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Reasoning and Aptitude

CIVIL ENGINEERING

Date of Test : 03/09/2026

ANSWER KEY ➤

1. (d)	7. (c)	13. (a)	19. (b)	25. (c)
2. (c)	8. (b)	14. (a)	20. (c)	26. (a)
3. (b)	9. (b)	15. (c)	21. (a)	27. (a)
4. (b)	10. (b)	16. (c)	22. (d)	28. (d)
5. (d)	11. (c)	17. (a)	23. (c)	29. (d)
6. (d)	12. (c)	18. (a)	24. (d)	30. (d)

DETAILED EXPLANATIONS

1. (d)

Surreptitious : Done secretly

I had a surreptitious look at what she was writing.

2. (c)

3. (b)

It means to waste effort on something or engaging in a fruitless effort.

Example : He keeps trying to get his book published, but I think he is flogging a dead horse.

4. (b)

$$\begin{aligned}\text{Let,} \quad & \text{Jyoti's age} = x \\ & \text{Jyoti's mother's age} = 6x \\ \therefore & 3(x + 5) = 6x \\ & 3x + 15 = 6x \\ & 3x = 15 \\ & x = 5\end{aligned}$$

5. (d)

The possibilities are:

4 from part A and 6 from part B.

or 5 from part A and 5 from part B.

or 6 from part A and 4 from part B.

Therefore, the required number of ways is

$$\begin{aligned}{}^6C_4 \times {}^7C_6 + {}^6C_5 \times {}^7C_5 + {}^6C_6 \times {}^7C_4 &= \frac{6!}{4! \times 2!} \times \frac{7!}{6! \times 1!} + \frac{6!}{5! \times 1!} \times \frac{7!}{5! \times 2!} + \frac{6!}{6!} \times \frac{7!}{4! \times 3!} \\ &= 105 + 126 + 35 = 266\end{aligned}$$

6. (d)

Let the original price be Rs. x

$\therefore (100 - r)\%$ of $(100 + r)\%$ of $x = 1$

$$\begin{aligned}\frac{(100 - r)}{100} \times \frac{(100 + r)}{100} \times x &= 1 \\ x &= \frac{100 \times 100}{(100 - r)(100 + r)} = \frac{10000}{(10000 - r^2)}\end{aligned}$$

Alternative :

Let original price = Rs x

After $r\%$ increase, price = $(100 + r)\%$ of $x = \frac{(100 + r)x}{100}$

New price after $r\%$ decrease,

$$\begin{aligned}&= (100 - r)\% \text{ of } \left[\frac{(100 + r)x}{100} \right] \\ &= \frac{(100 - r)(100 + r)}{100 \times 100} x = 1 \text{ (given)}\end{aligned}$$

$$\text{Hence,} \quad x = \frac{100 \times 100}{(100 - r)(100 + r)}$$

7. (c)

L.C.M of 5, 6, 7, 8 = 840

 $\therefore$ Required number is of the form $840k + 3$ Least value of k for which $(840k + 3)$ is divisible by 9 is $k = 2$. $\therefore$ Required number = $840 \times 2 + 3 = 1683$

8. (b)

We have

$$\frac{2x}{1 + \frac{1}{(1-x)+x}} = 1$$

$$\frac{2x}{1+(1-x)} = 1$$

$$2x = 1 + 1 - x$$

$$x = \frac{2}{3}$$

9. (b)

$$71 - 5 = 66 ; \quad 66 + 9 = 75 ;$$

$$70 + 9 = 79 ; \quad 74 + 9 = 83$$

$$75 - 5 = 70 ; \quad 79 - 5 = 74$$

10. (b)

One clock shows 10 pm (on 21st Jan, 2010)

One clock gains = 2 min

Other clock loses = 5 min

Time period between 10 pm and 4 pm = 18 hrs

 $\therefore$ Required difference = $(2 \times 18 + 5 \times 18)$ min = 126 min

11. (c)

$$P = \text{Rs. } 600$$

$$A = \text{Rs. } 720$$

$$T = 4 \text{ years}$$

$$R = ?$$

$$R = \frac{\text{S.I.} \times 100}{P \times T} = \frac{120 \times 100}{600 \times 4} = 5\%$$

At 7% rate,

$$\text{S.I.} = \frac{600 \times 7 \times 4}{100} = 168$$

$$A = 600 + 168 = 768$$

12. (c)

$$\text{Man} \times \text{Day} = \text{Man} \times \text{Day}$$

$$20 \times 30 = 600$$

Let workers leave after x days then

$$20x + 15(35 - x) = 600$$

$$20x + 525 - 15x = 600$$

$$5x = 75$$

$$x = 15$$

13. (a)

$$\begin{aligned}\text{Average speed} &= \frac{\text{Distance Covered}}{\text{Time Taken}} \\ &= \frac{\frac{D}{3} + \frac{D}{3} + \frac{D}{3}}{\frac{D}{3} \times \frac{1}{20} + \frac{D}{3} \times \frac{1}{10} + \frac{D}{3} \times \frac{1}{60}} = \frac{3}{\frac{1}{20} + \frac{1}{10} + \frac{1}{60}} = \frac{3}{\frac{3+6+1}{60}} = \frac{3 \times 60}{10} = 18 \text{ km/h}\end{aligned}$$

14. (a)

Let the amounts invested be x, y, z respectively.

$$\text{Then, } \frac{x \times 2 \times 5}{100} = \frac{y \times 3 \times 5}{100} = \frac{z \times 4 \times 5}{100} = k$$

$$\therefore x = 10k, y = \frac{20}{3}k \text{ and } z = 5k$$

$$\text{So, } x : y : z = 10k : \frac{20}{3}k : 5k = 30 : 20 : 15 = 6 : 4 : 3$$

15. (c)

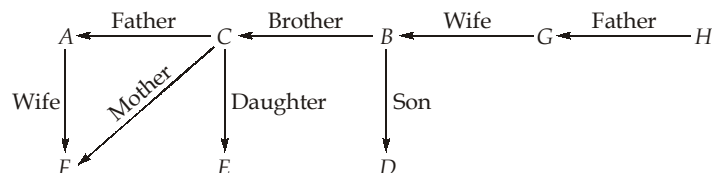
Let pipe A can fill in x and pipe B in $x + 5$ minutes.

$$\frac{1}{x} + \frac{1}{x+5} = \frac{1}{6}$$

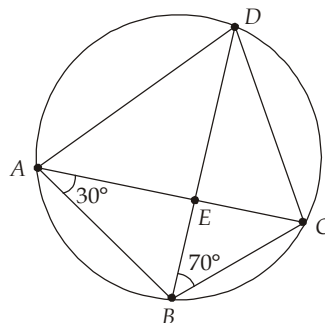
$$\text{or } \frac{x(x+5)}{2x+5} = 6$$

$$x = 10 \text{ and } x + 5 = 15$$

16. (c)



17. (a)



$$\angle CAD = \angle DBC = 70^\circ \quad (\text{Angles in the same segment})$$

$$\begin{aligned}\therefore \angle DAB &= \angle CAD + \angle BAC \\ &= 70^\circ + 30^\circ = 100^\circ\end{aligned}$$

$$\text{But, } \angle DAB + \angle BCD = 180^\circ \quad (\text{Opposite angle of cyclic quadrilateral})$$

$$\text{So, } \angle BCD = 180^\circ - 100^\circ = 80^\circ$$

Now, we have $AB = BC$

Therefore, $\angle BCA = 30^\circ$

Again, $\angle DAB + \angle BCD = 180^\circ$

(Opposite angle of cyclic quadrilateral)

$$100^\circ + \angle BCA + \angle ECD = 180^\circ$$

$$100^\circ + 30^\circ + \angle ECD = 180^\circ$$

$$\angle ECD = 50^\circ$$

18. (a)

$$n(A \cup B \cup C) = n(A) + n(B) + n(C) - n(A \cap B) - n(A \cap C) - n(B \cap C) + n(A \cap B \cap C)$$

$$\text{or } n(A \cap B) + n(A \cap C) + n(B \cap C)$$

$$= 550 - 350 = 200$$

Number of people in exactly two sets is given as

$$= n(A \cap B) + n(A \cap C) + n(B \cap C) - 3n(A \cap B \cap C)$$

$$= 200 - 3 \times 50$$

$$= 50$$

19. (b)

'Agree to' means to commit to (a course of action, a proposal, etc.)

'Agree with' means to have the same opinion as another person or to approve of something.

20. (c)

21. (a)

22. (d)

(a) Height $CD = \sqrt{6^2 - 3^2}$

$$CD = 3\sqrt{3} \text{ unit}$$

(b) radius of circumscribed circle,

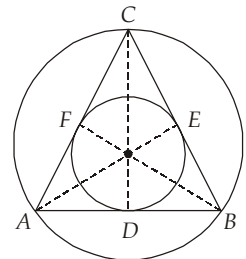
$$= \frac{2}{3} \times 3\sqrt{3} = 2\sqrt{3} \text{ unit}$$

(c) radius of inscribed circle

$$= \frac{1}{3} \times 3\sqrt{3} = \sqrt{3} \text{ unit}$$

(d) area of this equilateral triangle

$$= \frac{\sqrt{3}}{4} \times 36 = 9\sqrt{3} \text{ unit}^2$$



23. (c)

Suppose, the quantity sold at loss be y kg.

Let CP per kg = x

$$\text{Total SP} = 1.1 \times (20 - y)x + 0.95 \times y \times x$$

$$= (22 - 1.1y + 0.95y) \times x$$

$$= (22 - 0.15y) \times x = 1.08x \times 20$$

$$22 - 0.15y = 21.6$$

$$y = \frac{0.4}{0.15} = 2.67 \text{ kg}$$

24. (d)

Let equal sides of the isosceles triangle be x ,

Then $x^2 + x^2 = 10^2$

$$x = 5\sqrt{2} \text{ cm}$$

So,

$$\begin{aligned} \text{Final area} &= 8 \times \left(\frac{1}{8} \times \pi \times 10^2 - \frac{1}{2} 5\sqrt{2} \times 5\sqrt{2} \right) \\ &= \pi \times 10^2 - 4 \times 25 \times 2 \\ &= 100\pi - 200 \\ \text{Area} &= 114.16 \text{ cm}^2 \end{aligned}$$

25. (c)

Let the breadth of the rectangular part be x m,

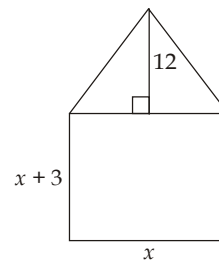
So, its length = $(x + 3)$ m

Therefore, the area of the rectangular park

$$= x(x + 3) \text{ m}^2$$

Now, base of the isosceles triangle = x m

Therefore, its area = $\frac{1}{2} \times x \times 12 = 6x \text{ m}^2$



According to our requirements,

$$x^2 + 3x = 6x + 4$$

$$x^2 - 3x - 4 = 0$$

$$x = \frac{3 \pm \sqrt{25}}{2} = 4 \text{ or } -1$$

$\therefore$ Length of the part = $4 + 3 = 7$ m

26. (a)

$$\frac{2\pi r}{4a} = \frac{11}{6}$$

$$\text{or } \frac{r}{a} = \frac{7}{6}$$

where, r = radius of circle and a = side of square.

Given : $r + a = 26$

$$a = \frac{6}{13} \times 26 = 12$$

Hence, Area of square = $12 \times 12 = 144 \text{ m}^2$

27. (a)

Total mixture = 48 litres

$M : W = 3 : 1$

Milk = 36

Water = 12

10 litre mixture is taken out and 20 litre pure water is added.

Now, Milk = $36 - 7.5 = 28.5$

$$\begin{aligned}
 \text{Water} &= 12 - 2.5 + 20 \\
 &= 29.5 \\
 \text{Required difference} &= 29.5 - 28.5 \\
 &= 1 \text{ litre}
 \end{aligned}$$

28. (d)

Let marked price of article = $100x$ **1st case :** 10% discount on the MP, so

$$\text{Selling Price} = 100x - 10x = 90x$$

2nd case : 20% discount on the MP so,

$$\text{Selling Price} = 100x - 20x = 80x$$

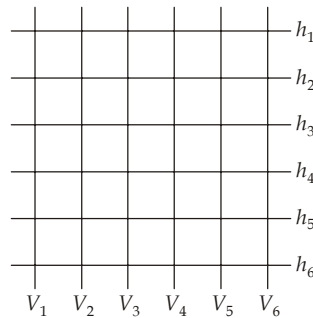
Cost price in both cases will be same.

$$\text{So, } 90x - 400 = 80x - 330$$

$$\text{or } x = 7$$

So, marked price of article = $100x = 700$.

29. (d)



Here V_1 to V_6 represent six parallel vertical lines and h_1 to h_6 represent six parallel horizontal lines.

To form a rectangle we need to select any two horizontal parallel lines which intersect any two vertical parallel lines. Thus,

$${}^6C_2 \times {}^6C_2 = 15 \times 15 = 225$$

225 rectangles will be formed.

30. (d)

Let the number of sides be n .

$$\therefore {}^nC_2 - n = 44$$

$$\frac{n(n-1)}{2} - n = 44$$

$$\frac{n^2 - n - 2n}{2} = 44$$

$$n^2 - 3n - 88 = 0$$

$$n^2 - 11n + 8n - 88 = 0$$

$$n(n-11) + 8(n-11) = 0$$

$$n = 11, -8$$

