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UNIFIED COUNCIL OLYMPIADS

UIC
Unified International Cyber Olympiad

UNIFIED INTERNATIONAL CYBER OLYMPIAD

CLASS - 9

Question Paper Code : 3B117

KEY

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

SOLUTIONS

MENTAL ABILITY

01. (D) Given $x = \frac{1}{2-\sqrt{3}} = \frac{1}{2-\sqrt{3}} \times \frac{2+\sqrt{3}}{2+\sqrt{3}}$

$= \frac{2+\sqrt{3}}{4-3} = 2+\sqrt{3}$

$\therefore \quad x = 2+\sqrt{3}$

$\Rightarrow x - 2 = \sqrt{3}$

Squaring on both sides

$x^2 - 4x + 4 = 3$

$\therefore x^2 - 4x + 1 = 0$

$x^2 - 4x + 1$ | $x^3 - 2x^2 - 7x + 6$ | $x + 2$

$x^3 - 4x^2 + x$

(–) (+) (–)

$2x^2 - 8x + 6$

$2x^2 - 8x + 2$

(–) (+) (–)

4

$\therefore \quad x^2 - 2x^2 - 7x + 6 = (x^2 - 4x + 1)(x + 2) + 4$

$= 0\,(x + 2) + 4$

$= 4$

02. (C) Given $\frac{x+y}{xy}=\frac{7}{12}$

$(x+y)=\frac{7xy}{12}$

$=\frac{7\times \cancel{12}}{\cancel{12}}$

$x + y = 7$ & $xy = 12$

$\therefore$ $x = 4$ & $y = 3$

$\therefore$ $3x + 2y = 4 \times 3 + 2 \times 3 = 12 + 6 = 18$

03. (B) $(x + 4)(x + 7)(x + 5)(x + 6) - 1680 = 0$

$(x^2 + 11x + 28)(x^2 + 11x + 30) - 1680 = 0$

$a(a + 2) - 1680 = 0$

Where, $a = (x^2 + 11x + 28)$

$a^2 + 2a - 1680 = 0$

$a^2 + 42) - 40a - 1680 = 0$

$a(a + 4x - 40(a + 42) = 0$

$(a + 42)(a - 40) = 0$

$\therefore$ $a = 40$

$x^2 + 11x + 28 = 40$

$x^2 + 11x - 12 = 0$

$x^2 + 12x - 1x - 12 = 0$

$x(x + 12) - 1(x + 12) = 0$

$(x + 12)(x - 1) = 0$

$x + 12 = 0$ or $x = 1$

04. (C) LCM of 21,36 and 66 = $6^2 \times 7 \times 11$

$\therefore$ $6^2 \times 7 \times 11$ is a perfect square then

$6^2 \times 7^2 \times 112 = 2,13,444$

05. (C) $\alpha\beta=\frac{c}{a}=\frac{6\sqrt{3}}{\sqrt{3}}=6$

06. (A) If $f(x) = (x^3 - 6x^2 + 2x - 4)$ is divided by $(1 - 3x)$ then remainder is $f\left(\frac{1}{3}\right)$

$\therefore f\left(\frac{1}{3}\right)=\left(\frac{1}{3}\right)^3-6\left(\frac{1}{3}\right)^2+2\left(\frac{1}{3}\right)-4$

$=\frac{1}{27}-\frac{\cancel{6}^2}{\cancel{9}_3}+\frac{2}{3}-4$

$=\frac{1}{27}-4=\frac{1-108}{27}=\frac{-107}{27}$

07. (C) It is in inverse proportion

$\therefore$ $1600 \times 60 = 1200 \times x$

$\frac{1600\times 60}{1200}=x$

$x = 80$ days

08. (B) Given $h = 2r$

Volume ratio of sphere, cylinder and cone $=\frac{4}{3}\pi r^3:\pi r^2(2r):\frac{1}{3}\pi r^2(2r)$

$=\frac{4}{3}\pi r^3:2\pi r^3\frac{2}{3}\pi r^3$

$=\frac{2}{3}:1:\frac{1}{3}$

$= 2 : 3 : 1$

09. (D) Given diameter of sphere = 21 cm

$\therefore$ Radius of sphere $=\frac{21}{2}$cm

$\therefore$ Volume of sphere $=\frac{4}{3}\pi r^3$

$=\frac{\cancel{4}^{\cancel{2}^1}}{\cancel{3}}\times\frac{\cancel{22}^{11}}{\cancel{7}_1}\times\frac{\cancel{21}^{\cancel{3}}}{\cancel{2}}\times\frac{21}{\cancel{2}}\times\frac{21}{\cancel{2}_1}cm^3$

$= 4851 cm^3$

10. (C) $x = 5$

1	−7	9	7	−10
0	5	−10	−5	10
5	−2	−1	2	0

$(x - 5)$ is a factor of $p(x)$

11. (A) Given $C = a^{2x} = (b^{2z})^{2x} = b^{4xz} = (c^{2y})^{4xz} = c^{3xyz}$

$\therefore$ $C = C^{8xyz} \Rightarrow xyz = \frac{1}{8}$

12. (D) Let cost of each bat be ₹ x

Given 7 bats + 6 balls = ₹ 3800

$\Rightarrow 7x + 6y = 3800 \rightarrow (1)$

Given $3x + 5y = ₹\ 1750$

eq (1) × 5 $\Rightarrow$ $35x + 30y = 19000$

eq (2) × 6 $\Rightarrow$ $18x + 30y = 10500$

$$17x = 8{,}500$$

$$x = \frac{8500}{12}$$

$$x = 500$$

13. (B) From option 962 safisfies the given all conditions

14. (A) Given h = a

Given $a^3 = \pi r^2 h$

$h^3 = \pi r^2 h$

$\pi r^2 = h^2$

$$r^2 = \frac{h^2}{\pi}$$

$$r = \sqrt{\frac{h^2}{\pi}} = \frac{h}{\sqrt{\pi}}$$

15. (A) $$k\sqrt{6} = \left[(4+\sqrt{15})^{3/2} - (4-\sqrt{15})^{3/2}\right]$$

$$= \frac{2^{3/2}}{2^{3/2}}\left[(4+\sqrt{15})^{3/2} - (4-\sqrt{15})^{3/2}\right]$$

$$= \frac{1}{\sqrt{8}}\left[(8+2\sqrt{15})^{3/2} - (8-2\sqrt{15})^{3/2}\right]$$

$$= \frac{1}{\sqrt{8}}\left[(\sqrt{5}+\sqrt{3}+2\sqrt{5}\times\sqrt{3})^{3/2}\right.$$

$$\left. -(\sqrt{5}+\sqrt{3}-2\sqrt{5}\times\sqrt{3})^{3/2}\right]$$

$$= \frac{1}{\sqrt{8}}\left[(\sqrt{5}+\sqrt{3})^{2\times\frac{3}{2}} - (\sqrt{5}-\sqrt{3})^{2\times\frac{3}{2}}\right]$$

$$= \frac{1}{\sqrt{8}}\left[(\sqrt{5}+\sqrt{3})^3 - (\sqrt{5}-\sqrt{3})^3\right]$$

$$= \frac{1}{2\sqrt{2}}\left[(\sqrt{5})^3 + 3(\sqrt{5})^2(\sqrt{3}) + 3(\sqrt{5})(\sqrt{3})^2 + (\sqrt{3})^3\right.$$

$$\left. -(\sqrt{5})^3 + 3(\sqrt{3})^2(\sqrt{3})\right]$$

$$= \frac{1}{2\sqrt{2}}\left[30\sqrt{3} + 6\sqrt{3}\right]$$

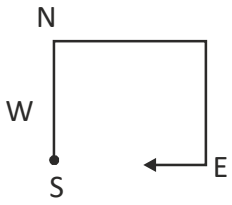
$$= \frac{36\sqrt{3}}{2\sqrt{2}} = \frac{18\sqrt{3}}{\sqrt{2}} \times \frac{\sqrt{2}}{\sqrt{2}} = \frac{18}{2}\sqrt{6}$$

$k\sqrt{6} = 9\sqrt{6}$ $\quad\therefore\quad k = 9$

REASONING

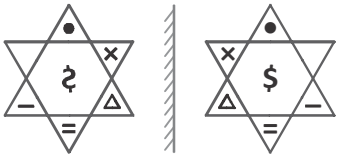
16. (B) lip (slippers)

17. (D)



Finally Ravi faces west direction.

18. (A)



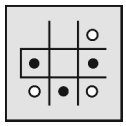
19. (C) $$\frac{81}{9} - \frac{56}{7} = 9 - 8 = 1$$

$$\frac{252}{12} - \frac{72}{6} = 21 - 12 = 9$$

$$\frac{36}{3} - \frac{27}{9} = 12 - 3 = 9$$

20. (C) Moving u from louse leaves us with lose and adding it to hose makes house. Louse is the plural of lice, which are fleas!

21. (C)



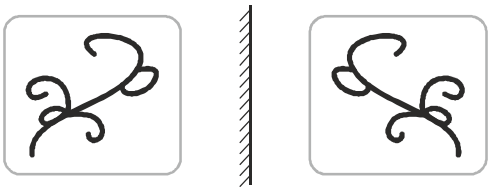
22. (A) A and C only

23. (B) The letters at odd positions are each moved two steps backward and those at even positions are each moved two steps forward to obtain the corresponding letters of the code.

24. (B) Set A: Each box contains five lines and two circles.

Set B: Each box contains four lines and two circles.

Figure : The Figure contains four lines and two circles.

25. (D) 

We are asked to find a hidden four-letter word that appears between two words next to each other.

Looking at the sentence:

"Little apples grow on a tree..."

If we combine "apple" + "grow", we get "pleg"... wait, check carefully.

Let's analyze step by step:

Hidden word must be four letters inside the junction of two adjacent words.

The words are next to each other; we look at overlaps:

1. little apples → overlap letters: "appl" → 4 letters → Yes!

2. apple grow → overlap letters: "egr" → only 3 letters → no

3. tree in → "rein" → 4 letters → also possible

4. our garden → "urga" → 4 letters → possible

Usually, "hidden word" puzzles mean letters from end of first + start of second.

Check:

little apples → last 2 of "little" + first 2 of "apples" = "leap" → a valid word

So the correct hidden word is LEAP, formed between little apples.

26. (D) NILE → river

THAMES → river

LIVERPOOL → river

MANGO → fruit

MANGO is different from others.

27. (D) INSTALMENT

In STAMINA we use letter 'A' two times.

So, STAMINA is cannot be formed with the letters in INSTALMENT.

28. (D) All the letters are flipped vertically (or are water images) except option D where letter F is inverted horizontally (or is a mirror image)

29. (D) There are 9 parallelograms in the given figure.

30. (D) Renu's father is the son of Sunita Mens Renu is grand daughter of Sunita and the girl is the mother of Renu, that means the girls is the daughter in law of Sunita. Sunita is Mother-in-law

COMPUTERS

31. (A) A drop cap is a large capital letter used as a decorative element at the beginning o a paragraph or section. The size of a dropcap is usually two or more lines.

32. (C) Antivirus software is an example of utility software.

33. (D) Except option (D) remaining option are image format. DPI means Dots Per Inch.

34. (D) C2C (Consumer-to-Consumer) e-commerce allows consumers to buy and sell directly to each other, usually through a platform.

Examples: eBay, OLX, Craigslist.

Other types:

B2B (Business-to-Business): Businesses sell to other businesses.

C2B (Consumer-to-Business): Consumers sell products or services to businesses.

BC2 is not a standard e-commerce model.

35. (C) X switch foreground and background colours in photoshop.

36. (D) Weather conditions have no effect on wi-fi signals.

37. (A) LAN (Local Area Network) connects devices in a limited area (like a building) and allows communication without needing the internet.

WAN (Wide Area Network) connects devices over a large area and may use the internet.

TCP/IP is a communication protocol, not a network type.

DSL is a type of internet connection.

38. (B) First generation (1946–1959) → Vacuum tubes (e.g., UNIVAC I, ENIAC)

Second generation (1959–1965) → Transistors (e.g., IBM 1401, IBM 1620, CDC 1604)

Third generation (1965–1971) → Integrated circuits (e.g., IBM System/360)

Fourth generation (1971–1980 onwards) → Microprocessors

IBM 1620, IBM 7094, CDC 1604, UNIVAC 1108 used transistors, so they belong to the second generation.

39. (C) Optical fibres are used to transmit data in the form of light beams.

40. (B) 3, 1, 2.

41. (B) ctrl + D is used to open the font dialogue box in MS-Word.

42. (B) In Visual Basic, the extension for a project file is .vbp (Visual Basic Project).

.frm → Form file

.cls → Class module file

.vbs → VBScript file

43. (D) Event: The reaction invoked by a control when some action occurs, for example, a button is clicked or data is entered in a textbook, etc.

44. (D) Cables and Twisted pair lines are limited to shorter distances or require extensive infrastructure over long distances.

Magnetic rays is not a standard long-range communication technology.

Communication satellites are ideal for connecting computers across countries/ continents without physical wiring limitations.

45. (B) Bit, Byte, Kilobyte, Megabyte.

ENGLISH

46. (C)

47. (C) 'an, an, a' is the correct answer. We decide to use an article based on the vowel/consonant sound the first syllable of a word produces. In 'MBA' and 'M.A.' the sound produced is that of 'aim', which is a vowel sound, hence the article 'an'. In the case of 'university', the sound produced is that of 'you', which is a conconant sound, hence the article 'a'.

48. (B) The

49. (C) 'Rutt' is an incorrect spelling.

50. (B)