MADE EASY

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REASONING AND APTITUDE

ELECTRONICS ENGINEERING

Date of Test : 16/08/2024

ANSWER KEY ➤

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

DETAILED EXPLANATIONS

1. (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,

$$b + c + d = 191 \qquad \text{... (i)}$$

Similarly,

$$a + c + d = 178 \qquad \text{... (ii)}$$

Also,

$$a + b + d = 169 \qquad \text{... (iii)}$$

And,

$$a + b + c = 161 \qquad \text{... (iv)}$$

Adding all the above four equations we will get,

$$\Rightarrow \qquad 3(a + b + c + d) = 191 + 178 + 169 + 161$$
$$a + b + c + d = 233$$

2. (b)

The series is:

$$2^3 + 1^2 = 9 \qquad 3^3 + 2^2 = 31$$
$$4^3 + 3^2 = 73 \qquad 5^3 + 4^2 = 141$$
$$6^3 + 5^2 = 241$$

3. (c)

Let father's present age in case the father did not die be x years.

Then 3 years ago, it would have been $(x - 3)$ years and 12 years ago, it would have been $(x - 12)$ years. At the time of death of Sumit's father, average age of the family of 6 members was 26 years. So, total age of the family at that time = 26 × 6 = 156 years.

12 years ago, that is 9 years before the death of his father, total age of these 6 members will get reduced by 9 × 6 = 54.

So, total age of the family excluding his father 12 years ago from now = 156 – 54 = 102

Average age of the family 12 years ago = (Age of father + Total age of other members)/7 = 28

So,

$$\frac{\left[(x - 12) + 102\right]}{7} = 28$$

On solving this we get, $x = 106$ years

This would have been Sumit's father present age. He died three years ago, so at the time of his death, Sumit's father's age would have been 106 – 3 = 103 years.

4. (d)

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

5.   (a)

Let the cost of bike be ₹100,

then,   The cost of accessories = ₹25

So, the total cost of bike with accessories = ₹125

Now,   The new cost of bike = ₹140

and   The new cost of accessories = ₹10

Therefore, the new cost of bike with accessories = ₹150

Percentage change in cost of bike with accessories = $\left(\dfrac{25}{125}\right) \times 100 = 20\%$

6.   (a)

$$\text{Amount due in 3 years } = 3P$$
$$\text{Simple Interest } = 3P - P = 2P$$

$$\text{Time } = \dfrac{SI \times 100}{P \times R}$$

$$\dfrac{2P \times 100}{P \times 16} = \dfrac{25}{2} = 12\dfrac{1}{2} \text{ years}$$

7.   (b)

According to the question, "Amit can give a head start of 20 meter to Bishan in a race of 100 meters and still both finish the race at the same time".

Hence ratio of speeds of

$$\text{Amit : Bishan } = 100 : 80 = 5 : 4 \qquad\qquad\qquad ... \text{(i)}$$

Similarly,   Bishan : Chandan = 100 : 75 = 4 : 3   ... (ii)

From (i) and (ii) we will get;

$$\text{Amit : Chandan } = 5 : 3$$

It means when Amit can run 5 meters then in the same time Chandan can run 3 meters.

Or when Amit can run 100 m then Chandan can only run 60 m.

Hence it is clear that Amit can give a head start of 40 m to Chandan.

8.   (a)

Prateek and Urvashi together in 1 day do

$$\dfrac{1}{10} + \dfrac{1}{15} = \dfrac{1}{6} \text{ part of the work.}$$

Prateek and Urvashi together completed $\dfrac{4}{6}$ or $\dfrac{2}{3}$ part of the work.

At last Urvashi does the work for 2 days, Urvashi does $\dfrac{2}{15}$ part of the work.

Amount of work done by Shashank $= 1 - \left(\dfrac{2}{15} + \dfrac{2}{3}\right) = \dfrac{1}{5}$ part of the work = 0.2 part of the work.

9. **(d)**

Let the length be a and breadth be b

$$a = 2b$$

$$\frac{ab}{2(a+b)} = \frac{10}{3}$$

$$a = 20 \text{ m}, \quad b = 10 \text{ m}$$

Cost of fencing along the length = ₹15 per meter.

Net cost of fencing along the total length = 40 × 15 = ₹600

Net cost of fencing along the total breadth = 20 × 30 = ₹600

$$\text{Total cost} = ₹1200$$

10. **(d)**

1st card can be drawn in 12 out of 52 ways (4 Ace, 4 King and 4 Queen). 2nd card can be drawn in 5 out of 51 ways. Suppose Diamond Ace is picked as a first card, then we have choices for Heart Ace, 2 Kings and Queens, so total 5 choices out of 51 cards.

3rd card can be drawn in 4 out of 50 ways.

Hence, probability that all three cards are Ace, King or Queen of same color

$$= \frac{12}{52} \times \frac{5}{51} \times \frac{4}{50} = \frac{2}{1105}$$

Hence, option (d).

11. **(c)**

$$v = d/t$$

$$v + 8 = \frac{250}{15} \times \frac{18}{5}$$

$$v = 52 \text{ km/hr}$$

12. **(d)**

Let x, y, z, w be the inlet pipes

$$\frac{1}{x} + \frac{1}{y} + \frac{1}{z} = \frac{1}{24}$$

$$\frac{1}{y} + \frac{1}{z} + \frac{1}{w} = \frac{1}{30}$$

$$\frac{1}{x} + \frac{1}{w} = \frac{1}{40}$$

Adding the 3 equations,

$$2\left(\frac{1}{x} + \frac{1}{y} + \frac{1}{z} + \frac{1}{w}\right) = \frac{1}{24} + \frac{1}{30} + \frac{1}{40} = \frac{12}{120} = \frac{1}{10}$$

$$\frac{1}{x} + \frac{1}{y} + \frac{1}{z} + \frac{1}{w} = \frac{1}{20}$$

$$\frac{1}{y} + \frac{1}{z} = \frac{1}{20} - \left(\frac{1}{x} + \frac{1}{w}\right) = \frac{1}{20} - \frac{1}{40} = \frac{1}{40}$$

So second and third pipes together can fill the tank in 40 minutes.

13. **(a)**

$$\text{Volume of the cylinder} = \frac{22}{7} \times 7 \times 7 \times 20 = 3080 \, \text{cm}^3$$

$$\text{Volume of the liquid} = 3080 \times 0.9 = 2772 \, \text{cm}^3$$

$$15 \times 8 \times h = 2772$$

$$h = 23.1 \, \text{cm}$$

14. **(d)**

No such case would exist such that after putting twenty nine letters in proper envelope, 30$^{\text{th}}$ letter is placed in a wrong envelope. Thus, the probability of such an event is zero.

15. **(b)**

$$A = \frac{a+b}{2}, \qquad G = \sqrt{ab},$$

$$H = \frac{2ab}{a+b}$$

$$A \times H = \frac{a+b}{2} \times \frac{2ab}{a+b} = ab = G^2$$

$\Rightarrow$ G is geometric mean between A and H.

16. **(c)**

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

17. **(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.

18. **(b)**

From equation I:

$$50x^2 + 20x - 48 = 25x^2 + 10x - 24 = (5x+6)(5x-4) = 0$$

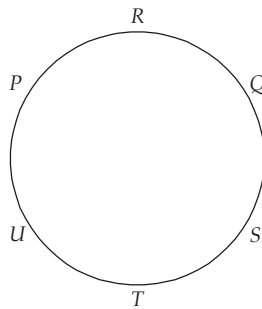$$\Rightarrow \qquad x = -\frac{6}{5}, \frac{4}{5}$$

From equation II:

$$y^2 + 42y + 437 = (y+23)(y+19) = 0$$

$$\Rightarrow \qquad y = -23, -19$$

So, $x > y$

	$x = -\dfrac{6}{5}$	$x = \dfrac{4}{5}$
$y = -23$	$x > y$	$x > y$
$y = -19$	$x > y$	$x > y$

19. (d)

20. (d)

If T is son, then it has to be male; (a) and (b) suggest T is a female; while (c) does not tell us whether T is a male or female. Therefore, as per (d) T is brother of S where T and S are children of Q and R, which implies T is son of Q. Hence, option (d).

21. (c)

The arrangement of five instruments is given below:
From top to bottom: E-A-B-C-D

22. (d)

From I: Qasim > Preeti > Tamanna or Qasim> Tamanna > Preeti
From II: Rashmi > Sushil > Urvashi > Qasim or Sushil > Rashmi > Urvashi > Qasim
From III: Rashmi > Tamanna, but Rashmi is not the tallest
From I, II and III: Sushil > Rashmi > Urvashi > Qasim > Tamanna > Preeti
or Sushil > Rashmi > Urvashi > Qasim > Preeti > Tamanna
Sushil is the tallest.

23. (d)

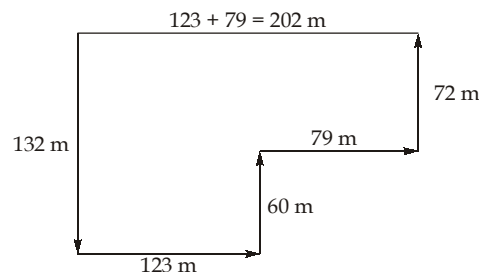Since Sonal and Meena exchange places, so Sonal's new position is same as Meena's earlier position. This position is 16th from the right and 9th from the left.
Therefore number of girls in the row
$$= (15 + 1 + 8) = 24$$

24. (c)

Following path can be traced

He is in East direction and 202 m away from the starting point.

25. (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, $$x = ₹30$$

26. (d)

a = Sum of an arithmetic sequence with first term, 15 and last term, 35 and common difference 2.

Number of odd numbers from 15 to 35, $n = \dfrac{(35-15)}{2} + 1 = 11$

$a = \dfrac{11}{2}(15+35) = 275$

b = number of even integers from 16 to 34 inclusive $= \dfrac{(34-16)}{2} + 1 = 10$

Therefore, $a - b = 265$

27. (a)

If these four lines are parallel, then we'll have 0 vertices.

If no two of the four are parallel, then each distinct pair of lines will give a vertex, thus total of $^4C_2$ = 6 vertices.

28. (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).

29. (c)

In a regular hexagon three diagonals pass through the centre.

G is the centre making the total number of points = 7.

To form a triangle, we need 3 points at a time.

Therefore, total number of possible triangles = $^7C_3 = 35$

But since three diagonals pass through the centre, G will be collinear in three cases.

Therefore total number of triangles that can be formed using vertices from amongst these 7 points = 35 – 3 = 32.

30. (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.

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