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REASONING AND APTITUDE

EC + EE

Date of Test : 17/07/2025

ANSWER KEY ➤

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

DETAILED EXPLANATIONS

1. **(a)**

$$\text{Amount due in 3 years} = 3P$$
$$\text{Simple Interest} = 3P - P = 2P$$
$$\text{Time} = \frac{SI \times 100}{P \times R}$$
$$\frac{2P \times 100}{P \times 16} = \frac{25}{2} = 12\frac{1}{2}\text{ years}$$
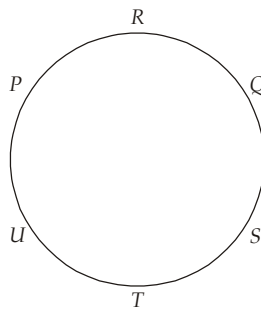
2. **(c)**

$$v = d/t$$
$$v + 8 = \frac{250}{15} \times \frac{18}{5}$$
$$v = 52 \text{ km/hr}$$

3. **(c)**

When this figure is folded to form a cube then the face bearing three dots will lie opposite the face bearing five dots.

4. **(d)**

5. **(d)**

Since Sonal and Meena exchange places, so Sonal's new position is same as Meena's earlier position. This position is 16th from the right and 9th from the left.
Therefore number of girls in the row
$$= (15 + 1 + 8) = 24$$

6. **(a)**

Let the least amount of wages be ₹x
$$x + (x + 20) + (x + 40) + (x + 60) = 4 \times 60$$
or, $$4x + 120 = 240$$
$$4x = 240 - 120 = 120$$
Therefore, $$x = ₹30$$

7. **(c)**

Nalni is the daughter of the only son of Gopi's grandfather. Hence, it's clear that Nalni is the sister of Gopi.

8. **(b)**

$$\begin{matrix} \bullet & \bullet & \bullet & \bullet & \bullet \\ E & B & A & C & D \end{matrix}$$

Therefore, A is sitting in between B and C.

9.   (c)

Here the common faces with 4 dots are in same positions. Hence 2 will be opposite to 5.

10.   (d)

The relative speed of the two trains is 30 + 40 = 70 miles per hour. Therefore 1 hour before they meet, they must be 70 miles apart (in the final 1 hour they will cover 70 miles to meet).

11.   (c)

Let's suppose number of Lions, Rhinos, Antelopes and Zebras in the national park be a, b, c and d respectively.
Hence according to the first condition,

$$b + c + d = 191 \quad\quad\quad ...(i)$$
Similarly, $\quad\quad a + c + d = 178 \quad\quad\quad ...(ii)$
Also, $\quad\quad\quad a + b + d = 169 \quad\quad\quad ...(iii)$
And, $\quad\quad\quad a + b + c = 161 \quad\quad\quad ...(iv)$

Adding all the above four equations we will get,
$$\Rightarrow \quad 3(a + b + c + d) = 191 + 178 + 169 + 161$$
$$a + b + c + d = 233$$

12.   (d)

$$\text{Literate male population} = \left(\frac{64 \times 5}{8}\right) = 40\%$$
$$\text{Literate female population} = 24\%$$
$$\text{Now, illiterate population} = (100 - 64)\% = 36\%$$
$$\text{Illiterate males} = \left(\frac{36 \times 4}{9}\right) = 16\%$$
$$\text{Illiterate females} = 20\%$$
$$\text{Required percentage} = \left(\frac{16}{24}\right) \times 100 = 66.67\%$$

13.   (a)

Using statement I:
Let pipe C takes t hours to fill the tank, pipe A takes $3t$ hours and pipe B takes $1.5t$ hours.
At this stage, we have no more information to solve the question.
Hence, statement I is insufficient. Using the data given in the second statement.
Working together, they take 1 hour to fill the tank,
$$\frac{1}{t} + \frac{1}{3t} + \frac{1}{1.5t} = 1$$
$$t = 2 \text{ hours}$$
Thus pipe A takes 6 hours and pipe B takes 3 hours to fill the tank.
Working together, they take 2 hours to fill the tank.
Therefore, both statements are needed to get the answer.

14.   (c)

$$B - 3 = E \quad\quad\quad ...(i)$$
$$B + 3 = D \quad\quad\quad ...(ii)$$
$$A + B = D + E + 10 \quad\quad\quad ...(iii)$$
$$B = C + 2 \quad\quad\quad ...(iv)$$
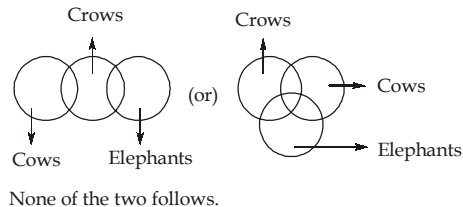$$A + B + C + D + E = 133 \quad\quad\quad ...(v)$$

From (i) and (ii), we have : $2B = D + E$ ...(vi)

From (iii) and (vi), we have : $A = B + 10$ ...(vii)

Using (iv), (vi) and (vii) in (v), we get:

$(B + 10) + B + (B – 2) + 2B = 133 \Rightarrow 5B = 125 \Rightarrow B = 25.$

15. (d)

None of the two follows.

16. (c)

The alphabetical order = CCHJL

Number of words starting with C = 4! = 24

Number of words starting with H = $\dfrac{4!}{2} = 12$

Number of words starting with J = $\dfrac{4!}{2} = 12$

Total words till now = 24 + 12 + 12 = 48

First word starting with L (49th in dictionary) = LCCHJ

Therefore, the 50th word = LCCJH

17. (d)

Any number ending in 7 when raised to a power will have the following pattern 7,9,3,1 as the units digit and any number ending in 2 when raised to a power will have the following pattern 2, 4, 8, 6 as the units digit.

Now 97^{275} means we divide 275 by 4 and compare it against the pattern 275th power will have 3 as the units digit.

32^{44} means we divide 44 by 4 and compare it against the pattern 44th power will have 6 as the units digit.

Thus we have 3 – 6. The trick is that you have to imagine the normal subtraction and get 1 as the carry over thus it is actually 13 – 6 = 7.

18. (b)

The plane cuts the cone at a height h/3 from the base as shown below.
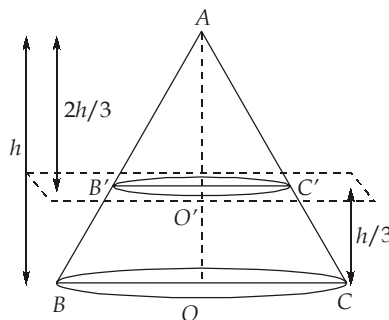
Let R be the radius of the base of the cone. Then, the volume of the original cone is $V = \pi R^2 h/3$

If we look at the figure, AO′B′ and AOB, we can see similar triangles.

We know AO′ = $\dfrac{2h}{3}$ and $AO = h$

Applying properties of similar triangles

$$\dfrac{O'B'}{OB} = \dfrac{AO'}{AO} = \dfrac{2h/3}{h} = \dfrac{2}{3}$$

$$OB = R$$

$$O'B' = \dfrac{2}{3}\,OB = \dfrac{2}{3}R$$

The height and the radius of the smaller cone are therefore, $\dfrac{2h}{3}$ and $\dfrac{2R}{3}$ respectively.

So its volume = $\dfrac{1}{3}\pi\left(\dfrac{2R}{3}\right)^2\dfrac{2h}{3} = \dfrac{8V}{27}$

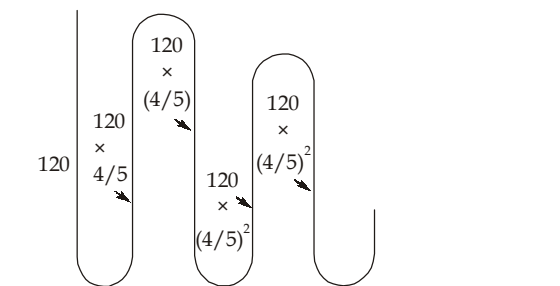Volume of the frustum = Total volume – volume of smaller cone

$$= \left(V - \dfrac{8V}{27}\right) = \dfrac{19V}{27}$$

Ratio of volume of smaller cone and frustum is = $\dfrac{8V}{27} : \dfrac{19V}{27}$ = 8 : 19

Therefore required ratio is 8 : 19.

19. (c)

Initial height = 120 m

Total distance

$$= 120 + 2 \times \left[120 \times \dfrac{4}{5} + 120 \times \left(\dfrac{4}{5}\right)^2 + 120 \times \left(\dfrac{4}{5}\right)^3 ...\right]$$

$$= 120 + 2 \times 120 \times \dfrac{4}{5}\left[1 + \left(\dfrac{4}{5}\right) + \left(\dfrac{4}{5}\right)^2 + ...\right]$$

$$= 120 + 192 \times \dfrac{1}{1 - \dfrac{4}{5}} = 120 + 192 \times 5 = 1080 \text{ meters}$$

20. (c)

Let the length of the middle sized piece is x cm.

Then, length of largest piece = $3x$ cm

Length of shortest piece = $(3x - 46)\,$cm

$$\Rightarrow \qquad 3x + x + 3x - 46 = 80$$
$$\Rightarrow \qquad 7x = 126$$
$$\Rightarrow \qquad x = 18$$

Length of the shortest piece = $3x - 46$
$$= 54 - 46 = 8 \text{ cm}$$

21. (a)

Initial price of a cow and a calf was Rs. 2000 and Rs. 1400.

After increment the price becomes Rs. 2400 and Rs. 1820.

Then the total cost are = $2400 \times 12 + 1820 \times 24$ = Rs. 72,480

22. (b)

Let, the cost price of 50 mangoes = Rs. x = selling price of 40 mangoes

$\therefore \qquad$ Cost price of one mango = Rs.$\dfrac{x}{50}$

Selling price of one mango = Rs.$\dfrac{x}{40}$

$$\text{Profit\%} = \frac{S.P. - C.P}{C.P} \times 100$$

$$= \frac{\dfrac{x}{40} - \dfrac{x}{50}}{\dfrac{x}{50}} \times 100 = \left(\frac{5}{4} - 1\right) \times 100 = 25\%$$

23. (b)

Time taken by both the pipes when they are opened simultaneously,

$$\Rightarrow \qquad \frac{1}{14} + \frac{1}{16} = \frac{1}{t_1}$$

$$t_1 = \frac{112}{15} \text{hrs}$$

Let's assume to leakage it will take t_2 hr to fill the tank

then, $\qquad t_2 = t_1 + \dfrac{32}{60} \text{hr}$

$$t_2 = \frac{112}{15} + \frac{8}{15} \text{hr}$$

$$t_2 = 8 \text{ hr}$$

If x is the rate of then leakage,

then

$$\Rightarrow \qquad \frac{1}{14} + \frac{1}{16} - \frac{1}{x} = \frac{1}{8}$$

$$\Rightarrow \qquad \frac{15}{112} - \frac{1}{x} = \frac{1}{8}$$

$$\Rightarrow \qquad \frac{1}{x} = \frac{15}{112} - \frac{1}{8}$$

$$\Rightarrow \qquad \frac{1}{x} = \frac{1}{112}$$

$$\Rightarrow \qquad x = 112 \text{ hr}$$

24. (c)

$$\text{Side of triangle } ABC = 2 \text{ cm}$$

$$\text{Area of triangle } ABC = \frac{\sqrt{3}}{4}(2)^2 = \sqrt{3} \text{ cm}^2$$

$$\text{Sector Area} = \left[\frac{\theta}{360°} \times \pi(1)^2\right] \times 3 = \frac{60°}{360°} \times \pi(1)^2 \times 3 = \frac{\pi}{2} \text{ cm}^2$$

$$\text{Hence, shaded area} = \left[\sqrt{3} - \frac{\pi}{2}\right] \text{ cm}^2$$

25. (b)

Given:

$$\frac{1}{\log_{xy}^{xyz}} + \frac{1}{\log_{yz}^{xyz}} + \frac{1}{\log_{zx}^{xyz}} = \log_{xyz}^{xy} + \log_{xyz}^{yz} + \log_{xyz}^{zx}$$

$$= \log_{xyz}^{(xy.yz.zx)}$$

$$= \log_{xyz}^{(xyz)^2} = 2$$

26. (d)

Total percentage of students who will be declared pass
$$= 13 + 12 + 6 + 8 = 39\%$$
Hence, total number of students who will be declared pass

$$= \frac{39}{100} \times 200 = 78$$

27. (c)

Series follows the pattern,

$$a_{n+1} = a_n \times a_{n+2}$$
$$a_2 = 4 = 2 \times 2$$
$$a_3 = 2 = 4 \times 0.5$$
$$a_4 = 0.5 = 2 \times 0.25$$
$$a_5 = 0.25 = 0.5 \times 0.5$$
$$a_6 = 0.5 = 0.25 \times x$$

$$\Rightarrow \qquad x = \frac{0.5}{0.25} = 2$$

28. (b)

$$x + \frac{1}{x} = 2$$

$$\Rightarrow \qquad x^2 + \frac{1}{x^2} + 2 = 4$$

$$\Rightarrow \qquad x^2 + \frac{1}{x^2} = 2$$

$$\Rightarrow \qquad x^4 + \frac{1}{x^4} + 2 = 4$$

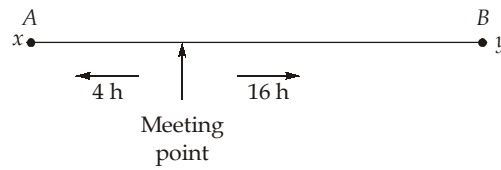$$\Rightarrow \qquad x^4 + \frac{1}{x^4} = 2$$

29. (d)

$$\frac{2.32^3 + 1.44^3 + 2.88^3 - 3 \times 2.32 \times 1.44 \times 2.88}{2.32^2 + 1.44^2 + 4 \times 1.44^2 - 2 \times 1.44^2 - 2.32 \times 1.44 - 2.32 \times 2.88}$$

$$\frac{2.32^3 + 1.44^3 + 2.88^3 - 3 \times 2.32 \times 1.44 \times 2.88}{2.32^2 + 1.44^2 + 2.88^2 - 2.88 \times 1.44 - 2.32 \times 1.44 - 2.32 \times 2.88}$$

$$\Rightarrow \qquad \frac{a^3 + b^3 + c^3 - 3abc}{a^2 + b^2 + c^2 - ab - bc - ca} = a + b + c$$

$$2.32 + 1.44 + 2.88 = 6.64$$

30. (a)

In this case,

$$\frac{S_1}{S_2} = \frac{\sqrt{T_2}}{\sqrt{T_1}}$$

$$\frac{40}{S_2} = \frac{\sqrt{4}}{\sqrt{16}}$$

$$S_2 = 80 \text{ kmph}$$

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