



UNIFIED COUNCIL

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UNIFIED CYBER OLYMPIAD - UC 329

Solutions for class : 6

Mental Ability

- (C) If $M > N \Rightarrow M + 0 > N + 0$
- (C) We work from right to left as we would if doing this calculation by hand.

In the units column, we have $L - 1$ giving 1. Thus, $L = 2$. (There is no borrowing required.)

In the tens column, we have $3 - N$ giving 5.

Since 5 is larger than 3, we must borrow from the hundreds column. Thus, $13 - N$ gives 5, which means $N = 8$. This gives

$$\begin{array}{r} \text{K-1} \quad 13 \\ 5 \quad \cancel{K} \quad \cancel{3} \quad 2 \\ - M \quad 4 \quad 8 \quad 1 \\ \hline 4 \quad 4 \quad 5 \quad 1 \end{array}$$

In the hundreds column, we have $(K - 1) - 4$ giving 4, which means $K = 9$. This gives

$$\begin{array}{r} 5 \quad 9 \quad 3 \quad 2 \\ - M \quad 4 \quad 8 \quad 1 \\ \hline 4 \quad 4 \quad 5 \quad 1 \end{array}$$

In the thousands column, we have 5 (with nothing borrowed) minus M giving 4.

Thus, $5 - M = 4$ or $M = 1$.

This gives $5932 - 1481 = 4451$, which is correct.

Finally, $K + L + M + N = 9 + 2 + 1 + 8 = 20$.

- (A) Let star fish be denoted by S and gold fish by G .

$$\therefore S : G = 3 : 7$$

$$\Rightarrow S = \frac{3}{7}G$$

$$\text{We have, } \frac{S}{G+25} = \frac{6}{19}$$

$$\Rightarrow 19S = 6G + 150$$

$$\Rightarrow 19 \times \frac{3}{7}G = 6G + 150$$

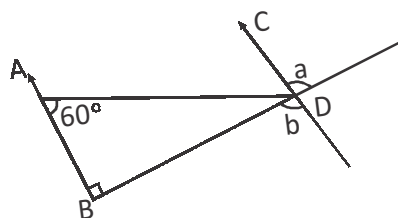
$$\Rightarrow 57G = 42G + 150 \times 7$$

$$\Rightarrow 15G = 150 \times 7$$

$$\Rightarrow G = 70$$

$$\therefore S = \frac{3}{7} \times 70 = 30$$

- (D)



Given, $AB \parallel CD$

$$\therefore \angle ABD + \angle CDB = 180^\circ$$

[angles on same side of transversal]

$$\therefore \angle CDB = 90^\circ$$

$$[\angle ABD = 90^\circ]$$

$$\text{Now, } \angle a + \angle CDB = 180^\circ \quad [\text{linear pair}]$$

$$\therefore \angle a + 90^\circ = 180^\circ$$

$$\therefore \angle a + 90^\circ$$

Also, $\angle a + \angle b$

[\square vertically opposite angles]

$$\therefore \angle a + \angle b = 90^\circ + 90^\circ$$

$$= 180^\circ$$

5. (A) Consider $\left(\frac{2}{3} \text{ of } 16\right) - \left(\frac{1}{18} \div \frac{1}{3}\right)$

$$\Rightarrow \left(\frac{2}{3} \times 16\right) - \left(\frac{1}{18} \times 3\right)$$

$$\Rightarrow \left(\frac{32}{3}\right) - \left(\frac{1}{6}\right)$$

$$\Rightarrow \frac{64-1}{6}$$

$$= \frac{63}{6} = \frac{21}{2} = 10\frac{1}{2}$$

6. (A) Number of books bought = $8m + 5n$

Cost of 1 m book = ₹ 25.75

Cost of 1 n book = ₹ 35.75

Total cost

$$= 8(25.75) + 5(35.75)$$

$$= 206 + 178.75$$

$$= ₹ 384.75$$

7. (C) Consider $4x + 6z - (x + 3y - 3x) + 5y$

$$= 4x + 6z - x - 3y + 3x + 5y$$

$$= 6x + 6z + 2y$$

$$= 6 \times 2 + 6 \times (-2) + 2 \times 3$$

$$[\text{put } x = 2, y = 3 \text{ and } z = -2]$$

$$= 12 - 12 + 6$$

$$= 6$$

8. (A) Average of scores = $\frac{a+b+c}{3} \times 100$

$$= \left(\frac{a}{3} + \frac{b}{3} + \frac{c}{3}\right) \times 100$$

9. (A) Since three of the Sundays fall on even numbered days and two on odd numbered days this implies that the first Sunday of the month must fall on an even numbered day. Note that it is not possible for a Sunday to fall on the 4th day of the month because the 5th Sunday would then have to fall on the 32nd day of the month. The five Sundays will fall on the following days of the calendar: 2, 9, 16, 23, 30.

April 8 must be a Saturday.

10. (B) L.C.M. must be divisible by HCF.

11. (C) Suppose that the quotient of the division of 109 by x is q . Since the remainder is 4, this is equivalent to $109 = qx + 4$ or $qx = 105$.

Put another way, x must be a positive integer divisor of 105. Since $105 = 5 \times 21 = 5 \times 3 \times 7$, its positive integer divisors are 1, 3, 5, 7, 15, 21, 35, 105

Of these, 15, 21 and 35 are two-digit positive integers so are the possible values of x .

The sum of these values is $15 + 21 + 35 = 71$.

12. (C) Given,

$$X : Y = 4 : 1 \Rightarrow X = 4Y$$

and $\frac{X-39}{Y+39} = \frac{7}{5}$

$$\Rightarrow 5X - 195 = 7Y + 273$$

$$\Rightarrow 20Y - 195 = 7Y + 273 \quad [\square X = 4Y]$$

$$\Rightarrow 13Y = 468$$

$$\Rightarrow Y = 36$$

$$\therefore X = 4 \times 36 = 144$$

So, $X + Y = 144 + 36$

$$= 180$$

13. (C) When a number n is divided by x , the remainder is the difference between n and the largest multiple of x less than n . When 100 is divided by a positive integer x , the remainder is 10...

This means that $100 - 10 = 90$ is exactly divisible by x . It also means that x is larger than 10, otherwise the remainder would be smaller than 10.

Since 90 is exactly divisible by x , then $11 \times 90 = 990$ is also exactly divisible by x .

Since $x > 10$, then the next multiple of x is $990 + x$, which is larger than 1000.

Thus 990 is the largest multiple of x less than 1000, and so the remainder when 1000 is divided by x is $1000 - 990 = 10$.

14. (B) Each  represents 4 units of water filter.

No. of symbols present on the graph

$$= 6 + 4 + 7 + 6 = 23$$

No. of water filters sold altogether

$$= 23 \times 4 = 92$$

15. (A) Consider

$$52 - [2 - 3 \{4 + (7 - 8) \overline{-2+7}\} - 4]$$

$$= 52 - [2 - 3 \{4 - 1 - 9\} - 4]$$

$$= 52 - [2 - 3 \{-6\} - 4]$$

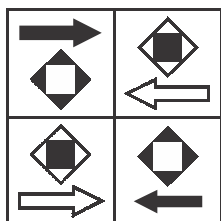
$$= 52 - [2 + 18 - 4]$$

$$= 52 - 16$$

$$= 36$$

Reasoning

16. (A) Here, the whole figure is rotating 90° in clockwise direction after adding a line in the middle of the figure.
On following this pattern option (A) will complete the second pair.
17. (B) Here, in every group, each shape is rotating 90° in clockwise direction. On following this pattern, option (B) will complete the series.
Hence, option (B) is correct.
18. (C) If we see columns, the shaded symbols become unshaded and vice-versa and inverted horizontally.



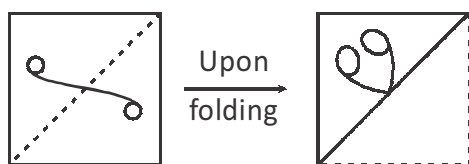
From the above figure we see that, option (C) will complete the grid.

Hence, option (C) is correct.

19. (B) In all the options except option (B), the inner most and the middle shapes are same but in option (B) these two shapes are different. So, option (B) is odd one.
Hence, option (B) is correct.

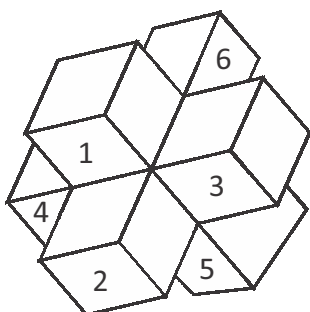


20. (C)
21. (C) The folded transparent sheet will appear as



Hence, option (C) is correct.

22. (B)



It is clear from the above figure, that there are 6 visible cubes and 1 is invisible cube below cube number 1.

∴ Total number of cubes

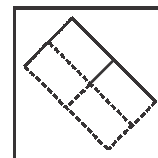
$$= 6 + 1 = 7$$

Hence, option (B) is correct.

23. (C) From the figures (ii) and (iii), it is clear that faces having 1, 3, 4 and 6 dots cannot be appeared opposite to the face having 5 dots. So, the remaining face having 2 dots lies opposite to the face having 5 dots.

Hence, option (C) is correct.

24. (B) The given figure (X) can be traced out in option (B) as shown below



Hence, option (B) is correct.

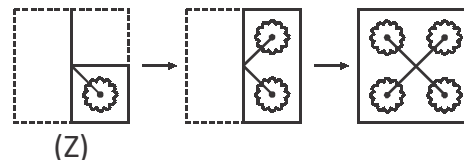
25. (B) Here, the designs in column (i) and column (ii) are combined to get the design in column (iii).

On following this pattern, option (B) will complete the grid.

Hence, option (B) is correct.

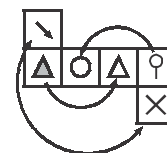
26. (D) In the given series, after every consecutive step, the shape on the bottom left side will move inside the circle and the shape on the top left will move to the bottom side. Hence, the next figure in the series is option (D).

27. (A) Upon unfolding the folded paper represented by fig. (Z), will look like as



Hence, option (A) is correct.

28. (B) It is clear from the given options, that only the net given in option (B) will form the dice as given in question figure. The opposite faces are as shown



So,

△ is opposite to ×

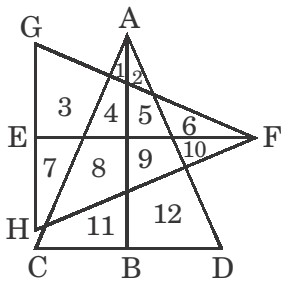
○ is opposite to △

□ is opposite to □

In the given cube no above opposite faces are shown adjacent to each other.

Hence, option (B) is correct.

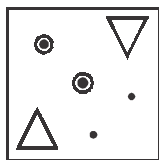
29. (C) The figure may be labelled



Triangles = 1, 2, 6, 10, 1 + 2, 6 + 10, 5 + 6,
 1 + 4, 2 + 5, 9 + 10, 1 + 4 + 8, 2 + 5 + 9,
 4 + 5 + 6, 8 + 9 + 10, 1 + 4 + 8 + 11,
 2 + 5 + 9 + 12, 1 + 2 + 4 + 5, 6 + 5 + 9 + 10,
 3 + 4 + 5 + 6, 7 + 8 + 9 + 10, 1 + 2 + 4 + 5 +
 8 + 9, 4 + 5 + 6 + 8 + 9 + 10

∴ Number of triangles = 22

30. (D) After observation, we see that, option (D) has the same components as that of the figure (X).



Hence option (D) is correct.

Computers

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

English

- 46. (B)
- 47. (C)
- 48. (C)
- 49. (A)
- 50. (A)