



Unified International Cyber Olympiad

UNIFIED INTERNATIONAL CYBER OLYMPIAD

CLASS - 9

Question Paper Code : 3P114

KEY

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

SOLUTIONS

MENTAL ABILITY

01. (A) Simplify each root

$$\sqrt{405} = \sqrt{9 \times 9 \times 5} = 9\sqrt{5}$$

$$\sqrt{125} = \sqrt{25 \times 5} = 5\sqrt{5}$$

$$\sqrt{200} = \sqrt{100 \times 2} = 10\sqrt{2}$$

$$\sqrt{50} = \sqrt{25 \times 2} = 5\sqrt{2}$$

Combine terms

$$(9\sqrt{5} - 5\sqrt{5}) + (10\sqrt{2} - 5\sqrt{2})$$

$$= 4\sqrt{5} + 5\sqrt{2}$$

$$= \sqrt{80} + \sqrt{50}$$

02. (A) $x^4 + 4 = x^4 + 4 + 4x^2 - 4x^2$

$$= (x^2)^2 + 2(2x^2) + 2^2 - 4x^2$$

$$= (x^2 + 2)^2 - (2x)^2$$

$$= (x^2 + 2 - 2x)(x^2 + 2 + 2x)$$

$$x^4 + 4 = (x^2 - 2x + 2)(x^2 + 2x + 2)$$

03. (C) Greatest 7-digit number divisible by 15, 21, and 36 :

Step 1: Find LCM of 15, 21, 36 = 1260.

$$\begin{array}{r}
 1260 \overline{) 9999999} \left(\begin{array}{l} 7936 \\ 8820 \end{array} \right. \\
 \underline{11799} \\
 11340 \\
 \underline{4599} \\
 3780 \\
 \underline{8199} \\
 7560 \\
 \underline{639}
 \end{array}$$

Required number = 99,99,999 – 639
= 99,99,360

04. (C) Cost of 52 cycles = 52 × Rs. 5250
Cost of each new cycle
= Rs. (5250 + 210) = Rs. 5460
Number of cycles can be brought

$$= \frac{52 \times 5250}{5460} = 50$$

05. (D) Factor the quadratic using the middle - term split

$$\begin{aligned}
 & (5\sqrt{5}x^2 + 25x + 3x + 3\sqrt{5}) \\
 &= 5\sqrt{5}x(x + \sqrt{5}) + 3(x + \sqrt{5}) \\
 &= (5\sqrt{5}x + 3)(x + \sqrt{5}) \\
 &= (5\sqrt{5}x + 3) \text{ is the factor of} \\
 & (5\sqrt{5}x^2 + 28x + 3\sqrt{5})
 \end{aligned}$$

06. (A) Given Expression

$$\left[\left\{ \left(\frac{1}{7^2} \right)^{-2} \right\}^{\frac{-1}{3}} \right]^{\frac{1}{4}} = 7^m$$

Step 1 : Simplify the innermost parentheses

$$\frac{1}{7^2} = 7^{-2}$$

Step 2 : Apply the first exponent (-2)

$$(7^{-2})^{-2} = 7^{(-2) \times (-2)} = 7^4$$

Step 3 : Apply the second exponent $\left(\frac{-1}{3} \right)$

$$(7^4)^{\frac{-1}{3}} = 7^{4 \times \left(\frac{-1}{3} \right)} = 7^{\frac{-4}{3}}$$

Step 4 : apply the final exponent $\left(\frac{1}{4} \right)$

$$\left(7^{\frac{-4}{3}} \right)^{\frac{1}{4}} = 7^{\frac{-4}{3} \times \frac{1}{4}} = 7^{\frac{-1}{3}}$$

Step 5 : Equate to 7^m and solve for m

$$7^{\frac{-1}{3}} = 7^m \Rightarrow m = \frac{-1}{3}$$

07. (D) Use the Remainder Theorem: Substitute $x = -1$ into the polynomial.

$$\text{Calculation : } (-1)^{51} + 51 = -1 + 51 = 50$$

08. (B) Recognize the numerator as a perfect square

$$a^2 + 2ab + b^2 = (a + b)^2$$

Divide by $(a + b)$

$$\frac{(a+b)^2}{a+b} = a+b$$

Remainder = zero

09. (C) Let $\sqrt{x} = a$ and $\sqrt{y} = b$.

The expression becomes

$$\frac{a^3 + b^3}{a + b} = \frac{(a+b)(a^2 - ab + b^2)}{a + b}$$

$$a^2 - ab + b^2 = x - \sqrt{xy} + y$$

10. (C) Given $2\pi rh = 1980 \text{ cm}^2$ eq 1

$$\pi r^2 h = 10,395 \text{ cm}^3 \text{ eq 2}$$

$$\frac{\text{eq 1}}{\text{eq 2}} \Rightarrow \frac{\pi r^2 h}{2\pi rh} = \frac{10,395 \text{ cm}}{1980 \text{ cm}^2}$$

$$\frac{r}{2} = \frac{21}{4} \text{ cm}$$

$$r = \frac{21}{4} \times 2$$

$$\frac{r}{2} = \frac{21}{4} \text{ cm}$$

$$2 \times \frac{22}{7} \times \frac{21}{2} \times h = 1980 \text{ cm}^2 \text{ eq 1}$$

$$h = \frac{1980}{3 \times 22 \text{ cm}} = 30 \text{ cm}$$

Total Surface Area of Cylinder = $2\pi r(h + r)$

$$= 2 \times \frac{22}{7} \times \frac{21}{2} \left(30 + \frac{21}{2} \right) \text{ cm}^2$$

$$= 66 \times \frac{81}{2} = 2673 \text{ cm}^2$$

11. (B) Circumference of circular path

$$= 2\pi r = 2 \times \frac{22}{7} \times 14 \text{ m}$$

$$= 88 \text{ m}$$

Time taken to cover 88 m to Narayana

$$= \frac{88 \text{ m}}{17.6 \text{ KMPH}} = \frac{88 \text{ m}}{17.6 \times \frac{5 \text{ m}}{18 \text{ sec}}}$$

$$= 18 \text{ seconds}$$

Time taken to cover 88 m to krishna

$$= \frac{88 \text{ m}}{26.4 \text{ KMPH}} = \frac{88 \text{ m}}{26.4 \times \frac{5 \text{ m}}{18 \text{ sec}}}$$

$$= 12 \text{ seconds}$$

LCM of 18 seconds and 12 seconds is 36 seconds.

12. (A) Let $p(x) = (x - 1)^7 = a_7x^7 + a_6x^6 + a_5x^5 + \dots + a_1x + a_0$

$$\text{If } x = 1 \Rightarrow P(1) = (1 - 1)^7 = a_7(1)^7 + a_6(1)^6 + a_5(1)^5 + \dots + a_1(1) + a_0$$

$$0 = a_7 + a_6 + a_5 + \dots + a_1 + a_0$$

13. (D) Given $4\pi r^2 = 1018\frac{2}{7} \text{ cm}^2$

$$4 \times \frac{22}{7} \times r^2 = \frac{7128}{7} \text{ cm}^2$$

$$\therefore r^2 = \frac{7128}{7} \text{ cm}^2 \times \frac{7}{22 \times 4} \times \frac{1}{4}$$

$$r^2 = (9 \text{ cm})^2$$

$$r = 9 \text{ cm}$$

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

$$= \frac{4}{3} \times \frac{22}{7} \times 9^3 \times 9 \times 9 \text{ cm}^3$$

$$= 3054.85 \text{ cm}^3 = 3054.9 \text{ cm}^3$$

14. (A) If a number is divisible by 12 means it must be divisible by 3 and 12

Option (A) : Sum of the digits = 51 which is divisible by 3.

Last two digits are divisible by 4

$\therefore$ Option (A) is divisible by 12

15. (D) Given $3x + 4y = 0$ (1)

$$5x - 7y = 41 \quad \text{..... (2)}$$

$$\text{Eq. (1)} \times 5 \Rightarrow 15x + 20y = 0$$

$$\text{Eq. (2)} \times 3 \Rightarrow 15x - 21y = 123$$

$$\begin{array}{r} (-) \quad (+) \quad (-) \\ \hline \end{array}$$

$$41y = -123$$

$$y = -123 / 41 = -3$$

$$3x + 4(-3) = 0$$

$$3x - 12 = 0$$

$$3x = 12$$

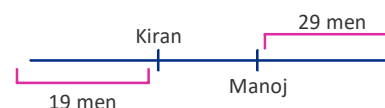
$$x = 4$$

$$x - y = 4 - (-3)$$

$$= 4 + 3 = 7$$

REASONING

16. (C) According to question, we have



After interchanging their positions.



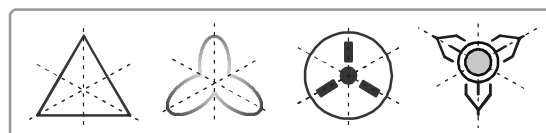
So, number of men in the row = $19 + 1 + 34 = 54$

17. (A) Ruby : Red :: Sapphire : ?

This is a "Gemstone: Color" relationship.

- A Ruby is known for its Red color.
- A Sapphire is commonly known for its Blue color.

18. (A) Group belongs on 3 lines of symmetry

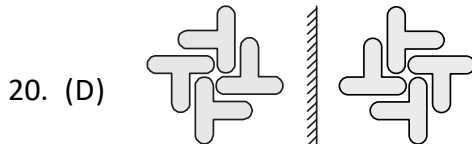


19. (A) $2 + 3 \rightarrow 2$ is the child of 3
 $3 \times 1 \rightarrow 1$ is the wife of 3
 $1 + 4 \rightarrow 1$ is the child of 4
 $4 \times 5 \rightarrow 5$ is the wife of 4

So:

4 and 5 are a married couple $\rightarrow$ Their child is 1 $\rightarrow$ 1 is married to 3 $\rightarrow$ 2 is the child of 3.

That makes 2 the grandchild of 4



21. (D) Take all letters in even places in the alphabet (2nd, 4th, 6th, etc.) and write them down one by one in order.

That gives: B, D, F, H, J, L, N, P, R, T, V, X, Z.

Then take all letters in odd places (1st, 3rd, 5th, etc.) and write them backwards.

That gives: Y, W, U, S, Q, O, M, K, I, G, E, C, A.

Put the even letters first, then the odd letters after them.

Now count from the left to find the 10th letter. The 10th letter is T.

So, the answer is T.

22. (A) Maya walked 6 km east.

Then she turned left and walked 4 km north.

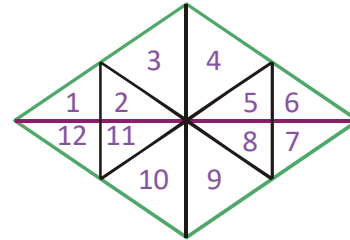
Then she turned left again and walked 6 km west.

Because she walked 6 km east and then 6 km west, she ended up in the same vertical line as where she started.

But she moved 4 km north.

So, Maya is 4 km away from the start, towards north

23. (C)



Small triangles = 12

$1 + 2, 1 + 12, 2 + 11, 12 + 11$

$5 + 6, 6 + 7, 7 + 8, 8 + 5 = 8$

$1 + 2 + 3, 12 + 11 + 10, 4 + 5 + 6,$

$7 + 8 + 9 = 4$

$1 + 2 + 3 + 4 + 5 + 6,$

$12 + 11 + 10 + 9 + 8 + 7$

$4 + 5 + 6 + 7 + 8 + 9,$

$1 + 2 + 3 + 12 + 11 + 10 = 4$

28

24. (B)

A	B	H	I	J	I	T
$\left[\begin{array}{c} +2 \\ C \end{array} \right]$	$\left[\begin{array}{c} +3 \\ E \end{array} \right]$	$\left[\begin{array}{c} +2 \\ J \end{array} \right]$	$\left[\begin{array}{c} +3 \\ L \end{array} \right]$	$\left[\begin{array}{c} +2 \\ L \end{array} \right]$	$\left[\begin{array}{c} +3 \\ L \end{array} \right]$	$\left[\begin{array}{c} +2 \\ V \end{array} \right]$

Hence,

B	R	O	T	H	E	R
$\left[\begin{array}{c} +2 \\ D \end{array} \right]$	$\left[\begin{array}{c} +3 \\ U \end{array} \right]$	$\left[\begin{array}{c} +2 \\ Q \end{array} \right]$	$\left[\begin{array}{c} +3 \\ W \end{array} \right]$	$\left[\begin{array}{c} +2 \\ J \end{array} \right]$	$\left[\begin{array}{c} +3 \\ H \end{array} \right]$	$\left[\begin{array}{c} +2 \\ T \end{array} \right]$

25. (C) $100 : 9 \rightarrow \sqrt{100} = 10 - 1 = 9$

26. (C) Step-by-step:

- 3 dice $\rightarrow 3 \times 6 = 18$ faces total
- 7 faces are visible, so 11 faces are hidden
- Count visible dots:

From the image, visible faces show these dots:

5 (left), 4 (middle front), 6 (middle top), 2 (right front), 3 (right top), 1 (left top), and 1 (middle front side)

Total = $5 + 4 + 6 + 2 + 3 + 1 + 1 = 22$

- Total of all 18 faces (3 dice) = 3 dice $\times$ (sum of all faces on a die: $1 + 2 + 3 + 4 + 5 + 6 = 21$) = 63
- Hidden dots = $63 - 22 = 41$

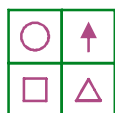
27. (B) The correct answer is disc above
Disc above is the correct answer because scab is hidden between disc and above. Disgusting they may be, but scabs help us to heal by forming a barrier against infection

28. (A) The sentence talks about not walking fast, so "lameness" (a condition causing difficulty walking) is the appropriate word formed by rearranging NESSMALE.

29. (A) P A R E N T H E S I S
 ↓ ↓ ↓ ↓
 3rd 6th 9th 10th

Since, 3rd, 6th, 9th and 10th letters are R, T, S and I respectively. Hence, only one meaningful word STIR can be formed, last letter of this word is R, so correct option is (A)

30. (A) Each element moves one step and two steps alternately clockwise direction.



COMPUTERS

31. (A) Computers were invented first, starting with early electronic computers in the 1940s-50s.

Password Login systems appeared next as computers became multi-user systems (1960s-70s).

Antivirus software was introduced later, around the late 1980s, as viruses became a threat.

CAPTCHA was created in the early 2000s to distinguish humans from bots on websites.

2FA (Two-Factor Authentication) became widely adopted after CAPTCHA, gaining popularity in the 2010s for enhanced security.

32. (D) Insert → Audio → Start on Click → Link to Slide Master

Starting audio on click means it only plays when clicked, and linking to the Slide Master is uncommon for audio playback. This method is least likely to succeed in playing audio automatically and continuously across all slides.

33. (C) You can't reorder between objects from different layers (e.g., master slide objects vs slide view). Even if you send something back, it can't go "behind" master content.

34. (A) a-iv, b-i, c-iii, d-ii

35. (B) Form_Load event runs when the form is loaded into memory before it is displayed.

36. (C) Some open-source software may require payment for support, services, or licensing even though the source code is open.

37. (C) Without LAN cards (network interface cards), the CPUs cannot connect to the network, so browsers and other internet software cannot function properly.

38. (B) LibreOffice Calc — Free and customizable
LibreOffice Calc is open-source, meaning anyone can access, modify, and redistribute its source code. This makes it highly customizable to specific needs. It's also free, which helps in reducing software costs, especially when installing on many computers.

39. (B) #VALUE!

This is a common Excel error code that appears when a formula has the wrong type of argument or operand, such as trying to perform math on text. Excel uses this and other error codes (like #DIV/0!, #REF!) to indicate different kinds of formula errors.

40. (A) Ethernet cables are commonly used in LANs to carry data, including telephone signals over IP (VoIP).

41. (A) Shows/hides a layer

42. (C) SDRAM stands for Synchronous Dynamic Random Access Memory.

43. (C) Ctrl + C copies data to the clipboard, which is a temporary storage area stored in RAM (main memory).
Ctrl + V pastes data from the clipboard back into the application.
The process does not involve writing to slower storage like SSD or HDD during copy-paste operations.
CPU cache and GPU memory are not typically involved in the clipboard operation for copying and pasting data between applications.
44. (B) Mode : Correct. Filters layers by blending mode (e.g., Normal, Multiply).
45. (B) In Ms-Word 2010, Autofit to column is not available in Insert Table Autofit behaviour.

ENGLISH

46. (C) "Optimistic" means being hopeful about the future. Its antonym is "Pessimistic", which means expecting the worst.
47. (A) A somnambulist is someone who walks in their sleep. The root "somn" refers to sleep.
48. (B) "Reluctant" means unwilling or hesitant to do something.
49. (B) The phrase "just now" refers to a very recent past action, so the simple past tense should be used instead of the present perfect. The correct sentence is:
- She left the room just now.
 - So, "has left" should be changed to "left."
50. (D) The idiom means causing unnecessary trouble or controversy.

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The End
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