- a) 38
- b) 22
- c) 42
- d) 35

Correct Choice: a

Explanation:

Let tank capacity = 160k



$$\text{Efficiency of A} = \frac{160k}{16} = 10k,$$

$$B = \frac{160k}{32} = 5k \text{ and } C = \frac{160k}{20} = 8k$$

$$(10k + 5k) \times 2x + (5k - 8k) \times x + (10k - 8k) \times (6x + 2) = 160k$$

$$x = 4$$

$$\text{Total time} = 2x + x + 6x + 2 = 9x + 2 = 38 \text{ hrs}$$

Hence, option A is correct.

Topic – Volumes

8) A tent has a cylindrical base and conical top. The height of tent is 61m and that of cylindrical portion is 40m the radius of tent is 28 m. What is the total area of cloth required to make the tent?

- a) 10450 m²
- b) 12540 m²
- c) 10120 m²
- d) 9750 m²

Correct Choice: c

Explanation:



Height of the cone = $61 - 40 = 21$ m and radius of cone = 28 m

So, Slant height of cone = $\sqrt{(21^2 + 28^2)} = 35$ m

Total surface area = $2\pi rh + \pi r l$

$$= \frac{22}{7} \times 28 \times (2 \times 40 + 35) = 10120 \text{ m}^2$$

Hence, option C is correct.

Topic – Areas

9) A prism has a triangular base with sides 30cm, 34cm and 16cm. If the volume of the prism is 2960 cm^2 , what is the height (in cm) of the prism?

- a) 14.5
- b) $12\frac{1}{3}$
- c) 15



d) 9.5

Correct Choice: b

Explanation:

$$\text{As } 34^2 = 30^2 + 16^2$$

Area of the base of the prism

$$= \frac{1}{2} \times 30 \times 16 = 240 \text{ cm}^2$$

$$\text{Volume of the prism} = 240 \times h = 2960$$

$$H = \frac{2960}{240} = \frac{1}{3} \text{ c}$$

Hence, option B is correct.

Topic – Averages

10) The average weight of a class of N students is 47kg. If 8 students with average weight of 53kg leave the class and 3 new students with average weight 56kg join the class, the average weight of the class decreases by 0.6kg. What is the number of students in class now?

- a) 40
- b) 42
- c) 37



d) 35

Correct Choice: d

Explanation:

Total weight initially = $N \times 47$

Total weight of class now = $(N - 8 + 3) \times (47 - 0.6) = (N - 5)46.4$

$N \times 47 - 8 \times 53 + 3 \times 56 = (N - 5) \times (46.4)$

$N = 40$

Number of students in the class now = $N - 5$

$= 40 - 5 = 35$

Hence, option D is correct.

Topic – Geometry (Triangles)

11) A triangle has sides 39 cm, 80 cm and 89 cm, what is circumference (in cm) of its incircle?

- a) 15π
- b) 30π
- c) 64π
- d) 24π

Correct Choice: b



Explanation:

As we can see, $39^2 + 80^2 = 89^2$

So, area of triangle = $\frac{1}{2} \times 39 \times 80 = 1560 \text{ cm}^2$

Perimeter of triangle = $(39 + 80 + 89) = 208 \text{ cm}$

Semi perimeter, $s = \frac{208}{2} = 104 \text{ cm}$

Inradius = $\frac{A}{s} = \frac{1560}{104} = 15$

Circumference = $2\pi r = 2\pi (15) = 30\pi$

Hence, option B is correct.

Topic – Percentages

12) In a class, 37.5% of the students are Girls and rest are boys. If 60% of the girls are present and 80% of the boys are present, then what percent of the total number of students in the class are absent?

- a) 32.5%
- b) 28.6%
- c) 27.5%
- d) 31.5%

Correct Choice: c



Explanation:

Let the total number of students = 80k

Girls = 37.5% (80k) = 30k and Boys = 50k

Girls absent = 40%(30k) = 12k

Boys absent = 20%(50k) = 10k

Total students absent = 10k + 12k = 22k

$$\text{Reqd. \%} = \frac{22}{80} \times 100 = 27.5\%$$

Hence, option C is correct.

Topic – Problems on Numbers

13) When a two-digit number is multiplied by the sum of its digits, the product is 913. When the number obtained by interchanging its digits is multiplied by the sum of the digits, the result is 418. The difference of the digits of the given number is:

- a) 4
- b) 6
- c) 7
- d) 5



Correct Choice: d

Explanation:

Let the number be ab , numerical value = $10a + b$

$$(10a + b)(a + b) = 913 \text{ ----- (1)}$$

When the digits are interchanged number = $ba = 10b + a$

$$(10b + a)(a + b) = 418 \text{ ----- (2)}$$

By doing 1 – 2

$$(a + b)(9a - 9b) = 913 - 418$$

$$(a - b)(a + b) = \frac{49}{9}$$

$$(a + b)(a - b) = 55$$

$$a + b = 11 \text{ and } a - b = 5$$

Required difference = 5

Hence, option D is correct.

Topic – Partnership



14) A, B and C start a business. A invest 40% more than C, who invests 66.67% more than B. If the total profit at the end of the year is Rs.244500, what is the share (in Rs.) of A in the profit?

- a) 124500
- b) 114100
- c) 142625
- d) 130400

Correct Choice: b

Explanation:

$$\frac{A}{C} = \frac{14}{10} = \frac{7}{5}$$

$$\frac{C}{B} = \frac{5}{3}$$

$$A : B : C = 7 : 3 : 5$$

Let the profit share of A = 7k, B = 3k and C = 5k

Total profit = 15k

$$\text{Profit share of A} = \frac{7k}{15} \times 244500$$

$$= \text{Rs. } 114100$$



Hence, option B is correct

Topic – HCF & LCM of Numbers

15) The HCF of two numbers is 35 and their LCM is 299 times the HCF. If one of the numbers lies between 400 and 500, the sum of the digits of the other number is :

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- a) 13
- b) 15
- c) 14
- d) 17

Correct Choice : a

Explanation:

Let the numbers be $35a$ and $35b$

$$\text{LCM} = 299 \times 35$$

$$\text{HCF} \times \text{LCM} = \text{Product of digits}$$

$$299 \times 35 \times 35 = 35a \times 35b$$

$$a \times b = 299$$

$$a \times b = 13 \times 23$$

$$a = 13 \text{ and } b = 23$$



$$35a = 455 \text{ and } 35b = 805$$

35a lies between 400 and 500

$$\text{Sum of the digits odd } 805 = 8 + 0 + 5 = 13$$

Hence, option A is correct

Topic – Percentages

16) If 55% of a number is 224 more than 20% of the number, then 35% of the number is less than 62.5% of the number by:

- a) 164
- b) 166
- c) 182
- d) 176

Correct Choice: d

Explanation:

Let the number be 100k

$$55\%(100k) - 20\%(100k) = 224$$

$$35k = 224$$

$$100k = 640$$

$$35\% (640) = 224$$

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$$62.5\% (640) = 400$$

$$\text{Required difference} = 400 - 224 = 176$$

Hence, option D is correct.