



Unified International Cyber Olympiad

UNIFIED INTERNATIONAL CYBER OLYMPIAD

CLASS - 10

Question Paper Code : 3B117

KEY

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

SOLUTIONS

MENTAL ABILITY

01. (C) Given $p^2 = 4q \Rightarrow$ Roots are real equal

Given '2' is a root

$\therefore$ '2' is also other of $p(x)$

02. (D) We get only once chance of 52 Mondays and 53 Sundays in a leap year among '7' changes

$\therefore$ required probability = $\frac{1}{7}$

03. (C) Given $S_{11} = \frac{11}{2}[2a + 10d]$

$$= \frac{11}{2} \times 2(a + 5d)$$

$$253 = 11(a + 5d)$$

$$\therefore a + 5d = \frac{253}{11} = 23$$

$$\therefore a_6 = 23.$$

04. (C) Let $\frac{1}{x+y} = a$ and $\frac{1}{x-y} = b$

$$\therefore 25a - 3b = 1 \quad \dots (1)$$

$$40a + 2b = 5 \quad \dots (2)$$

$$\text{eq (1)} \times 2 = 50a - 6b = 2$$

$$\text{eq (2)} \times 3 = 120a + 6b = 15$$

$$170a = 17$$

$$a = \frac{1}{10} \text{ and } b = \frac{1}{2}$$

$$\therefore x + y = 10 \text{ and } x - y = 2$$

$$\therefore x = 6 \text{ and } y = 4$$

05. (A) Let ABC be the triangular field such that AB = 20 m, AC = 34 and BC = 42 m.

$$\text{Let } \angle A = \theta_1, \angle B = \theta_2 \text{ and } \angle C = \theta_3,$$

Then, Area that can be grazed by the three horses

= (Area of sector with central angle θ_1 and radius $r = 7$ m)

+ (Area of sector with central angle θ_2 and radius $r = 7$ m)

+ (Area of sector with central angle θ_3 and radius $r = 7$ m)

$$= \frac{\pi r^2 \theta_1}{360} + \frac{\pi r^2 \theta_2}{360} + \frac{\pi r^2 \theta_3}{360} = \frac{\pi r^2}{360}$$

$$(\theta_1 + \theta_2 + \theta_3)$$

$$= \left(\frac{22}{7} \times \frac{7 \times 7}{360} \times 180 \right) \text{ m}^2$$

$$[\text{Since } \theta_1 + \theta_2 + \theta_3 = 180 \text{ and } r = 7 \text{ m}]$$

$$= 77 \text{ m}^2.$$

Now, Area of the complete triangular plot ABC

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

$$[\text{where } s = \frac{1}{2} (AB + BC + CA) = 48 \text{ m, } a =$$

$$BC = 42 \text{ m, } b = AC = 34 \text{ m, } c = AB = 20 \text{ m and so, } (s-a) = 6 \text{ m, } (s-b) = 14 \text{ m, } (s-c) = 28 \text{ m}]$$

$$= \left(\sqrt{48 \times 6 \times 14 \times 28} \right) \text{ m}^2 - 336 \text{ m}^2$$

$\therefore$ Area of the plot which remains ungrazed = $(336 - 77) \text{ m}^2 = 259 \text{ m}^2$.

06. (B) Given x, a_1, a_2, y are in AP &

$$x, b_1, b_2, y \text{ are in AP}$$

$$\therefore a_1 = b_1 \text{ \& } a_2 = b_2$$

$$\therefore \frac{a_2 - a_1}{b_2 - b_1} = \frac{b_2 - b_1}{b_2 - b_1} = 1$$

07. (B) $s = \frac{a+b+c}{2} = \frac{61\text{cm} + 102\text{cm} + 109\text{cm}}{2}$

$$= \frac{272^{136}}{2} \text{ cm}$$

$$\text{Area of } \triangle ABC = \sqrt{s(s-a)(s-b)(s-c)}$$

$$= \sqrt{136 \times 75 \times 34 \times 27} \text{ cm}^2$$

$$= \sqrt{34 \times 4 \times 25 \times 3 \times 34 \times 9 \times 3} \text{ cm}^2$$

$$= 34 \times 2 \times 5 \times 3 \times 3 \text{ cm}^2$$

$$= 3060 \text{ cm}^2$$

08. (C) Given $\alpha + \beta = -2$ & $\alpha\beta = C$

$$\text{But } (\alpha + \beta)^3 = \alpha^3 + \beta^3 + 3\alpha\beta(\alpha + \beta)$$

$$(-2)^3 = 4 + 3c(-2)$$

$$-8 = 4 - 6c$$

$$-12 = -6c \quad \therefore c = 2$$

09. (C) $\alpha\beta + \beta\gamma + \gamma\alpha = \frac{c}{a} = \frac{-11}{3}$

10. (D) Given $l + b + h = 19$ cm and

$$\sqrt{l^2 + b^2 + h^2} = 5\sqrt{5} \text{ cm}$$

$$\therefore (l + b + h)^2 = 19^2$$

$$l^2 + b^2 + h^2 + 2(lb + bh + hl) = 361$$

$$125 + 2(lb + bh + hl) = 361$$

$$2(lb + bh + hl) = 361 - 125 = 236 \text{ cm}^2$$

$$\therefore \text{TSA} = 236 \text{ cm}^2$$

11. (D) Let the height be x cm

$$\therefore \text{Radius} = \frac{2}{3}h = \frac{5}{3}x \text{ cm}$$

$$\text{CSA} = 2\pi rh = 2 \times \frac{22}{7} \times \frac{5}{3}x \times x \text{ cm}^2$$

$$= \frac{9240^{4620} \text{ paise}}{\left(\frac{2 \text{ paise}}{\text{cm}^2}\right)}$$

$$x^2 = \frac{21 \times 462}{22} \times \frac{7}{10}$$

$$x^2 = (21)^2$$

$$\text{Height } (x) = 21 \text{ cm}$$

$$\text{Radius} = \frac{5x}{3} = \frac{5 \times 21 \text{ cm}}{3} = 35 \text{ cm}$$

Volume of cylinder

$$= \pi r^2 h = \frac{22}{7} \times 35^2 \times 21 \text{ cm}^3$$

$$= 80850 \text{ cm}^3$$

12. (C) $x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$

$$= \frac{18 \pm \sqrt{324 - 4}}{2 \times 1}$$

$$= \frac{18 \pm \sqrt{320}}{2}$$

$$= \frac{18 \pm 8\sqrt{5}}{2}$$

$$x = 9 \pm 4\sqrt{5}$$

13. (C) Base area = $\frac{1}{2} \times h (a + b)$

$$= \frac{1}{2} \times 32 \text{ m} (4.5 + 2.5) \text{ m} = 112 \text{ mts}^2$$

Volume of the pool = Base area $\times$ breadth

$$= 112 \text{ mts}^2 \times 9.5 \text{ mts} = 1064 \text{ mts}^3$$

14. (B) $\frac{2}{a+b+1} = \frac{3}{a+2b+2} = \frac{7}{4a+4b+1}$

$$\therefore \frac{2}{a+b+1} = \frac{3}{a+2b+2}$$

$$\Rightarrow 2a + 4b + 4 = 3a + 3b + 3$$

$$a - b = 1 \quad \dots\dots\dots (1)$$

$$\frac{3}{a+2b+2} = \frac{7}{4a+4b+1}$$

$$\Rightarrow 12a + 12b + 3 = 7a + 14b + 14$$

$$5a - 2b = 11 \rightarrow (2)$$

$$2a - 2b = 2 \rightarrow (1) \times 2$$

Solving eq (1) & (2) we get : $3a = 9$

$$\Rightarrow a = 3$$

$$b = 2$$

15. (D) Let number of green marbles be ' x '

Given $\frac{x}{15+27+x} = \frac{1}{7}$

$$7x = x + 42$$

$$6x = 42$$

$$\therefore \text{No. of green marbles } (x) = \frac{42}{6} = 7$$

$$\therefore \text{Total marbles} = 15 + 27 + 7 = 49$$

Given 5 green marbles are taken from bag

$$\therefore \text{Total marbles} = 49 - 5 = 44 \text{ and}$$

$$\text{Total green marbles} = 7 - 5 = 2$$

$\therefore$ Probability of drawing a green marble

$$= \frac{2}{44} = \frac{1}{22}$$

REASONING

16. (C) Each diagonal line of numbers, starting with the top left hand corner number, increases by 1 each time, ie :

4

$$2 + 3 = 5$$

$$2 + 1 + 3 = 6$$

$$2 + 1 + 2 + 2 = 7$$

$$4 + 1 + 3 = 8$$

$$5 + 4 = 9$$

10

17. (A) Late are

Tear is formed from option (A)

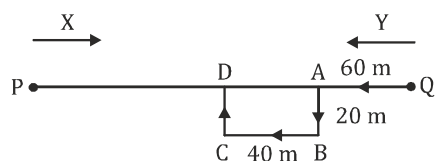
18. (D)



19. (A) 1 cube

20. (C) HLE P ATHLETES

21. (C)



Clearly Y moves 60 m from Q upto A, then 20 m upto B, 40 m upto C and then upto D.

So, $AD - BC = 40$ m.

$$QD = (60 + 40) \text{ m} = 100 \text{ m}.$$

Since A and B travel with the same speed, A will travel the same speed along the horizontal as B travels in the same time. i.e., $(60 + 20 + 40 + 20) = 140$ m.

So, X travels 140 m upto A.

$$\text{Distance between X and Y} = AD - (100 - 60) \text{ m} = 40 \text{ m}.$$

22. (D) Option (A): ASSEMBLE, BEAMLESS

Option (B): MINGER

Option (C): ABOARD, ABROAD

Option (D): No word formed with USAGRDNN

23. (D) M, The second, fifth, tenth and twelfth letters of the word METROPOLITAN are E, O, T and N respectively. The words formed are NOTE and TONE.

BK50RP62

24. (B)

BK20RB62

25. (D) Suppose I have t daughters. Then I have $2t$ sons. Each daughter will have same number of brothers as I have sons. Therefore $2t$ brothers. And each daughter will have $(t - 1)$ sisters.

So according to question

Number of Brothers = $3 \times$ Number of Sisters

$$2t = 3(t - 1) \Rightarrow 2t = 3t - 3$$

$$t = 3$$

Therefore I have $2t = 6$ sons

26. (B) Clearly, $90 = 3 \times 30$, $180 = 30 \times 6$, $12 = 6 \times 2$, $50 = 2 \times 25$, $100 = 25 \times 4$, $200 = 4 \times 50$

So, missing term = $3 \times 50 = 150$

90, 180, 12, 50, 100, 200, 150, 3, 50, 4, 25, 2, 6, 30, 3

27. (D) D is faced outside in option (D)

So, option (D) is different.

28. (C) My grand mother's only daughter means Anu's 'mother'.

Her mother's only son means Anu's brother.

$\therefore$ The man is Anu's brother.

29. (B)



30. (C) 2 adjacent numbers are 3, 4, 1, 6

$\therefore$ 2 opposite number is 5

COMPUTERS

31. (A) EDVAC (Electronic Discrete Variable Automatic Computer) — used vacuum tubes, first generation.
- IBM-1401 — second generation (transistors).
- CDC-1604 — second generation (transistors).
- ICL-2900 — third generation (integrated circuits).
32. (A) MS-Access is a DBMS software.
33. (C) PowerPoint 4.0 → Released in 1994 (valid).
- PowerPoint XP → Released in 2001 as part of Microsoft Office XP (valid).
- PowerPoint 3.5 → No such version; versions were 3.0 (1992), then 4.0 (1994).
- PowerPoint 2000 → Released in 1999 as part of Office 2000 (valid).
- The one that is not a valid version is (C) Powerpoint 3.5.
34. (A) In order to transfer information from one computer to another, each computer needs an identity which is called “internet protocol address” or IP address.
35. (D) The Navigation Pane in MS Access 2007 shows all the tables, queries, forms, and reports in the database.
- Database window was used in earlier versions, but not in Access 2007.
- Query window and Design view window are specific to designing queries or objects, not the main command centre.
36. (B) Utility programs help maintain, analyze, optimize, or protect the computer system.
- Examples: Disk defragmenter, antivirus, backup tools.
- Operating system manages hardware and software.

Packages are application software suites.

Compilers convert code from high-level language to machine code.

37. (D) Both (ii) and (iii)
- (ii) Press the Home key → jumps to the first slide.
- (iii) Right click → See All Slides → click first slide → also works.
- (i) is incorrect because “Go to Slide → first slide in the list” is not the correct navigation option.
38. (D) In HTML, to create a clickable email link, you use the mailto: protocol inside the <a> tag.
- Example:
- ```
 Send Email
```
- Clicking this link will open the user’s default email client to send an email.
- Options (A), (B), and (C) are incorrect HTML syntax for email links.
39. (B) Twitter is an American micro blogging and social networking service on which users post and interact with messages known as “tweets”.
40. (C) 32 MB is the minimum requirement of RAM per internet access.
41. (C) 1. On the create tab, in the queries group, click Query Wizard.
2. In the New Query dialogue box, click Simple Query Wizard, and then click ok.
42. (B)  $= \text{sum}(D_1 : D_5)$  is used to add all numbers in a range of cells where as in option (A, C) the function add only two numbers.
43. (B) ‘OL’ is used in HTML to order a list.
44. (C) In C++, the logical AND operation is performed by the && operator.
- & → Bitwise AND
- || → Logical OR
- + → Addition
45. (B) (PRINT)

## ENGLISH

46. (C)
47. (C)
48. (B) 'Zero' the figure, is the synonym of 'Nought'.
49. (C)
50. (D) 'a, an' is the correct answer. We decide to use an article based on the vowel/ consonant sound the first syllable of a word produces. In 'one-way' the sound produced is that of 'won', which is a consonant sound, hence the article 'a'. In case of 'hour', the sound produced is that of 'our', which is a vowel sound, hence the article 'an'.

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