



Time : 2½ hrs.

M.M.:80

Note: (1) There are two sections 'A' and B.

(2) Attempt all questions from section - A and any four questions from section - B.

SECTION – A (40 Marks)**(Attempt all the questions)****Q1. Multiple choice questions. (Do not show any working): [1×15=15]**

- (i)** If $x + \frac{1}{x} = 3$, then the value of $x^2 + \frac{1}{x^2} + 3$ is :
- (a) 7 · · · · · (b) 10
(c) 9 · · · · · (d) 0

- (ii)** What are the factors of the expression : $y^3 - 343$?
- (a) $(y - 3)(y^2 + 9 + 3y)$
(b) $(y - 6)(y^2 + 36 + 6y)$
(c) $(y - 7)(y^2 + 49 + 14y)$
(d) $(y - 7)(y^2 + 49 + 7y)$

- (iii)** What is the simplest value of $\frac{1}{6-\sqrt{5}}$?
- (a) 1 · · · · · (b) $\frac{(6+\sqrt{5})}{29}$
(c) $\frac{(6+\sqrt{5})}{31}$ · · · · · (d) $\frac{(6+\sqrt{5})}{37}$

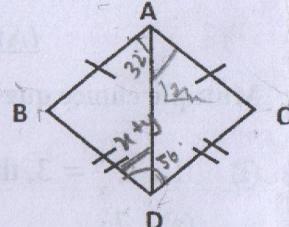
- (iv)** If $4 \cos A = 3$, what is the value of : $(\tan^2 A - \sec^2 A)$
- (a) 1 · · · · · (b) -1
(c) 0 · · · · · (d) $\frac{9}{16}$

(v) If $\sin A = \cos A$ and A is an acute angle, then the value of A is :

- (a) 45°
- (b) 60°
- (c) 90°
- (d) 0°

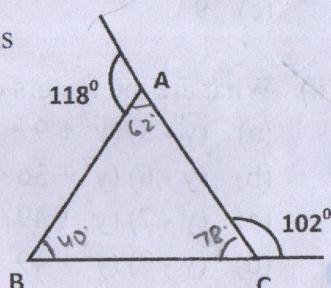
(vi) In the given figure, $\angle BAD = 32^\circ$, $\angle BDC = 56^\circ$, $\angle CAD = (2x)^\circ$ and $\angle BDA = (x+y)^\circ$, then the values of x and y respectively are:

- (a) $16^\circ, 12^\circ$
- (b) $14^\circ, 10^\circ$
- (c) $12^\circ, 10^\circ$
- (d) $15^\circ, 12^\circ$



(vii) In the adjoining figure, which is the largest side of $\triangle ABC$?

- (a) AB
- (b) BC
- (c) AC
- (d) Can't say



(viii) Which of the following statements is incorrect?

- (a) A median of a triangle divides it into two triangles of equal area.
- (b) A diagonal of a parallelogram divides it into two triangles of equal area.
- (c) Both diagonals of a rhombus divide it into four triangles of equal area.
- (d) Both diagonals of a trapezium divide it into four triangles of equal area.

(ix) The class marks of a frequency distribution are 10, 15, 20, 25, What is the class corresponding to the class mark 20?

- (a) 15 – 25
- (b) 10 – 30
- (c) 17.5 – 22.5
- (d) 12.5 – 27.5

(x) If the volume of a cube is 216 cm^3 , then what is the value of its lateral surface area?

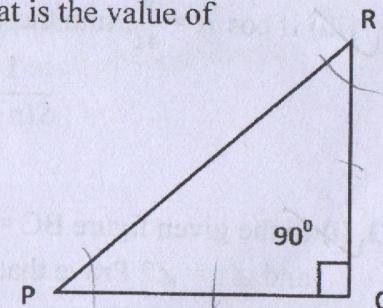
- (a) 144 cm^2
- (b) 216 cm^2
- (c) 306 cm^2
- (d) 512 cm^2

(xi) What is the value of y-intercept from the equation $x + y = 0$?

- (a) 0
- (b) 1
- (c) -1
- (d) infinite

(xii) The given figure, shows an isosceles triangle with angle $\angle PQR = 90^\circ$. What is the value of $\angle PRQ$?

- (a) 30°
- (b) 45°
- (c) 60°
- (d) 40°



(xiii) If $A + B = 90^\circ$. What is the value of $\frac{\cos A}{\sin B}$?

- (a) 1
- (b) -1
- (c) 0
- (d) infinite

(iv) From the following pairs of sides, which pair does not make a right angled triangle

- (a) 5cm, 4cm, 3cm (b) 10cm, 8cm, 6cm
 (c) 12cm, 13cm, 10cm (d) 25cm, 24cm, 7cm

(v) What is value of expression: $\{(3x^2yz)^3\}^0$

- (a) 1 (b) 0
 (c) -1 (d) 3

Q.2. (i) By rationalising the denominator, find the value correct upto two significant figures: (Given $\sqrt{2} = 1.414$)

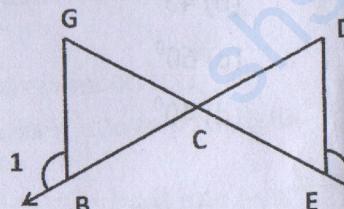
$$\frac{1}{3 - \sqrt{2}}$$

(ii) If $a + b = 7$ and $ab = 6$, evaluate: $(a^2 - b^2)$

(iii) If $\cos A = \frac{9}{41}$; find the value of:

$$\frac{1}{\sin^2 A} - \cot^2 A$$

Q.3. (i) In the given figure $BC = CE$ and $\angle 1 = \angle 2$ Prove that, $\triangle GCB \cong \triangle DCE$ [4]



(ii) The volume of a cuboidal solid is 10368 cm^3 . If its dimensions are in the ratio $3 : 2 : 1$, find the cost of polishing its total surface at the rate of Rs. 2.50 per m^2 .

Answer

(vi) Use a graph paper.

Construct a cumulative frequency distribution table from the following: [5]

CI	10-20	20-30	30-40	40-50	50-60	60-70
Frequency	15	21	26	18	13	15

Also draw frequency polygon.

SECTION – B (40 Marks)

(Attempt any four questions)

4. (i) Factorise: $b^2 + c^2 + 2bc - a^2$ [3]

(ii) Show that the point (2, 2) is equidistant from the points (-1, -2) and (-3, 2). [3]

(iii) Evaluate: $\log \frac{81}{8} - 2 \log \frac{3}{2} + 3 \log \frac{2}{3} + \log \frac{3}{4}$

Give reasons for your steps. [4]

5. (i) The mean of certain number of observations is 35. What is the new value of the mean if each observation is:

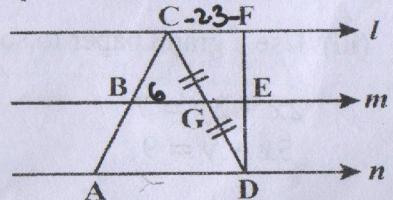
- (a) increased by 6
 (b) decreased by 7
 (c) multiplied by 2

Give reasons.

(ii) In the following figure, straight lines l, m and n are parallel to each other and G is the midpoint of CD. Find: [3]

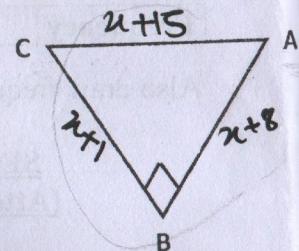
- (a) BG if $AD = 12\text{cm}$
 (b) CF if $GE = 4.6\text{cm}$
 (c) AB if $BC = 4.8\text{ cm}$

Give reasons.



- (iii)** Find the amount on Rs. 36,000 after 2 years, compounded annually, the rate of interest being 10% for the first year and 12% for the second year.

- Q.6. (ii)** In the following figure, $\angle ABC = 90^\circ$, $AB = (x+8)$ cm, $BC = (x+1)$ cm and $AC = (x+15)$ cm. Find the sides of the triangle. [3]



- (ii)** In a quadrilateral ABCD angles A, B, C and D are in the ratio $3 : 2 : 1 : 4$.

(a) Find the angles.

(b) Prove that AD is parallel to BC.

Q. (iii) Solve: $8x + 13y - 29 = 0$
 $12x - 7y - 17 = 0$

- Q.7. (i)** Using ruler and compass only construct a parallelogram ABCD with diagonals 6.3cm and 5.6cm and acute angle between the diagonals is 45° . [3]

(i) Solve for x and y :

$$3^x \times 3^{-y} = 9 \text{ and}$$

$$2^y \times 4^{-x} = \frac{1}{8}$$

(iii) Use a graph paper to solve :

$$2x - 3y = 7$$

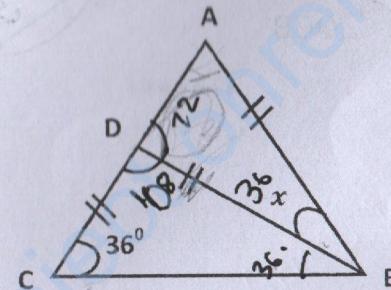
$$5x + y = 9$$

- Q.8. (i)** If $x = 30^\circ$, verify that:

$$\tan 2x = \frac{2 \tan x}{1 - \tan^2 x}$$

[3]

- (ii)** Use the given figure to find the angle 'x'.



[3]

Given reasons. [3]

- [4] (iii)** Calculate the area of a triangle whose sides are 13cm, 5cm and 12cm. Hence, calculate the altitude corresponding to the longest side of this triangle. [4]

- [3].9. (i)** ABCD is a parallelogram of area 162cm^2 . P is a point on AB such that $AP : PB = 1:2$. [3]

Calculate :

(a) the area of ΔAPD .

(b) the ratio PA : DC.

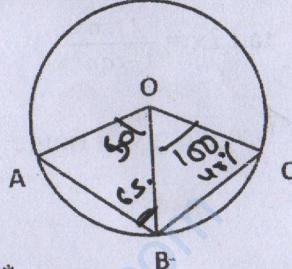
[4] (ii) Evaluate:
$$\frac{\sec 42^\circ}{\csc 48^\circ} + \frac{3 \tan 50^\circ}{\cot 40^\circ} - \frac{2 \cos 43^\circ}{\sin 47^\circ}$$
 [3]

Write all the steps and give reasons.

(iii) In the given figure, arc AB : arc BC = 2:3 and

$$\angle AOC = 150^\circ$$

- Find:
- (a) $\angle AOB$
 - (b) $\angle BOC$
 - (c) $\angle OBA$
 - (d) $\angle OCB$



[4]