

Question

1. The smallest integer x for which the inequality $\frac{x-7}{x^2+5x-36} > 0$ is given by
- a. -12
 - b. 9
 - c. -9
 - d. -8

Solution

$$\frac{x-7}{x^2+5x-36} > 0$$

$$\frac{x-7}{(x+9)(x-4)} > 0$$

So inequality hold true for

$$(-9, 4) \cup (7, \infty)$$

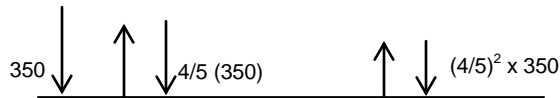
∴ Least integer satisfying the inequality is -8

Option (d).

Question

2. A child, playing at the balcony of his multi-storied apartment, drops a ball from a height of 350 m. Each time the ball rebounds, it rises $\frac{4}{5}$ th of the height it has fallen through. The total distance travelled by the ball before it comes to rest is
- a. 2530 m
 - b. 2800 m
 - c. 3150 m
 - d. 3500 m

Solution



As per the above diagram

The total distance covered is

$$D = 350 + 2 \left[\left(\frac{4}{5} \right) 350 + \left(\frac{4}{5} \right)^2 \times 350 \dots \dots \dots \infty \right]$$

$$D = 350 + 2 \left[\frac{\frac{4}{5} (350)}{1 - \frac{4}{5}} \right]$$

$$= 350 + 2 \times 4 \times 350$$

$$= 3150 \text{ m}$$

option (c)

3.

Question

Find the value of x which satisfies the following equation

$$4\log_7(x - 8) = \log_3 81$$

- a. 8
- b. 18
- c. 20
- d. None of the above

Solution

$$4 \log_7 (x - 8) = \log_3 81$$

$$4 \log_7 (x - 8) = \log_3 3^4$$

$$4\log_7 (x - 8) = 4 \log_3 3$$

$$\log_7 (x - 8) = 1$$

$$x - 8 = 7$$

$$x = 15$$

option (d)

Question

4. A playschool contains 4 boys and y girls. On every Wednesday during winter, five students, of which at least three are boys, go to Zoological Garden, a different group being sent every week. At the Zoological Garden, each boy in the group is given a ball. If the total number of balls distributed is 368, then the value of y is

- a. 5
- b. 6
- c. 7
- d. 8

Solution

If 3 boys selected then

$${}^4C_3 \times {}^yC_2 \times 3 \text{ balls distributed}$$

and if 4 boys selected then

$${}^4C_4 \times {}^yC_1 \times 4 \text{ balls distributed}$$

$$4 \times {}^yC_2 \times 3 + y \times 4 = 368$$

$$\frac{y(y-1)}{2} \times 3 + y = 92$$

$$3y^2 - 3y + 2y = 184$$

$$3y^2 - y - 184 = 0$$

$$3y^2 - 24y + 23y - 184 = 0$$

$$3y(y - 8) + 23(y - 8) = 0$$

$$(y - 8)(3y + 23) = 0$$

$$y = 8$$

option (d)

Question

5. Which of the following statements regarding arrangement of the word 'RIYADH' is / are true:
- (i) Two vowels can be arranged together in 120 ways
 - (ii) Vowels do not occur together in 240 ways
- Which of the above statements are true?
- a. Statement (i) only
 - b. Statement (ii) only
 - c. Both statements (i) and (ii)
 - d. None of the above

Solution

RIYADH

2 vowels together

(IA) RYDH

$$5! 2! = 240$$

∴ Statement (i) is wrong.

$$\text{Total number of cases} = 6! = 720$$

$$\text{Vowels together} = 240$$

$$\text{So vowels do not occur together} = 720 - 240 = 480$$

∴ Statement (ii) is wrong.

Option (d).

Question

6. Two farmers were cultivating wheat on their respective agricultural land in a village. Farmer A had an average production of 20 bushels from a hectare. Farmer B, who had 15 hectares of more land dedicated to wheat cultivation, had an output of 30 bushels of wheat from a hectare. If farmer B harvested 350 bushels of wheat more than farmer A, how many bushels of wheat did farmer A cultivate?
- a. 50
 - b. 80
 - c. 160
 - d. 200

Solution

Average production for farmer A is 20 b / hectare. Let he has x hectare land

Farmer B = 30 b / hectare

Now he has (x + 15) hectare land

Total production by two farmers is 20 x and 30 (x + 15)

$$\text{given that } 30(x + 15) - 20x = 530$$

$$\therefore x = 8$$

Production of farmer A = $8 \times 20 = 160$ bushels.

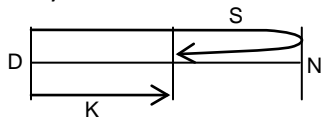
Question

7. Shruti and Krishan left Delhi for Noida at the same time. While Shruti was driving her car, Krishna, an environmentalist by profession, was travelling on his bicycle. Having reached Noida, Shruti turned back and met Krishna an hour after they started. Krishna continued his journey to Noida after the meeting, while Shruti turned back and also headed for Noida. Having reached Noida, Shruti again turned back and met Krishna 30 minutes after their first meeting. The time taken by Krishna to cover the distance between Delhi and Noida is
- 2 hours
 - 2.5 hours
 - 3 hours
 - None of the above

Solution

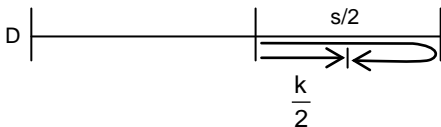
Let the distance between Delhi and Noida is D let the speed of shruti and Krishna are S and K respectively

They meet for the first time after 1 hour.



$$\text{Then } S + K = 20 \quad \text{---(1)}$$

After this shruti changes the direction and reaches Noida and turned back to meet Krishna second time after $\frac{1}{2}$ hr



Distance covered by them is

$$\frac{s}{2} + \frac{k}{2} = 2(D - K)$$

$$S + K = 4D - 4K$$

$$S + 5K = 4D \quad \text{---(2)}$$

Solving the two equations

$$4K = 2D$$

$$K = \frac{D}{2} \text{ or } D = 2K$$

So Krishna can cover the distance in 2 hours. Option (a).

Question

8. In a local shop, as part of promotional measures, the shop owner sells three different varieties of soap, one at a loss of 13 percent, another at a profit of 23 percent and the third one at a loss of 26

percent. Assuming that the shop owner sells all three varieties of soap at the same price, the approximate percentage by which average cost price is lower or higher than the selling price is

- a. 10.5 higher
- b. 12.5 lower
- c. 14.5 lower
- d. 8.5 higher

Solution

Let the SP of each of the 3 varieties is Rs. 100 then CP of

$$\text{Variety 1} = \frac{100 \times 100}{87} = 114.9$$

$$\text{Variety 2} = \frac{100 \times 100}{123} = 81.3$$

$$\text{Variety 3} = \frac{100 \times 100}{74} = 135.13$$

Average SP = Rs.100

$$\text{Average CP} = \frac{114.9 + 81.3 + 135.13}{3} = \frac{331.3}{3} = 110.4$$

So cost price is higher than the SP by $110.4 - 100 = 10.4\%$. option (a).

Question

9. In the marketing management course of an MBA programme, you and your roommate can complete an assignment in 30 days. If you are twice as efficient as your roommate, the time required by each to complete the assignment individually is
- a. 45 days and 90 days
 - b. 30 days and 60 days
 - c. 40 days and 120 days
 - d. 45 days and 135 days

Solution

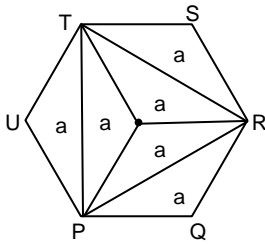
	Y	RM	
R	2	1	3
T	45	90	30
W	90	90	90

Option (a).

Question

10. Let PQRSTU be a regular hexagon. The ratio of the area of the triangle PRT to that of the hexagon PQRSTU is
- a. 0.3
 - b. 0.5
 - c. 1
 - d. None of the above

Solution



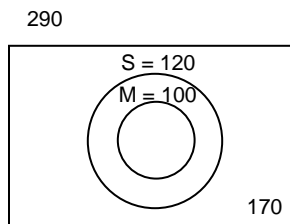
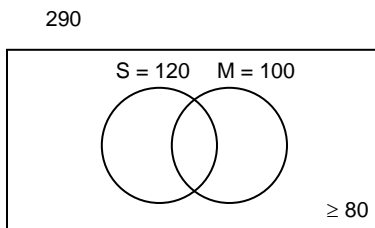
$$\frac{\text{Area PRT}}{\text{Area PQRSTU}} = \frac{3a}{6a} = .5$$

Option (b).

Question

11. 290 students of MBA (International Business) in a reputed Business School have to study foreign language in Trimester IV and V. Suppose the following information are given
- (i) 120 students study Spanish
 - (ii) 100 students study Mandarin
 - (iii) At least 80 students, who study a foreign language, study neither Spanish nor Mandarin
- Then the number of students who study Spanish but not Mandarin could be any number from
- a. 80 to 170
 - b. 80 to 100
 - c. 50 to 80
 - d. 20 to 110

Solution



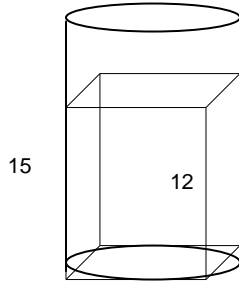
$n(S \cup M) = n(S) + n(M) - n(S \cap M)$
 $(290 - 80) = 120 + 100 - n(S \cap M)$
 $n(S \cap M) = 220 - 210 = 10$
 \therefore Spanish only = $120 - 10 = 110$
 For case II, Spanish only is $120 - 100 = 20$.
 So correct option is D

Question

12. A right circular cylinder has a height of 15 and radius 7. A rectangular solid with a height of 12 and a square base, is placed in the cylinder such that each of the corners of the solid is tangent to the cylinder wall. Liquid is then poured into the cylinder such that it reaches the rim. The volume of the liquid is

- a. $147(5\pi - 8)$
- b. $180(\pi - 5)$
- c. $49(5\pi - 24)$
- d. $49(15\pi - 8)$

Solution



$$\text{Volume of cylinder} = \pi r^2 h$$

$$= \pi \times 7 \times 7 \times 15$$

$$\text{Diagonal of solid base} = 7 + 7 = 14$$

$$\text{So side of base} = \frac{14}{\sqrt{2}} = 7\sqrt{2}$$

$$\therefore \text{Volume of solid} = (7\sqrt{2})^2 \times 12$$

$$\text{Volume of water} = \pi \times 7 \times 7 \times 15 - (7\sqrt{2})^2 \times 12$$

$$= 147(5\pi - 8)$$

Option (a).

Question

13. A reputed paint company plans to award prizes to its top three salespersons, with the highest prize going on the top salesperson, the next highest prize to the next salespersons and a smaller prize to the third ranking salespersons. If the company has 15 salespersons, how many different arrangements of winners are possible (Assume there are no ties)?
- a. 1728
 - b. 2730
 - c. 3856
 - d. 1320

Solution

$$\text{No. of ways} = {}^{15}P_3 = 15 \times 14 \times 13 = 2730$$

Option (b)

Question

14. What is the sum of the integers 54 through 196 inclusive?
- a. 28,820
 - b. 24,535
 - c. 20,250
 - d. 17,875

Solution

$$S = 54 + 55 + 56 \dots\dots\dots 196$$

$$= \frac{143}{2}(54 + 196)$$

$$= 17875 \text{ option (d).}$$

Question

15. The student mess committee of a reputed Engineering College has n members. Let P be the event that the Committee has students of both sexes and let Q be the event that there is at most one female student in the Committee. Assuming that each committee member has probability 0.5 of being female, the value of n for which the events A and B are independent is
- 2
 - 3
 - 4
 - None of the above

Solution

Cases	Male members	Female members	event P	event Q	P∩Q
1	n	0	x	✓	x
2	n-1	1	✓	✓	✓
3	n-2	2	✓	x	x
.	.	.	✓	x	x
.	.	.	✓	x	x
.	.	.	✓	x	x
n+1	0	n	x	x	x
Total	n+1	n+1	n-1	2	1

For P and Q to be independent events, $P(P) \times P(Q) = P(P \cap Q)$
Hence, $1/(n+1) = (n-1)/(n+1) \times 2/(n+1)$
On solving, we get n = 3.
Option (b)

Question

16. A multi-stories office building has a total of 17 rows of parking spaces. There are 20 parking spaces in the first row and 21 parking spaces in the second row. In each subsequent row, there are 2 more parking spaces than in the previous row. The total number of parking spaces in the office building is
- 380
 - 464
 - 596
 - 712

Solution

The total number of parking spaces are
 $20 + (21 + 23 + 25 + \dots\dots\dots 16 \text{ terms})$

$$20 + \frac{16}{2} [2 \times 21 + (16 - 1)2]$$

$$20 + 16 (21 + 15)$$

$$20 + 16 \times 36$$

$$20 + 576 = 596$$

Option (c).

Question

17. The highest number amongst $\sqrt{2}$, $\sqrt[3]{3}$ and $\sqrt[4]{4}$ is

- a. $\sqrt{2}$
- b. $\sqrt[3]{3}$
- c. $\sqrt[4]{4}$
- d. All are equal

Solution

$$\sqrt{2} = \sqrt[6]{2^3} = \sqrt[6]{8}$$

$$3\sqrt{3} = \sqrt[6]{3^2} = \sqrt[6]{9}$$

$$\sqrt[4]{4} = \sqrt{2} = \sqrt[6]{8}$$

$\therefore \sqrt[6]{9}$ or $\sqrt[3]{3}$ is largest

Question

18. In an MBA entrance examination, a minimum is to be secured in each of the 6 sections to qualify the cut-offs. In how many ways can a candidate fail to secure the cut-offs?

- a. 60
- b. 61
- c. 62
- d. 63

Solution

Total number of ways are $2^6 = 64$

Out of these only 1 way to clear cutoff in all the sections

\therefore Number of ways a candidate can fail to secure cutoff = $64 - 1 = 63$

Option (d).

Question

19. The sum of $4 + 44 + 444 + \dots$ Upto n terms is

- a. $\frac{40}{81}(8^n - 1) - \frac{5n}{9}$
- b. $\frac{40}{81}(8^n - 1) - \frac{4n}{9}$
- c. $\frac{40}{81}(10^n - 1) - \frac{4n}{9}$
- d. $\frac{40}{81}(10^n - 1) - \frac{5n}{9}$

Solution

$S = 4 + 44 + 444 + \dots$ n terms

$$\begin{aligned}
S &= \frac{4}{9} [9 + 99 + 999 \dots \dots \dots n \text{ terms}] \\
&= \frac{4}{9} ((10 - 1) + (100 - 1) + (1000 - 1) \dots) \\
&= \frac{4}{9} [10 + 100 + 1000 \dots \dots \dots n] \\
&= \frac{4}{9} \left[\frac{10(10^n - 1)}{10 - 1} - n \right] \\
&= \frac{40}{81} (10^n - 1) - \frac{4}{9} n
\end{aligned}$$

Option (c).

Question

20. Suppose the two sides of a square are long the straight lines $6x - 8y = 15$ and $4y - 3x = 2$. Then the area of the square is
- 2.52 Sq. units
 - 3.61 Sq. units
 - 4.33 Sq. units
 - None of the above

Solution

The equations can be re-written is $3x - 4y = \frac{15}{2}$
and $3x - 4y = -2$.

Side of the square is the distance between these two parallel lines which is $\frac{\frac{15}{2} + 2}{\sqrt{3^2 + 4^2}} = 1.9$

Therefore ratio of square = $1.9^2 = 3.61$ option (b).