UNIFIED COUNCIL

An ISO 9001:2015 Certified Organisation

UCO Unified Cyber Olympiad

UNIFIED CYBER OLYMPIAD (UPDATED)

CLASS - 10

Question Paper Code : UC359

KEY

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

SOLUTIONS

MENTAL ABILITY

1. **(C)** Given s =

$$s = \frac{a+b+c}{2} = \frac{(29+120+101)}{2}\text{cm} = 125\text{cm}$$

$$\Delta = \sqrt{s(s-a)(s-b)(s-c)} = \sqrt{125\times96\times5\times24}\ \text{cm}^2$$

$$= 1200\ \text{cm}^2$$

2. **(B)** probebility of Not getting 3 (or) 6 $= \frac{4}{6} = \frac{2}{3}$

3. **(B)** 11(5 × 7 + 1) = 11 × 36 which is a composite number

4. **(C)** $\alpha+\beta = \frac{-4}{3}$ & $\alpha\beta = 1$

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

$$= \frac{(\alpha+\beta)^2 - 2\alpha\beta - 2(1)^2}{(1)}$$

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

$$= \frac{16}{9} - 4$$

$$= \frac{-20}{9}$$

5. **(B)** Given $\frac{n(n+1)}{2} = 528$

$n^2 + n = 1056$

$n^2 + n - 1056 = 0$

$n^2 + 33n - 32n - 1056 = 0$

$n = -33$ (or) $n = 32$

6. **(A)** Given $x^2 + (25 - x)^2 = 317$

$x^2 + 625 - 50x + x^2 = 317$

$2x^2 - 50x = 317 - 625$

$2(x^2 - 25x) = -308$

$x^2 - 25x = -154$

$x^2 - 25x + 154 = 0$

$x^2 - 14x - 11x + 154 = 0$

$x = 14$ (or) $x = 11$

7. **(D)** Let $x + \frac{1}{x} = a \Rightarrow x^2 + \frac{1}{x^2} = a^2 - 2$

$$\therefore 9\left(x^2 + \frac{1}{x^2}\right) - 9\left(x + \frac{1}{x}\right) = 52$$

$\Rightarrow$ $9(a^2 - 2) - 9a = 52$

$9a^2 - 18 - 9a = 52$

$9a^2 - 9a = 52 + 18$

$9a^2 - 9a = 70$

$9a^2 - 9a - 70 = 0$

$9a^2 - 30a + 21a - 70 = 0$

$3a(3a - 10) + 7(3a - 10) = 0$

$(3a - 10)(3a + 7) = 0$

$$\left[3\left(x + \frac{1}{x}\right) - 10\right]\left[3\left(x + \frac{1}{x}\right) + 7\right] = 0$$

$$\left(3x + \frac{3}{x} - 10\right)\left(3x + \frac{3}{x} + 7\right) = 0$$

$$\therefore \frac{3x^2 + 3 - 10x}{x} = 0 \text{ (or) } \frac{3x^2 + 7x + 3}{x} = 0$$

$$\therefore \frac{3x^2 + 3 - 10x}{x} = 0 \text{ (or) } \frac{3x^2 + 7x + 3}{x} = 0$$

$3x^2 - 10x + 3 = 0$ $\quad$ $3x^2 + 7x + 3 = 0$

$3x^2 - 9x - x + 3 = 0$ $\quad$ $x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$

$x = 3$ (or) $\frac{1}{3}$ $\quad$ $= \frac{-7 \pm \sqrt{49 - 36}}{6}$

8. **(A)** Given $a_{10} = a + 9d = 21 \rightarrow (1)$

$s_{19} = \frac{19}{2}[2a + 18d]$

$= \frac{19}{2} \times 2(a + 9d)$

$= 19(a + 9d)$

$= 19 \times 21$

$= 399$

9. **(B)** $a^3 + b^3 + c^3 - 3abc$

$= (a + b + c)(a^2 + b^2 + c^2 - ab - bc - ca)$

$= (a + b + c)\,[(a + b + c)^2 - 2(ab + bc + ca) - (ab + bc + ca)]$

$= (11)[11^2 - 2(25) - 25]$

$= 11[121 - 75]$

$= 11 \times 46$

$= 506$

10. **(A)** Non prime numbers up to 50 are 1, 4, 6, 8, 9, 10, 12, 14, 15, 16, 18, 20, 21, 22, 24, 25, 26, 27, 28, 30, 32, 33, 34, 35, 36, 38, 39, 40, 42, 44, 45, 46, 48, 49, 50

$\therefore$ P(NP) = $\frac{35}{50} = \frac{7}{10}$

11. **(C)** $l = \sqrt{h^2 + (R - r)^2} = \sqrt{45^2 + (28 - 7)^2}$ cm

$= \sqrt{2025 + 441} = \sqrt{2466}$ cm

$l = 49.66$cm

Total surface area = $\pi R^2 + \pi r^2 + \pi(R + r)l$

$= \pi[28^2 + 7^2 + 49.66(35)]\text{cm}^2$

$= \frac{22}{7} \times 7(112 + 7 + 49.66 \times 5)\text{cm}^2$

$= 22(367.3)$ cm^2

$= 8080.6$ cm^2

12. **(C)** Given $\frac{1}{x}+\frac{1}{2y}=8$ and $\frac{1}{2x}-\frac{1}{y}=-1$

Let $\frac{1}{x}=a$ & $\frac{1}{y}=b$

$a+\frac{b}{2}=8 \Rightarrow 2a+b=16 \rightarrow (1)$

$\frac{a}{2}-b=-1 \Rightarrow a-26=-2 \rightarrow (2)$

solving eq (1) & (2) a = 6 & b = 4

$\therefore x=\frac{1}{a}=\frac{1}{6}$ & $y=\frac{1}{b}=\frac{1}{4}$

13. **(C)** Given $x+1, 2x-\frac{1}{2}, 2x+2$ are in AP

$\therefore a_2 - a_1 = a_3 - a_2$

$\therefore \left(2x-\frac{1}{2}\right)-(x+1)=(2x+2)-\left(2x-\frac{1}{2}\right)$

$\left(2x-\frac{1}{2}\right)+\left(2x-\frac{1}{2}\right)=(2x+2)+(x+1)$

$4x - 1 = 3x + 3$

$4x - 3x = 4$

$x = 4$

14. **(D)** Given $\pi r^2 h = 1782\ cm^3$

$\frac{22}{7} \times r^2 \times 7\ cm = 1872\ cm^3$

$r^2 = \frac{1782}{22}\ cm^2$

$r^2 = 81\ cm^2$

$r = 9\ cm$

curved surface area = $2\pi rh$

$= 2 \times \frac{22}{7} \times 9 \times 7\ cm^2 = 396\ cm^2$

15. **(D)** Given $\alpha=7+4\sqrt{3}$ & $\beta=7-4\sqrt{3}$

$\alpha+\beta=7+4\sqrt{3}+7-4\sqrt{3}=14$

$\alpha\beta=(7+4\sqrt{3})(7-4\sqrt{3})=49-48=1$

$\therefore$ Required quadratic polynomial

$= x^2 - (\alpha+\beta)x + \alpha\beta = 0$

$\Rightarrow x^2 - 14x + 1 = 0$

REASONING

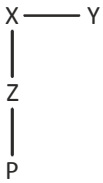
16. **(D)** MARVELOUS

17. **(D)**

18. **(C)** manmanmanman

19. **(B)** There are 24 triangles in the given figure.

20. **(D)**



'P' south-west direction to Y.

21. **(D)** Sister

22. **(D)** E Represents number of stars

F Represents the number of stars below the horizontal line.

23. **(A)** Kishan > Rishab > Ishan > Kushal > Vishnu > Aman > Arya.

Kishan is the heaviest.

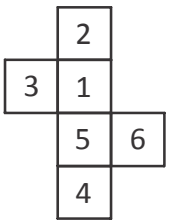
24. **(D)** $729 \Rightarrow 9^3$

$343 \Rightarrow 7^3$

$1331 \Rightarrow 11^3$

2743 is not any cube

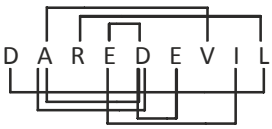
25. **(D)**



26. **(B)** In given word, word is divided into three parts like COM+PLE+TED, then these parts are written in reverse order as MOC+ELP+DET. So DIRECTION will be DIR+ECT+ION, which will be RIDTCENOI.

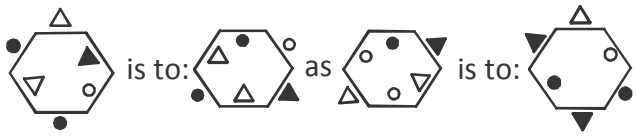
27. **(A,D)** B, C, D options are decreasing order.

28. **(B)** The word 'Year' cannot be formed by the word Mysterious.

29. **(A)** 

9 ways.

30. **(D)**



COMPUTERS

31. **(B)** Select Insert → Sound
32. **(C)** Custom Animation
33. **(B)** The maximum size of a word document is 32 MB.
34. **(D)** We enter 3 types of data in cells : labels, numbers and formulae.
35. **(B)** Intellectual Property Rights refers to rights involving copyright.
36. **(B)** Privacy
37. **(A)** VGA stands for Video Graphics Array.
38. **(D)** GIF
39. **(C)** IDE stands for Integrated development environment.
40. **(B)** In MS-Access to open an existing database we should press ctrl + O
41. **(D)** Sorting
42. **(A)** Str$(300)
43. **(A)** HTML is case sensitive, not correct statement.
44. **(B)** href = “ ”
45. **(D)** The advantage of using a spread sheet are calculations can be done automatically, changing data automatically updates calculations and more flexibility.

ENGLISH

46. **(D)** is the correct option. It is the only word where ‘ch’ is pronounced differently than in the other three.
47. **(B)** Confluence
48. **(A)** Quiver. A scabbard is what in a sword is kept when not in use and while being carried. So is a quiver for arrows.
49. **(C)** Tim said that he didn’t care, if mom came to know.
50. **(A)** Cut, slack.

The End