



UNIFIED COUNCIL

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UNIFIED CYBER OLYMPIAD - UC 329

Solutions for class : 7

Mental Ability

1. (A) Cost of $5\frac{2}{5}$ litres of milk = ₹ $101\frac{1}{4}$

⇒ Cost of 1 litre of milk

$$= ₹ \left(\frac{405}{4} \div \frac{27}{5} \right) = ₹ \left(\frac{405}{4} \times \frac{5}{27} \right)$$

Hence, the cost of milk is

$$₹ 18\frac{3}{4} \text{ per litre.}$$

2. (C) Let the cost of air conditioner be x .

Profit on sales of first type air conditioner = 20%

Sales price of first type air conditioner = 30000

$$\text{So, } \frac{120}{100} \times x = 30000$$

$$x = \frac{30000 \times 100}{120} = 25000$$

Loss on sales of second type air conditioner = 25%

$$\text{So, } \frac{75}{100} \times x = 30000$$

$$x = \frac{30000 \times 100}{75} = 40000$$

Total cost price = $25000 + 40000 = 65000$

Total sell = $2 \times 30400 = 60800$

Gain/Loss = $60000 - 65000 = -5000$

3. (A) Let the son's present age be x years. Then the father's age is $(26 + x)$ years.

In 3 years' time, son's age = $(x + 3)$ years and father's age = $(26 + x + 3)$ years = $(x + 29)$ years.

$$\Rightarrow x + 3 = \frac{1}{3}(x + 29) \Rightarrow x = 10$$

∴ The present age of the son is 10 years.

4. (B) $EF \parallel AD$, let AC be the transversal.

$$\therefore x + 152^\circ = 180^\circ$$

$$\Rightarrow x = 180^\circ - 152^\circ = 28^\circ$$

In $\triangle BGE$, $\angle BGE = 180^\circ - 152^\circ = 28^\circ$

$$\therefore y = \angle BEG + \angle BGE$$

[Exterior angle is sum of its two interior opposite angles]

$$y = 28^\circ + 104^\circ$$

$$y = 132^\circ$$

5. (B) Given, $S_n = \frac{n}{2} \{2a + (n - 1)d\}$

Here, $n = 10$, $a = 6$ and $d = 4$

$$\therefore S_{10} = \frac{10}{2} \{2 \times 6 + (10 - 1) 4\} = 5 \{12 + 36\}$$

$$= 240$$

6. (B) It has 6 lines of symmetry.

7. (B) By the given statement in question,

$$\text{Perimeter} = 2(2w) + 2(w) = 4w + 2w = 6w$$

Where, w is the width of the rectangle in inches.

8. (C) Let $\frac{1}{3} + \frac{1}{5} = A$ and $\frac{1}{3} + \frac{1}{5} + \frac{1}{7} = B$

According to the question, we have

$$\begin{aligned} (1+A)B - (1+B)A \\ = B + AB - A - AB \\ = B - A \end{aligned}$$

$$\left(\frac{1}{3} + \frac{1}{5} + \frac{1}{7}\right) - \left(\frac{1}{3} + \frac{1}{5}\right) = \frac{1}{7}$$

9. (A) If the three angles of a triangle are congruent to corresponding angles of the other, it is an enlarged copy of the triangle.

10. (B) Given, $C = \frac{AY}{Y+15}$

Here, $A = 50$ g and $Y = 10$ Yr

$$\therefore C = \frac{50 \times 10}{10 + 15} = \frac{500}{25} = 20 \text{ g}$$

11. (B) Given,

Number of sweaters bought = 4

and cost of 1 sweater = x

Cost of 4 sweaters = $4x$

Now, number of skirts bought = 1

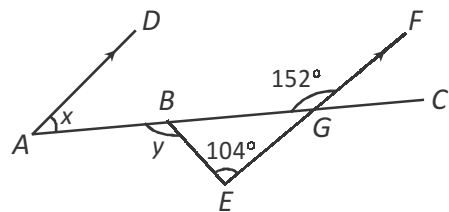
Cost of 1 skirt = ₹ 20

Total cost of = $4x + 20$

According to the question,

$$4x + 20 = 160$$

12. (B)



In the above figure,

$$EF \parallel AD$$

$$\angle BEG = 104^\circ$$

$$\angle BGF = 152^\circ$$

Now, $AD \parallel GF$

$$\Rightarrow \angle x + 150^\circ = 180^\circ$$

[Interior angles on the same side of a transversal are supplementary]

$$\therefore \angle x = 180^\circ - 152^\circ = 28^\circ$$

Also, $\angle AGF + \angle AGE = 180^\circ$ [linear pair]

$$\therefore 152^\circ + \angle AGE = 180^\circ$$

$$\angle AGE = 180^\circ - 152^\circ = 28^\circ$$

Now, in $\triangle BEG$

$$\Rightarrow \angle BEG + \angle BGE = \angle y$$

[exterior angle is equal to the sum of interior opposite angles]

$$\therefore \angle y = 104^\circ + 28^\circ = 132^\circ$$

13. (D) Consider $\triangle DCB$,

$$\angle a + \angle b + \angle DCB = 180^\circ$$

$$\Rightarrow \angle a + \angle b + 63^\circ = 180^\circ$$

$$\Rightarrow \angle a + \angle b = 117^\circ$$

Also, $\angle b = 63^\circ$ [DC = DB]

$$\Rightarrow \angle a = 54^\circ$$

In $\triangle DAB$, $DB = DA$

$$\Rightarrow \angle d = \angle BAD$$

$$\Rightarrow \angle d = 63^\circ$$

$$\therefore \angle e = 54^\circ$$

Also, $CB \parallel FA$

$$\Rightarrow \angle d = \angle g$$

$$\Rightarrow \angle g = 63^\circ$$

Also, $DF = DE$

$$\Rightarrow \angle g = \angle h$$

$$\therefore \angle h = 63^\circ$$

In $\triangle DFE$,

$$\angle f + \angle g + \angle h = 180^\circ$$

$$\Rightarrow \angle f + 63^\circ + 63^\circ = 180^\circ$$

$$\Rightarrow \angle f + 54^\circ$$

Now, $\angle CDF + \angle CDB = 180^\circ$ [linear pair]

$$\Rightarrow \angle CDF + 54^\circ = 180^\circ$$

$$\Rightarrow \angle CDF = 126^\circ$$

Similarly,

$$\angle e + \angle f + \angle ADE = 180^\circ$$
 [linear pair]

$$\Rightarrow 54^\circ + 54^\circ + \angle ADE = 180^\circ$$

$$\Rightarrow \angle ADE = 72^\circ$$

$$\therefore \angle CDF + \angle ADE = 126^\circ + 72^\circ = 198^\circ$$

14. (C) Consider $\frac{(2h^2j^2k^{-2} \times h^{-4}j^{-1}k^4)^0}{2h^{-3}j^{-4}k^{-2}}$

We know that, $a^0 = 1$

Numerator = 1

Denominator = $2h^{-3}j^{-4}k^{-2}$

So, we have $\frac{1}{2h^{-3}j^{-4}k^{-2}} = \frac{h^3j^4k^2}{2}$

$$\left[\therefore a^{-m} = \frac{1}{a^m} \right]$$

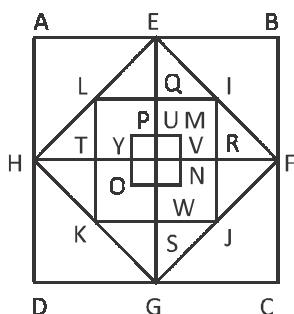
15. (A) Let first number be x and second number be y and let second number be reduced by k % so

$$xy = \left[x + \frac{40}{100}x \right] (y - ky)$$

$$\therefore k\% = 28\frac{4}{7}\%$$

Reasoning

16. (C) On labelling the figure, we get



The number of squares composed of one unit are

\square PUXY, \square UMXV, \square XVNW, \square YXWO, i.e. 4.

The number of squares composed of two units are \square LQXT, \square QIRX, \square XRJS and \square TXSK i.e. 4.

The number of squares composed of three units are \square EBFX, \square XFCG, \square HXGD and \square AEXH, i.e. 4.

The number of squares composed of more than three units are \square PMNO, \square LIJK, \square EFGH and \square ABCD, i.e. 4.

Thus, the total number of squares

$$= 4 + 4 + 4 + 4 = 16$$

Hence, option (C) is correct.

17. (B) The inner design is enlarged and becomes outer design and the outer design is reduced and becomes inner design with shade. On following this pattern, option (B) will complete the second pair.

Hence, option (B) is correct.

18. (A) Here, the triangle and rectangle are moving one step in clockwise direction and the dot and square are moving one step in anti-clockwise direction to get the next figure. On following this pattern, option (A) will come next.

Hence, option (A) is correct.

19. (D) All the figures except option (D) are same when rotated. But option (D) does not have same pattern as others.

So, option option (D) is odd one out.

Hence, option (D) is correct.

20. (C) The correct water image of the given object is



Hence, option (C) is correct.

21. (D) Number '6' is common in both positions of the dice. Now, the adjacent faces of '6' are 1, 2, 3 and 4.

So, the remaining number, i.e. '5' will be opposite to number '6'.

Hence, option (D) is correct.

22. (B) The whole figure gets laterally inverted and the symbols interchange their respective positions. On following this pattern, option (B) will complete the second pair.

Hence, option (B) is correct.

23. (D) Pairs of opposite faces are (\square and \square), (\square and \square) and (\square and \square). Here, all the four cubes can be formed from the given net because no opposite faces are shown adjacent to each other in these cubes.

Hence, option (D) is correct.

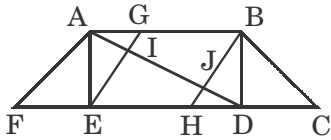
24. (D) Here, in all the figures except option (D), the inner and outer figures are same. So, option (D) is odd one out.

Hence, option (D) is correct.

25. (C) Here, in the row, the figure is rotating 45° clockwise and in the column, the figure is rotating 135° clockwise in each step. On following this pattern, option (C) will complete the matrix.

Hence, option (C) is correct.

26. (A) On labelling the figure, we get



The number of triangles composed of one unit are $\triangle AEF$, $\triangle AIE$, $\triangle AGI$, $\triangle JHD$, $\triangle JBD$ and $\triangle BCD$, i.e., 6. The number of triangles composed of two units are $\triangle AGE$, $\triangle BHD$, $\triangle ABJ$ and $\triangle IED$ i.e. 4. The number of triangles composed of more than two units are $\triangle AED$, i.e., 4. Thus, the total number of triangles

$$= 6 + 4 + 4 = 14$$

Hence, option (A) is correct.

27. (D) The face having 5 dots appears in both the positions. Clearly, the faces having 4, 3, 1 and 2 dots are adjacent to the face having 5 dots. So, the face having 6 dots will be opposite to the face having 5 dots.

Hence, option (D) is correct.

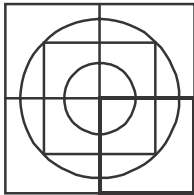
28. (C) Pairs of opposite faces are (A and B), (D and E) and (C and F). Here, 'D' is opposite to E. So, the face having 'E' is at the bottom of the cube.

Hence, option (C) is correct.

29. (B) Here, all the figures except figure (B), are same when rotated. So, option (B) is odd one out.

Hence, option (B) is correct.

30. (C) The grid can be completed as



Hence, option (C) is correct.

Computers

- 31. (A)
- 32. (C)
- 33. (C)
- 34. (B)
- 35. (C)
- 36. (A)
- 37. (A)
- 38. (B)
- 39. (B)
- 40. (A)
- 41. (D)
- 42. (D)
- 43. (B)
- 44. (C)
- 45. (A)

English

- 46. (C)
- 47. (D)
- 48. (C)
- 49. (D)
- 50. (D)