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UNIFIED COUNCIL OLYMPIADS

UIC
Unified International Cyber Olympiad

UNIFIED INTERNATIONAL CYBER OLYMPIAD

CLASS - 10

Question Paper Code : 3P114

KEY

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

SOLUTIONS

MENTAL ABILITY

01. (D) Let the two sides of the triangle be x and y, then

$41^2 = x^2 + y^2 \Rightarrow x^2 + y^2 = 1681$

and $\frac{1}{2}xy = 180 \Rightarrow xy = 360$

$(x + y)^2 = x^2 + y^2 + 2xy = 1681 + 720 = 2401$

$x + y = 49 \Rightarrow x - y = \sqrt{(x+y)^2 - 4xy}$

$x - y = 31$ which is the required difference.

02. (B) Given equations are

$2x + 3y = 5$ ..... (1)

and $x - y = 10$ ..... (2)

Multiplying eq. (2) by 3 and adding eq. (1) and eq. (2), we get

$5x = 35$

$x = 7$

and $y = -3$

$\therefore$ The point (x, y) at which the submarine can be destroyed is $(7, -3)$.

03. (D) Given that the radii of three solid glass balls are 'r' cm, 6 cm and 8 cm, sum of the volumes of the three glass balls

$= \frac{4}{3}\pi r^3 + \frac{4}{3}\pi(6)^3 + \frac{4}{3}\pi(8)^3$

$= \frac{4}{3}\pi\,(r^3 + 6^3 + 8^3)\ \text{cm}^3$

The volume of the solid sphere of radius 9 cm

$= \frac{4}{3}\pi(9^3) = 243 \times 4\pi$

$\therefore \quad 243 \times 4\pi = \frac{4}{3}\pi\,(r^3 + 728)$

$729 = r^3 + 728$

$r^3 = 729 - 728 = 1$

$r = 1$

Hence, r = 1 cm

04. (A) Let the two consecutive even numbers be 'n' and (n + 2).

Then, according to the problem,

$n^2 + (n+2)^2 = 340$

$\Rightarrow n^2 + n^2 + 4n + 4 = 340$

$\Rightarrow 2n^2 + 4n + 4 = 340$

$\Rightarrow 2n^2 + 4n - 336 = 0$

$\Rightarrow n^2 + 2n - 168 = 0$

$\Rightarrow n^2 + 14n - 12n - 168 = 0$

$\Rightarrow n(n+14) - 12(n+14) = 0$

$\Rightarrow (n+14)(n-12) = 0$

$\Rightarrow n = -14 \text{ or } 12$

$\therefore$ The required numbers are 12 and 14

Their sum = 12 + 14 = 26.

05. (D) $s = \frac{a+b+c}{2} = \frac{6\text{cm} + 9\text{cm} + 5\text{cm}}{2} = 10\text{ cm}$

Area of triangle

$= \sqrt{s(s-a)(s-b)(s-c)}$

$= \sqrt{10 \times 4 \times 1 \times 5\ \text{cm}^4}$

$= \sqrt{200\,\text{cm}^4}$

$= 10\sqrt{2}\ \text{cm}^2$

06. (A)

$$
\begin{array}{r|l|l}
2x+3 & 4x^3 + 20x^2 + 33x + 18 & 2x^2 + 7x + 6 \\
 & \underline{4x^3 + 6x^2} & \\
 & (-)\ \ (-) & \\
 & 14x^2 + 33x + 18 & \\
 & \underline{14x^2 + 21x} & \\
 & (-)\ \ (-) & \\
 & 12x + 18 & \\
 & \underline{12x + 18} & \\
 & 0 &
\end{array}
$$

$\therefore$ $(2x + 3)$ is a factor

07. (C) Given 1001, 1005, ____ 9997 are the required numbers which are in Arithmetic progression.

$\therefore$ a = 1001, d = 4 & $a_n = 9997$

$\therefore$ $a_n = a + (n-1)d = 9997$

$1001 + (n-1)4 = 9997$

$(n-1)\,4 = 9997 - 1001$

$n - 1 = \frac{8996}{4} = 2249$

$n = 2249 + 1 = 2250$

$s_n = \frac{n}{2}[a + a_n]$

$= \frac{2250}{2}[1001 + 9997]$

$= \frac{2250}{2} \times \cancel{10998}^{5499}$

$= 1,23,72,750$

08. (D) Let the smallest integer be x.

Given $\frac{\cancel{30}^{15}}{\cancel{2}1}(x + x + 29) = 315$

$2x + 29 = \frac{\cancel{315}^{21}}{\cancel{15}1}$

$2x = 21 - 29 = -8$

$x = -4$

09. (C) $\frac{1}{p} + \frac{1}{q} + \frac{1}{r} = \frac{pq + qr + rp}{pqr}$

$= \frac{\left(\frac{c}{\cancel{a}}\right)}{\left(\frac{-d}{\cancel{a}}\right)} = \frac{-c}{d}$

10. (D) Required number = (LCM of 10, 9, 8 & 7) –1

= 2520 – 1

= 2519

11. (D) $3748x + 5467y = 10085$

$1731x + 7484y = 4034$

(–) (–) (–)

$2017x - 2017y = 6051$

$2017\,(x - y) = 6051$

$x - y = \frac{6051}{2017} = 3$

12. (C) Given volume of the wire = Volume of the sphere

$\pi (0.1)^2 \times h\ cm^3 = \frac{4}{3}\pi (9)^3\ cm^3$

$h = \frac{4}{3_1} \times 9^3 \times 9 \times 9 \times \frac{1}{0.1} \times \frac{1}{0.1}$

= 9,72,00 cm = 0.972 km

13. (D) Area of the path = $\frac{3}{5_1} \times 100 \times 60^{12}\ m^2$

= 3600 m^2

Let width of the path be x metres

$\therefore$ Total area = $(100 + 2x)(60 + 2x)$

= 6000 + 3600

$\Rightarrow$ $6000 + 200x + 120x + 4x^2 = 9600$

$4x^2 + 320x = 3600$

$x^2 + 80x = \frac{3600}{4}900$

$x^2 + 90x - 10x - 900 = 0$

$x(x + 90) - 10(x + 90) = 0$

$\therefore$ $x = -90$ (or) $x = 10$

$\therefore$ Width of the path = (x) = 10 m

14. (A) Given 4, 12, 20, 28 ..... 996 are in AP

Given a + (n – 1)d = 996

4 + (n – 1) (8) = 996

(n – 1) (8) = 992

(n – 1) = $\frac{992^{124}}{8}$

$\therefore$ n = 125

$\therefore$ $S_n = \frac{n}{2}(a + l) = \frac{125}{2}(4 + 996)$

= 125 × 500

= 62,500

15. (B) P(G) = 1 – P(B)

$= 1 - \frac{8}{13} = = \frac{13-8}{13}$

$P(G) = \frac{5}{13}$

Let the number of boys be 'x'

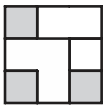
$\therefore$ Total students in the class = x + 15

$\therefore$ $P(G) = \frac{15}{x+15} = \frac{5}{13}$

$x + 15 = \frac{15 \times 13}{5} = 39$

$x = 39 - 15 = 24$

REASONING

16. (B) 

17. (B) The given expression becomes,

50 + 2 + 3 × 4 = 25 + 12 = 37

18. (A) Oat is a Rabi crop, so A = Rabi crop.

Paddy is a Kharif crop, so B = Paddy.

The correct analogy is:

Rabi crop : Oat = Kharif crop : Paddy

19. (B) 36 : 5 $\rightarrow$ $\sqrt{36} = 6 - 1 = 5$

20. (A) Let's break down the relationship step by-step:

Kiran's wife's sister = Kiran's sister-in-law.

The husband of Kiran's wife's sister = Kiran's brother-in-law (by marriage).

The man sitting there is the brother of that husband.

So, the man is the brother of Kiran's brother-in-law.

That makes the man Kiran's brother-in-law (brother of his wife's sister's husband).

21. (C) E Let's use the clues:

Clue 1: A is next to B

So A and B are not opposite.

Clue 2:

B is next to D but not next to C

So, C must be opposite to B

And since A is next to B, A is also not opposite to C.

But wait… if B is opposite to C, then A (being next to B) cannot be next to C.

So who is not next to A ?

If A is next to:

B (Clue 1)

D (Because B is next to D)

E and F (From Clue 3, E and F are on the same side as D)

Then the only face not touching A is C.

So, the face opposite to A is C

22. (D) The three columns (every 3rd char) are:

Column-1 (positions 1,4,7,…): S Q C E 2 9 3 5 B S

Column-2 (positions 2,5,8,…): K 2 F $ # L U Y 7

Column-3 (positions 3,6,9,…): 6 R 8 G 4 N V A W

RE#

Characters: R (pos6), E (pos10), # (pos14).

These are not three consecutive elements in any one of the 3 columns above, so they do not appear as a vertical triple in the 3-column arrangement. (As a side note: R, E, # do appear consecutively if you take every 4th character starting at position 2 – but that is a different spacing pattern than the intended "every 3rd / column" rule.)

Conclusion: under the 3-column rule, does NOT match.

23. (A) A = Volleyball only

B = Volleyball n Basketball (but not Football)

C = Volleyball n Basketball n Football (all three)

D = Volleyball n Football (but not Basketball)

E = Basketball only

F = Basketball n Football (but not Volleyball)

G = Football only

Now check each option:

A + D + G — Correct.

A = volleyball-only (allowed), D = VnF but not basketball (allowed), G = football-only (allowed).

None of these regions include basketball players, so this exactly matches (V ? F) \ B.

24. (D) The 1st, 2nd, 5th and 6th letters of EXCLAMATORY are:

1 = E, 2 = X, 5 = A, 6 = M ? the set {E, X, A, M}

A – correct: third letter of the only valid word EXAM is A.

25. (B) Letters given: L E P A N T.

arrange them into a meaningful word.

You can form PLANET.

In PLANET, letters are:

1st = P

2nd = L

3rd = A ← this is the answer.

26. (B) 1st letter:

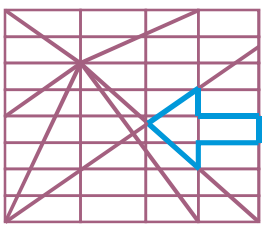
$$A \xrightarrow{+3} D \xrightarrow{+3} G \xrightarrow{+3} J \xrightarrow{+3} M$$

2nd letter:

$$Y \xrightarrow{-2} W \xrightarrow{-2} U \xrightarrow{-2} S \xrightarrow{-2} Q$$

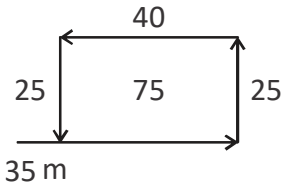
3rd letter :

$$B \xrightarrow{+3} E \xrightarrow{+3} H \xrightarrow{+3} K \xrightarrow{+3} N$$

27. (A) 

28. (D) The movements of Vamshi are as shown in figure.

Clearly, FB = DC = 40 m.

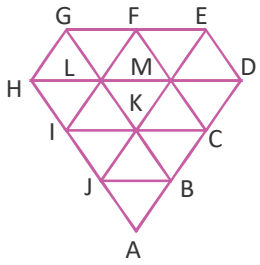


Vamshi's distance from the starting point A

= (AB – EB)

= (75 – 40) m = 35m.

29. (C) On labeling the given figure, we get



From the above figure, we see that

Number of single triangles

$\Delta HLG, \Delta LIK, \Delta LKM, \Delta FLM, \Delta FME,$

$\Delta EMD, \Delta HIL, \Delta LIK, \Delta LKM, \Delta MKC,$

$\Delta MCD, \Delta IJK, \Delta KBL, \Delta KBC$ and $\Delta JAB = 14$

Number of triangles formed from 4 small triangles =

$\Delta ACI, \Delta HMJ, \Delta LDB, \Delta GKE, \Delta ICF = 5$

Triangle formed from 9 small triangles

= $\Delta ADH = 1$

$\therefore$ Total number of triangles

= 14 + 5 + 1 = 20 triangles

Hence, option (C) is correct.

30. (C) Based on the series of figures above, they can be divided into the following groups:

Groups 1, 5, and 7 one line segment, one arrowhead, and one circle.

One arrow in groups 2, 4, and 8

One curve with an arrowhead is in groups 3, 6 and 9.

COMPUTERS

31. (B) RAM — Correct

RAM is essential for the computer to complete the POST.

If the RAM is missing or faulty, many systems will fail to beep and will not show anything on the screen, even though the fan and power supply still work.

This matches the symptoms exactly.

32. (A) Video format compatibility

Some video formats don't play in slideshow unless converted to a supported format.

33. (B) Invalid — Correct.

Because ISNUMBER(A1) is FALSE while A1<>"" is TRUE, the AND(...) is FALSE and the IF returns the "Invalid" branch.

34. (B) The first two columns will have a red background and the third column a yellow background, for all rows – Correct

<col span="2" style="background-color:red"> sets red for the first two columns (ISBN & Title).

<col style="background-color:yellow"> sets yellow for the third column (Price).

This styling applies to all rows in the table.

35. (A) Netscape: 1994

Firefox: 2002

Chrome: 2008

Edge: 2015

36. (C) <article> correct

The <article> tag in HTML5 is specifically meant for self-contained, independent content like blog posts, news articles, or forum entries.

It can be distributed or reused independently

37. (A) HTTPS uses SSL/TLS encryption to secure communication, making it harder for attackers to intercept or tamper with data.

38. (A) P-2, Q-3, R-1, S-4

Primary Key (P): A field (or combination) whose values are unique and identify each record.

Foreign Key (Q): A field in one table that refers to the primary key in another table, establishing a relationship.

Table (R): The basic structure in a DBMS that organizes data into rows and columns.

Query (S): A request to the database to fetch specific data that matches certain conditions.

39. (A) Correct C++ syntax for defining a structure.

40. (A) Keyboard → Barcode Scanner → Camera → – Correct sequence from lowest to highest complexity.

41. (A) Shows thumbnail slides for reordering and applying transitions.

42. (D) Fifth-generation computers (from the 1980s onward) focus on advanced computing technologies such as AI, parallel processing, and natural language understanding. They aim to create machines capable of reasoning and learning.

43. (A) A firewall is a security system that monitors and controls incoming and outgoing network traffic based on predetermined security rules. It protects servers and networks from attacks, including viruses, malware, and unauthorized access.

44. (A) You can reassign wood later in the program – Correct

When wood is declared as const, its value is fixed at compile time.

Changing it to int removes that restriction, so you can write wood = 20; later without a compile error.

45. (B) Memo(Long Text) – Stores up to 65,536 characters. Ideal for long descriptions, comments, or addresses that exceed short text limits.

ENGLISH

46. (C) "Stirring speech" is a common collocation meaning emotionally moving or powerful speech. The others don't fit naturally.

47. (C) "Sporadic" refers to something that happens at irregular intervals—so "occasional" is closest in meaning.

48. (C) “Cough” and “rough” both end with the /f/ sound. The others have different vowel sounds.

49. (B) The idiom "burning the midnight oil" means studying or working late at night.

50. (A) The act of breaking a law or rule is legally referred to as a violation.

The End