



Unified International Cyber Olympiad

UNIFIED INTERNATIONAL CYBER OLYMPIAD

CLASS - 09

Question Paper Code : 3P124

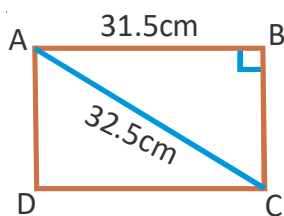
KEY

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

SOLUTIONS

MENTAL ABILITY

01. (B)



In $\triangle ABC$, $\angle ABC = 90^\circ$

$$\therefore AC^2 = AB^2 + BC^2$$

$$1056.25 = 992.25 + BC^2$$

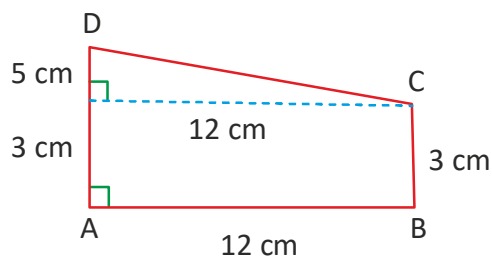
$$BC^2 = 1056.25 - 992.25 = 64 = 8^2$$

$$\therefore BC = 8 \text{ cm}$$

$$\text{Area of the rectangle} = AB \times BC$$

$$= 31.5 \times 8 \text{ cm}^2 = 252 \text{ cm}^2$$

02. (B)



Const : Draw $CE \parallel AB$

$\therefore ABCE$ is a rectangle

$$\therefore CE = AB = 12 \text{ cm}$$

$$\therefore AE = BC = 3 \text{ cm}$$

$$\therefore DE = AD - AE = 5 \text{ cm}$$

In $\triangle CDE$, $\angle E = 90^\circ$

$$\therefore CD^2 = DE^2 + CE^2 = 12^2 + 15^2$$

$$CD = \sqrt{169} \text{ cm} = 13 \text{ cm}$$

03. (D)
$$\frac{1}{(x^2 - 3x - 28)} - \frac{1}{(2x^2 - 17x + 21)}$$

$$= \frac{1}{(x-7)(x+4)} - \frac{1}{(x-7)(2x-3)}$$

$$= \frac{(2x-3) - (x+4)}{(x-7)(x+4)(2x-3)}$$

$$= \frac{2x-3-x-4}{(x-7)(x+4)(2x-3)}$$

$$= \frac{\cancel{(x-7)}}{\cancel{(x-7)}(x+4)(2x-3)}$$

$$= \frac{1}{(2x^2 + 5x - 12)}$$

04. (B) Let x men are needed to finish the construction of the house in 51 days.

Number of men	102	x
Number of days	84	51

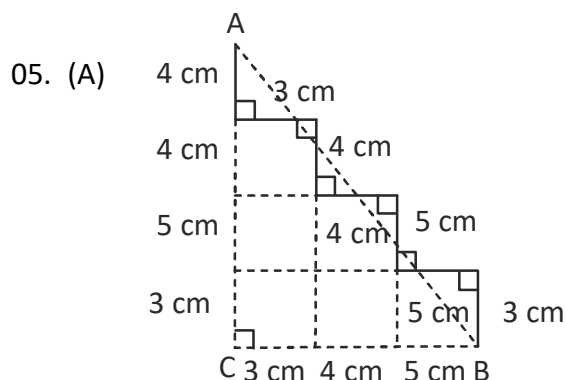
More the number of men, less the number of days taken to build the house.

So, it is a case of indirect proportion.

$$\therefore x_1 y_1 = x_2 y_2$$

$$102 \times 84 = 51x$$

$$x = \frac{102 \times 84}{51} = 168$$



$$\therefore AC = (4 + 4 + 5 + 3) \text{ cm} = 16 \text{ cm}$$

$$BC = (3 + 4 + 5) \text{ cm} = 12 \text{ cm}$$

$$\text{In } \triangle ABC, \angle C = 90^\circ \Rightarrow AB^2 = AC^2 + BC^2$$

($\because$ pythagurus theorem)

$$= (16 \text{ cm})^2 + (12 \text{ cm})^2$$

$$= (256 + 144) \text{ cm}^2$$

$$= 400 \text{ cm}^2$$

$$AB^2 = (20 \text{ cm})^2$$

$$\therefore AB = 20 \text{ cm}$$

06. (D) Area = side $\times$ side

$$= \frac{9}{16} x^2 + \frac{25}{36} y^2 - \frac{5}{4} xy \text{ sq. units}$$

$$= \left(\frac{3}{4}x\right)^2 + \left(\frac{5}{6}y\right)^2 - 2 \times \frac{3}{4}x \times \frac{5}{6}y$$

$$= \left(\frac{3}{4}x - \frac{5}{6}y\right)^2 \text{ sq. units}$$

$$= \left(\frac{3}{4}x - \frac{5}{6}y\right) \left(\frac{3}{4}x - \frac{5}{6}y\right) \text{ sq. units}$$

$$\therefore \text{Side} = \left(\frac{3}{4}x - \frac{5}{6}y\right) \text{ units}$$

07. (C) Given

$$A : B = \frac{1}{2} : \frac{3}{8} = \frac{1}{2} \times \frac{8}{3} : \frac{3}{8} \times \frac{8}{3} = 4 : 3$$

$$B : C = \frac{1}{3} : \frac{5}{9} = \frac{1}{3} \times \frac{9}{5} : \frac{5}{9} \times \frac{9}{5} = 3 : 5$$

$$\therefore A : B : C = 4 : 3 : 5$$

08. (D) Mean = $\frac{\text{sum of observations}}{\text{Total no. of observations}}$

$$\Rightarrow 82 = \frac{27 + x + 31 + 89 + x + 107 + x + 156 + x}{5}$$

$$\Rightarrow 410 = 5x + 410$$

$$\Rightarrow 0 = 5x$$

$$\Rightarrow x = 0$$

Now, New Mean =

$$\frac{130 + x + 126 + x + 68 + x + 50 + x + 1 + x}{5}$$

$$= \frac{130 + 126 + 68 + 50 + 1}{5}$$

$$= \frac{375}{5}$$

$$= 75$$

09. (B) Mid point of QS =

$$\left(\frac{6+18}{2}, \frac{10+10}{2} \right) = (12, 10)$$

Given (12, 10) be the midpoint of PR.

Let R be (x, y)

$$\therefore \left(\frac{10+x}{2}, \frac{4+y}{2} \right) = (12, 10)$$

$$\frac{10+x}{2} = 12 \text{ and } \frac{y+4}{2} = 10$$

$$\therefore 10+x = 24 \text{ and } y+4 = 20$$

$$\Rightarrow x = 24 - 10 \text{ and } y = 20 - 4 = 16$$

$$x = 14 \text{ and } y = 16$$

$$\therefore R = (x, y) = (14, 16)$$

10. (D) If $x = 0$, then $3(0) + 4y = 12$

$$4y = 12$$

$$y = 3$$

$$\therefore y\text{-intercept} = 3$$

11. (B) $\sqrt{3} = 1.732$

12. (A) $\angle PQR = 90^\circ$ [$\therefore$ Angle in a semi circle]

$$\therefore \angle QPR + \angle QRP = 90^\circ$$

$$\angle QPR + 30^\circ = 90^\circ$$

$$\angle QPR = 60^\circ$$

$$\therefore \angle TPR = 100^\circ - 60^\circ = 40^\circ$$

$$\text{But } \angle TPR + \angle x = 180^\circ$$

$$40^\circ + x = 180^\circ$$

$$x = 140^\circ$$

13. (C) CP of each apple be Rs. x

$$\text{CP of 110 apples} = 110x.$$

$$\text{Given SP of 100 apples} = 110x$$

$$\text{SP of each apple} = \frac{110x}{100}$$

$$\text{Profit} = \text{SP} - \text{CP} = \frac{11x}{10} - x = \left(\frac{x}{10} \right)$$

$$\text{Profit}\% = \frac{\text{profit}}{\text{CP}} \times 100$$

$$= \left(\frac{x}{10} \right) \times 100 = 10\%$$

14. (B) Option 'B' is the top view of the given solid

$$15. (C) 2^{4(x^2+3x-1)} = 2^{3(x^2+3x+2)}$$

$$4x^2 + 12x - 4 = 3x^2 + 9x + 6$$

$$\Rightarrow x^2 + 3x - 10 = 0$$

$$\text{or } (x+5)(x-2) = 0$$

$$\therefore x = -5, 2$$

$$\text{Sum of all values of "x"} = -5 + 2 = -3$$

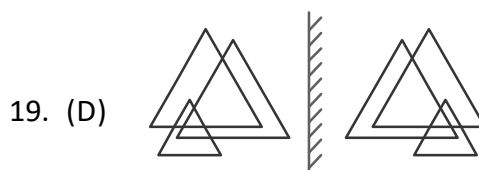
REASONING

16. (C) The second, fourth and sixth letters of the words remain unchanged, while the first, third and fifth letters are each moved one step backward to obtain the corresponding letters of the code.

17. (B) Replace each symbol with its corresponding operation and apply the BODMAS rule. Thus,

$$12 + 3 \times 2 - 32 \div 4 = 12 + 6 - 8 = 10$$

18. (C) Ranjan is 8th from the left, so Priyanshi is 9th. Ashoka is five places to the right of Priyanshi, so Ashoka is 14th from the left.



20. (B) P is the father of Q, Q is the mother of R, and R is the brother of S. Therefore, P is the grandfather of S,

21. (B) Since P is 2 km north of T and S is 1 km south of P, S lies 1 km north of T. Thus, P, S, and T are aligned on the same north-south straight line



23. (B)



24. (A) UDLEPD rearranges to form PUDDLE, which means a small pool of water.

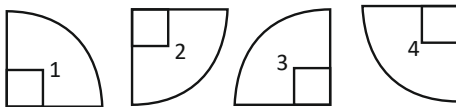
25. (B) $2,3 \rightarrow 23 + 5 = 28$

$4,5 \rightarrow 45 + 5 = 50$

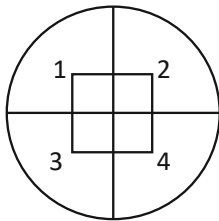
and $3,5 \rightarrow 35 + 5 = 40$

Hence the missing number is 40.

26. (B) Given shapes can be labelled as



The figure formed by the given shapes is

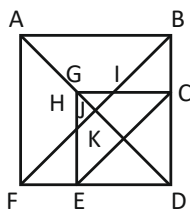


27. (D)

hear	The answer is hear, found in 'the arrow'.
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28. (D) The lines inside the shapes are all of equal length except option D.

29. (D) The figure may be labelled as shown.



The simplest triangles are EFH, BIC, GHJ, GIJ, EKD and CKD i.e., 6 in number.

The triangles composed of two components each are ABJ, GCK, GEK, CED and GHI i.e., 6 in number.

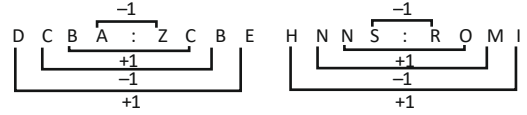
The triangles composed of three components each are GCD/GED, DJB and DJF i.e., 4 in number.

The triangles composed of four components each are ABF and GCE i.e., 2 in number.

The triangles composed of five components each are ABD and AFD i.e., 2 in number. There is only one triangle i.e., FBD composed of six components.

$\therefore$ Total number of triangles in the figure = $6 + 6 + 4 + 2 + 2 + 1 = 21$

30. (A)



COMPUTERS

31. (B) In sequential data access, records are read in order, so the preceding records must be accessed before the last record can be retrieved.

32. (C) The requirement states that every computer must directly communicate with every other computer without using any central device.

This is exactly how Mesh Topology works—each node is directly connected to every other node.

Correct answer option C (Mesh Topology)

33. (C) The Lasso Tool selects an irregular portion of a drawing, allowing only the selected part to be modified while leaving the rest unchanged.

34. (A) Trace Precedents

The arrows are showing the cells that provide values to the active cell (F2). This is the result of using the Trace Precedents command.

35. (B) Compilers, assemblers, linkers, and utility programs are system software but are not operating systems.

36. (A) Only open-source software guarantees access to the source code, allowing users to inspect, modify, and redistribute it according to the license. Features such as online updates, multi-core processor support, and security mechanisms can be found in both open-source and proprietary software, so they are not distinguishing characteristics.

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|--|--|
| <p>37. (A) This icon represents 'From Current Slide'. It is used to start the slide show from the slide that is currently selected.</p> <p>38. (B) The StyleRef field displays text formatted with a specified style (such as Heading 1) in the header and updates automatically whenever the heading changes.</p> <p>39. (A) Theme is an MS FrontPage web-authoring feature, while Caption is a Visual Basic GUI property.</p> <p>40. (A) A Decision symbol is used to test a condition and direct the flowchart along different paths. Here, it checks the user's choice and branches to calculate either the area or the perimeter of the rectangle.</p> <p>41. (A) PSD is Photoshop's native file format. It preserves layers, masks, editable text, and other editing features, unlike JPEG, PNG, or GIF.</p> | <p>42. (B) Satellite communication relies on signals travelling between Earth stations and satellites. Heavy rain and storms can weaken these signals, a phenomenon known as rain fade.</p> <p>43. (A) Ctrl + Alt + Del
It provides access to system options, including Task Manager.</p> <p>44. (D) IBM System/360
IBM System/360 is a third-generation computer based on integrated circuits, whereas the others are second-generation computers.</p> <p>45. (B) A String data type stores text, including letters, numbers, spaces, and symbols. Therefore, "Olympiad Grade 9" is stored as a String.</p> |
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- ENGLISH**
46. (A)
47. (C)
48. (A)
49. (B)
50. (C)

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