CLASS TEST

S.No. : 02SKCS_I+J+K+L_16112024

MADE EASY

India's Best Institute for IES, GATE & PSUs

Delhi | Bhopal | Hyderabad | Jaipur | Pune | Kolkata

Web: www.madeeasy.in | **E-mail:** info@madeeasy.in | **Ph:** 011-45124612

REASONING AND APTITUDE

COMPUTER SCIENCE & IT

Date of Test : 16/11/2024

ANSWER KEY ➤

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

DETAILED EXPLANATIONS

1. (c)

As code must include all the three letters then pattern of the code word is *ABCX* where *X* can be any letter out of *A*, *B*, and *C*. So we can have the code word consisting of letters:

ABCA;

ABCB;

ABCC.

We can arrange letters in each of above 3 cases in $\frac{4!}{2!}$ number of ways (as each case has 4 letters out of which one is repeated twice), so total number of code words is $3 \times \frac{4!}{2!} = 36$.

2. (d)

Initial solution is "half water/half alcohol mix" means it's 50% (0.5) alcohol solution.

Let the portion replaced be x and the volume of initial solution be 1 unit.

Then the amount of alcohol after removal of a portion will be $0.5 (1 - x)$ and the amount of alcohol added will be $\mathbf{0.25}x$, so total amount of alcohol will be $(1 - x) + 0.25x$. On the other hand as in the end 30% alcohol solution was obtained then the amount of alcohol in the end was 0.3×1.

So $0.5 (1 - x) + 0.25x = 0.3 \Rightarrow x = 0.8$, or 80%.

3. (c)

Let the number of children in the lift is x

Now, $$\frac{6}{18} + \frac{10}{24} + \frac{x}{32} = 1$$

$$\frac{x}{32} = 1 - \frac{1}{3} - \frac{5}{12}$$

Maximum number of children that can board the lift $x = \frac{32}{4} = 8$ children

4. (b)

A careful look will tell you that each subsequent term is made by multiplying the digits of the number i.e. 77 is followed by $7 \times 7 = 49$ which is followed by $4 \times 9 = 36$ and that leads us to the next number being $3 \times 6 = 18$.

5. (d)

In this coding language, the letters are written such that one letter from right end followed by one letter from left end.

DISTANCE = EDCINSAT

ACQUIRE = EARCIQU

6. (d)

$$\text{Literate male population} = \left(\frac{64 \times 5}{8}\right) = 40\%$$

$$\text{Literate female population} = 24\%$$

$$\text{Now, illiterate population} = (100 - 64)\% = 36\%$$

© Copyright: MADE EASY

$$\text{Illiterate males} = \left(\frac{36\times 4}{9}\right) = 16\%$$

$$\text{Illiterate females} = 20\%$$

$$\text{Required percentage} = \left(\frac{16}{24}\right)\times 100 = 66.67\%$$

7. (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

Total cost = ₹1200

8. (d)

From the given data of Table-1 and Table-2,

$$\therefore \quad 12.5\% \text{ of } 15\% \text{ of total} = 4800$$

$$\frac{12.5}{100}\times\frac{15}{100}\times \text{Total} = 4800$$

$$\text{Total} = 4800\times\frac{100}{12.5}\times\frac{100}{15} = 256000$$

Now, from table-1,

$$\text{Admissions in kerala} = 11\% \text{ of Total}$$

$$= \frac{11}{100}\times 256000 = 28160$$

9. (c)

Since there is no profit no loss

$$\Rightarrow \quad 5k + 3k = 1600$$

$$k = 200$$

$$\Rightarrow \quad \text{cost price of table} = 5 \times 200 = ₹\ 1000$$

$$\Rightarrow \quad \text{cost price of chair} = 3 \times 200 = ₹\ 600$$

Now,

$$1000\times\left(\frac{100-x}{100}\right)+600\left(\frac{100+y}{100}\right) = 1600$$

$$1000 - 10x + 600 + 6y = 1600$$

$$10x = 6y$$

$$\frac{x}{y} = \frac{6}{10} = \frac{3}{5}$$

Only the values given in option (c) satisfy this ratio.

10. (d)

In this coding language, the letters are written such that one letter from right end followed by one letter from left end.

DISTANCE = EDCINSAT

ACQUIRE = AERCIQU

11. (b)

Since the two semi circles are congruent, they intersect at the top of the arc.

We can divide this into 3 regions

I. A quarter circle with radius 2 (Area = $\frac{\pi \times 2 \times 2}{4} = \pi$)

II. A square with side 2 (Area = 2 × 2 = 4)

III. Another quarter circle with radius 2 (Area = $\frac{x \times 2 \times 2}{4} = \pi$)

Total = 4 × 4 = 16

Shaded Area = Total Area – I – II – III

$\therefore$ Shaded Area = 16 – π – 4 – π = 12 – 2π

12. (b)

C1 – P5 – SUN

C2 – P3 – TUE

The sequence of programs based on channels is C7-C3-C4-C6

Since neither C7 nor C3 telecasts on MON, the only channel left is C5 which telecasts a program on MON.

P1 is followed by P6 and C4 telecasts neither P1 nor P6 implies that C4 telecasts P4 and the days for C7-C3-C4-C6 are Wed/THU/FRI/SAT.

13. (b)

Given, $3^a = 4$, means $4^b = (3^a)^b = 3^{ab}$; likewise keep replacing successive values.

We will end up getting $3^{abcdef} = 9 = 3^2$ or $abcdef = 2$.

14. (d)

Let equal sides of the isosceles triangle be x,

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

$x = 5\sqrt{2}$ cm

So, $\text{Final area} = 8 \times \left(\frac{1}{8} \times \pi \times 10^2 - \frac{1}{2} 5\sqrt{2} \times 5\sqrt{2}\right)$

$= \pi \times 10^2 - 4 \times 25 \times 2$

$= 100\pi - 200$

Area = 114.16 cm^2

© Copyright: MADE EASY

15. (d)

$$\frac{2.32^3+1.44^3+2.88^3-3\times2.32\times1.44\times2.88}{2.32^2+1.44^2+4\times1.44^2-2\times1.44^2-2.32\times1.44-2.32\times2.88}$$

$$\frac{2.32^3+1.44^3+2.88^3-3\times2.32\times1.44\times2.88}{2.32^2+1.44^2+2.88^2-2.88\times1.44-2.32\times1.44-2.32\times2.88}$$

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

$$2.32 + 1.44 + 2.88 = 6.64$$

16. (c)

$$\frac{\alpha}{\beta}+\frac{\beta}{\alpha} = \frac{\alpha^2+\beta^2}{\alpha\beta} = \frac{(\alpha+\beta)^2-2\alpha\beta}{\alpha\beta} = \frac{(\alpha+\beta)^2}{\alpha\beta}-2$$

$$= \frac{(12/8)^2}{a/8}-2 = \frac{144}{8a}-2 = \frac{18}{a}-2$$

Minimum value = –2 (When $a \to \infty$)

17. (a)

$$\text{Volume of the cylinder} = \frac{22}{7}\times7\times7\times20 = 3080\,\text{cm}^3$$

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

$15 \times 8 \times h = 2772$

$h = 23.1$ cm

18. (b)

From equation I:

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

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

From equation II:

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

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

So, $x > y$

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

19. (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

$= (15 + 1 + 8) = 24$

20. (a)

Let the least amount of wages be ₹x

$x + (x + 20) + (x + 40) + (x + 60) = 4 \times 60$

or, $4x + 120 = 240$

$4x = 240 - 120 = 120$

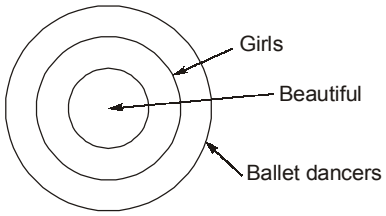
Therefore, $x =$ ₹30

21. (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.

22. (d)

We can represent the given statements as shown:



A look at the diagram drawn leads us to conclude that "All ballet dancers are beautiful." which is C1. Likewise, we can also conclude that though all ballet dancers are girls but NOT ALL girls are ballet dancers implying C2 is also a valid conclusion; leading us to option 'd'

23. (d)

Number of odd days in one ordinary year = 1
Number of odd days in one leap year = 2
Counting the number of odd days from the year 2007 onwards as follows:

Year	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Odd day	1	2	1	1	1	2	1	1	1	2	1	1

By taking the total odd days accumulated from 2007 to 2017, we get,
$1 + 2 + 1 + 1 + 1 + 2 + 1 + 1 + 1 + 2 + 1 = 14 = 2 \times 7 \Rightarrow$ equivalent to "0" odd days.
As 2018 is ordinary year like 2007, both will have same calender.

24. (b)

Let P, Q and R represent their respective monthly income. Then, we have:

$$P + Q = (5050 \times 2) = 10100 \quad ...(i)$$
$$Q + R = (6250 \times 2) = 12500 \quad ...(ii)$$
$$P + R = (5200 \times 2) = 10400 \quad ...(iii)$$

Adding (i), (ii) and (iii),
we get: $2(P + Q + R) = 33000$
$\Rightarrow$ $P + Q + R = 16500 \quad (iv)$
Subtracting (ii) from (iv), we get,
$P = 4000$
$\therefore$ P's monthly income = ₹ 4000

25. (c)

Option (c) is the converse of S1. Since ONLY students can participate in the race, it implies that ALL participants in the race are students.
S3 negates option (a) as well as (b) since ONLY girls are invited for coaching.

© Copyright: MADE EASY

26. (b)

$$P = \frac{3}{2}\times\frac{4}{3}\times\frac{5}{4}\times\frac{6}{5}\times\_\_\_\_\_\frac{99}{98}\times\frac{100}{99}$$

$$= \frac{100}{2} = 50$$

$$Q = \frac{1}{2}\times\frac{2}{3}\times\frac{3}{4}\times\_\_\_\_\_\frac{98}{99}\times\frac{99}{100} = \frac{1}{100}$$

$$\frac{P}{Q} = 5000$$

27. (b)

Given $A^2 = 2002 + B$

$B^2 = 2002 + A$

We can write, $A^2 - B^2 = B - A$

$(A + B)(A - B) = B - A$

$A + B = -1$

since $A \neq B$

$A^2 + B^2 = 4004 + A + B = 4003$

$(A + B)^2 = A^2 + B^2 + 2AB$

Which leads to, $2AB = 1 - 4003 = -4002$ or $AB = -2001$

28. (c)

The trains starts at 6:00 AM , 7:00 AM, 8:00 AM.... from both the stations

The trains reach at 10:30 AM, 11:30 AM, 12:30 PM

The train which starts at 12 PM from Mumbai will reach the pune by 4 : 30 PM. This train first meets a train moving towards Mumbai to reach the destination by 12:30 PM, which started in Pune at 8:00 AM.

The train crosses the trains which starts from Pune between 8:00 AM and 4:30 PM.

$\Rightarrow$ Total number of trains is 9.

29. (b)

The angle traversed by hour hand

$= 6 \times 30° + 15° = 195°$

The angle traversed by minute hand

$= 6 \times 360° + 180° = 2340°$

$$\text{Ratio} = \frac{2340}{195} = 12$$

30. (d)

$95 + 20.5 = 115.5$

$115.5 + 22.5 = 138$

$138 + 24.5 = 162.5$

$162.5 + 26.5 = 189$

■■■■