



Unified International Cyber Olympiad

UNIFIED INTERNATIONAL CYBER OLYMPIAD

CLASS - 08

Question Paper Code : 3P124

KEY

1. C	2. B	3. A	4. B	5. C	6. C	7. B	8. A	9. C	10. C
11. D	12. C	13. C	14. C	15. C	16. B	17. A	18. C	19. C	20. C
21. B	22. D	23. A	24. D	25. D	26. A	27. B	28. B	29. A	30. D
31. B	32. C	33. B	34. A	35. B	36. A	37. B	38. B	39. D	40. D
41. C	42. C	43. A	44. C	45. B	46. B	47. B	48. D	49. B	50. A

SOLUTIONS

MENTAL ABILITY

01. (C) $\frac{1}{2 \times 2} \times \frac{2}{2 \times 3} \times \frac{3}{2 \times 4} \times \frac{4}{2 \times 5} \times \frac{5}{2 \times 6} \times$
 $\dots \times \frac{30}{2 \times 31} \times \frac{31}{64} = 2^x$
 $\Rightarrow \frac{1}{2^{30} \times 2^6} = 2^x$
 $\Rightarrow 2^{-36} = 2^x$
 $\therefore x = -36$

02. (B) Given $\frac{a^{n+1} + b^{n+1}}{a^n + b^n} = \frac{a+b}{2}$
 $2(a^{n+1} + b^{n+1}) = (a+b)(a^n + b^n)$
 $2a^{n+1} + 2b^{n+1} = a \times a^n + ab^n + ba^n + b \times b^n$
 $\cancel{a^{n+1}} + a^{n+1} + b^{n+1} + \cancel{b^{n+1}} = \cancel{a^{n+1}} + ab^n + a^n b + \cancel{b^{n+1}}$
 $\therefore a^{n+1} - a^n b = ab^n - b^{n+1}$
 $a^n(a - b) = b^n(a - b)$
 $a^n = b^n$
 $\therefore n = 0 \quad [\because a \text{ \& } b \text{ are coprimes}]$
 (OR) Verify from options

03. (A) Side of an equilateral triangle

$$= \frac{\text{Perimeter}}{3}$$

$$= \left(3a - \frac{b}{9} + \frac{c}{81} \right) \text{ cm}$$

$$= \left(\frac{3a}{3} - \frac{b}{9} \times \frac{1}{3} + \frac{6}{81} \times \frac{1}{3} \right) \text{ cm}$$

$$= \left(a - \frac{b}{27} + \frac{c}{243} \right) \text{ cm}$$

04. (B) Sum of three consecutive numbers

$$= 1 + 2 + 3$$

$$= 2 - 1 + 2 + 2 + 1$$

$$= 2 \times 3 = 6$$

$$= \text{Middle number} \times 3$$

$\therefore$ Sum of 29 consecutive numbers

$$= 29 \times \text{middle number}$$

$$= 29 \times 29 = 841$$

05. (C) $998^2 - 2 \times 998 \times 1002 + 1002^2$

$$= (998 - 1002)^2$$

$$= (-4)^2 = 16$$

06. (C) Given $AB \parallel DC$

$$\Rightarrow \angle DAB + \angle ADC = 180^\circ \rightarrow (1)$$

But $AD \parallel BC$

$$\Rightarrow \angle DAB + \angle ABC = 180^\circ \rightarrow (2)$$

from (1) & (2) $\angle DAB + \angle ADC$

$$= \angle DAB + \angle ABC$$

$$\angle ADC = \angle ABC$$

$$\therefore \frac{4x}{3} - \frac{x}{2} + \frac{67^\circ}{2} = \frac{x}{2} + \frac{5x}{3} - \frac{53^\circ}{2}$$

$$\frac{67^\circ}{2} + \frac{53^\circ}{2} = \frac{x}{2} + \frac{5x}{3} - \frac{4x}{3} + \frac{x}{2}$$

$$= \frac{3x + 10x - 8x + 3x}{6} \Rightarrow \frac{120^\circ}{2} = \frac{8x}{6}$$

$$x = 60^\circ \times \frac{3}{4} = 45^\circ$$

$$\therefore \angle ABC = \frac{x}{2} + \frac{5x}{3} - \frac{53^\circ}{2} = \frac{45^\circ}{2} + \frac{5 \times 45^\circ}{3} - \frac{53^\circ}{2}$$

$$= 75^\circ + \frac{45^\circ - 53^\circ}{2}$$

$$= 75^\circ - \frac{8^\circ}{2} = 75^\circ - 4^\circ = 71^\circ$$

07. (B) From options 1208C5 is divisible by 11

(OR)

Given 1208C5 is divisible by 11

$(5 + 8 + 2) - (C + 0 + 1)$ is divisible by 11

$$15 - C - 1 = 11 \Rightarrow 14 - C = 11$$

$$11 - 14 = C \Rightarrow C = 3$$

08. (A) $\angle A + \angle C + \angle A + \angle B = 120^\circ + 100^\circ$

$$\therefore \angle A + 180^\circ = 220^\circ$$

$$\angle A = 220^\circ - 180^\circ = 40^\circ$$

09. (C) $\sqrt{1^3 + 2^3 + 3^3 + 4^3 + 5^3 + 6^3 + 7^3}$

$$= \sqrt{1 + 8 + 27 + 64 + 125 + 216 + 343}$$

$$= \sqrt{784} = 28$$

10. (C) $\frac{3}{4} + \frac{5}{36} + \frac{7}{144} + \frac{9}{400} + \frac{11}{900}$

$$= \frac{3}{2^2} + \frac{5}{6^2} + \frac{7}{12^2} + \frac{9}{20^2} + \frac{11}{30^2}$$

$$= \frac{3}{(1 \times 2)^2} + \frac{5}{(2 \times 3)^2} + \frac{7}{(3 \times 4)^2} + \frac{9}{(4 \times 5)^2} + \frac{11}{(5 \times 6)^2}$$

$$= \left(1 - \frac{1}{2^2} \right) + \left(\frac{1}{2^2} - \frac{1}{3^2} \right) + \left(\frac{1}{3^2} - \frac{1}{4^2} \right)$$

$$+ \left(\frac{1}{4^2} - \frac{1}{5^2} \right) + \left(\frac{1}{5^2} - \frac{1}{6^2} \right)$$

$$= 1 - \frac{1}{4} + \frac{1}{4} - \frac{1}{9} + \frac{1}{9} - \frac{1}{16} + \frac{1}{16} - \frac{1}{25}$$

$$+ \frac{1}{25} - \frac{1}{36} = 1 - \frac{1}{36} = \frac{36-1}{36} = \frac{35}{36}$$

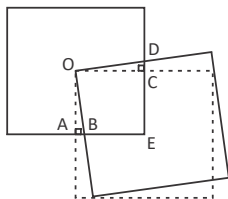
11. (D) Difference of marbles between Kiran and Karan =

$$\frac{7}{2+5+7} \times 280 - \frac{2}{2+5+7} \times 280$$

$$= 140 - 40 = 100$$

12. (C) $11 + 99 + 88 = 198 \Rightarrow 1 + 9 + 8 = 18$

13. (C)



In $\triangle AOB$ $\angle AOB = x$ then

$$\angle BOC = 90^\circ - x$$

$$\therefore \angle COD = \angle BOD - \angle BOC$$

$$= 90^\circ - (90^\circ - x)$$

$$= 90^\circ - 90^\circ + x = x$$

$$\angle COD = \angle AOB \rightarrow (1)$$

In $\triangle AOB$ & $\triangle COD$

$$\angle A = \angle C = 90^\circ \quad (\text{angle})$$

$$OA = OC \quad (\text{side})$$

$$\angle AOB = \angle COD$$

($\therefore$ angle & from eq (1))

$$\therefore \triangle AOB \cong \triangle COD$$

[$\therefore$ ASA congruency]

$$\therefore \text{Area of } \triangle AOB = \text{area of } \triangle COD$$

Area of shaded region BEDO = area of quadrilateral BECO + area of $\triangle COD$

= Area of quadrilateral BECO + area of $\triangle AOB$

$$= \text{Area of square OAEC} = \frac{1}{4} \text{ area of original square} = 6 \text{ cm}^2$$

14. (C) 6307 is not divisible by 43

6307 is not divisible by 47

6307 is divisible by 53

7473 is divisible by 53

8692 is divisible by 53

$\therefore$ All numbers are divisible by 53

15. (C) Excluded number = $29 \times 5 - 27 \times 4$

$$= 145 - 108 = 37$$

REASONING

16. (B) The upper letter represents the fill pattern, and the lower letter represents the shape. The final figure is a vertically striped circle, so its code is SJ.

17. (A) $2(23) + 3(14) - 59$

$$= 46 + 42 - 59$$

$$= 88 - 59 = 29$$

18. (C) The arrows follow a fixed pattern. From one box to the next, each arrow moves to the next position

19. (C) $156 \rightarrow 1 + 5 + 6 = 12$.

So, apply same rule : $217 \rightarrow 2 + 1 + 7 = 10$

20. (C) The relationship is $x = \frac{x^2}{2}$, i.e., $6: \frac{6^2}{2}$.

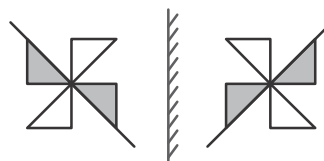
$$\text{Similarly } 4: \frac{4^2}{2} = 8$$

$$\text{We have: } 4 \times 3 \times 2/8 = \frac{24}{8} = 3$$

$$7 \times 2 \times 4/8 = \frac{56}{8} = 7$$

$$\text{Thus, missing number} = 2 \times 4 \times 4/8 = \frac{32}{8} = 4$$

21. (B) Rohan finishes 30 m east and 26 m south of his starting point. Since he is east as well as south of point P, he is in the South-East direction.

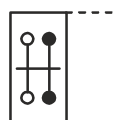


22. (D)

23. (A) The 3rd, 6th, 9th, and 10th letters are R, T, S, and I. These letters form the meaningful word STIR, whose last letter is R.



24. (D)



25. (D)

26. (A) The figures are classified according to their internal design, regardless of the outer shape. Figures 1, 2, and 5 have the same web-like curved pattern; figures 3, 7, and 8 have the same globe-like curved grid pattern; and figures 4, 6, and 9 have straight lines radiating from a common point. Hence, the correct grouping is 1,2,5; 3,7,8; 4,6,9 (Option A).
27. (B) Rearranging the letters of YGEAVO forms the meaningful word VOYAGE, which means a long journey, especially by sea or through space.
28. (B) The figure contains 4 small squares, 1 large outer square, 4 tilted squares formed inside the quadrants, and 1 larger tilted square at the centre. Therefore, the total number of squares is 10.
29. (A) The letters advance by +2, +3, +4, +5 (A, C, F, J, O), while the numbers increase by +4, +6, +8, +10 (2, 6, 12, 20, 30). Therefore, the next term is O30.
30. (D) From the figure 6 is opposite 2, 1 is opposite 4. So, 3 will be opposite 5 and will appear on top face.

COMPUTERS

31. (B) A polymorphic virus changes its code each time it infects a new file, making it difficult for antivirus software to detect while continuing to infect files.
32. (C) The Power Supply Unit (PSU) converts AC power from the wall outlet into the DC voltages required by a computer's internal components.
33. (B) Using the Raise Hand feature and waiting for permission to speak demonstrates netiquette, which refers to polite and respectful behaviour during online communication.
34. (A) A worm is a self-replicating malware that spreads automatically, often through email or networks, causing unusually high network activity.
35. (B) Since 1 GB = 1024 MB, 1 MB = 1024 KB, and 1 KB = 1024 bytes, 2 GB = $2 \times 1024 \times 1024$ bytes.
36. (A) Moving the last keyframe farther along the timeline increases the animation duration while keeping the same motion path. As a result, the object moves more slowly.
37. (B) Conditional Formatting automatically highlights cells that satisfy a specified condition.
38. (B) Adding more relevant and specific keywords makes the search query more precise, resulting in more relevant search results.
39. (D) The alt attribute provides a text description of an image when it cannot be displayed or accessed by screen readers.
40. (D) A Query retrieves and displays records that meet specified criteria without modifying the data stored in the tables.
41. (C) The icon represents the New Slide command, which adds a new slide to the current presentation. It is located in the Slides group on the Home tab. Therefore, both statements are correct.
42. (C) In MS Word 2010, Restrict Editing allows the author to protect the document with a password and prevent unauthorized users from disabling Track Changes.
43. (A) The href attribute specifies the destination of a hyperlink.

For example,

`<a href="https://www.school.edu">Visit School Website</a>`

Without the href attribute, the text is displayed but does not open any webpage when clicked.
44. (C) The correct answer is: It translates between different network protocols.

The communication device acts as a gateway, translating data between different network protocols so that the two networks can communicate successfully.
45. (B) A container tag consists of an opening tag and a corresponding closing tag, with content placed between them.

ENGLISH

- 46. (B)
- 47. (B)
- 48. (D)

- 49. (B)
- 50. (A)

==== *The End* =====