

## ICSE CLASS 10<sup>TH</sup> SEMESTER 2 Maths EXAM 2022

### SECTION-A

**Question 1:**

**(i) The Probability of getting a number divisible by 3 in throwing a dice is:**

- (a)  $1/6$**
- (b)  $1/3$**
- (c)  $1/2$**
- (d)  $2/3$**

**(ii) The volume of a conical tent is  $462 \text{ m}^3$  and the area of the base is  $154 \text{ m}^2$ . The height of the cone is:**

- (a) 15m**
- (b) 12m**
- (c) 9m**
- (d) 24**

**(iii) The median for the give distribution is:**

| Class Interval | 0 – 10 | 10 – 20 | 20 – 30 | 30 – 40 |
|----------------|--------|---------|---------|---------|
| Frequency      | 2      | 4       | 3       | 5       |

- (a) 0 – 10**
- (b) 10 – 20**
- (c) 20 – 30**
- (d) 30 – 40**

**(iv) If two lines are perpendicular to one another then the relation between their slopes  $m_1$  and  $m_2$  is:**

- (a)  $m_1 = m_2$**
- (b)  $m_1 = 1/m_2$**
- (c)  $m_1 = -m_2$**
- (d)  $m_1 \times m_2 = -1$**

**(v) A lighthouse is 80m height. The angle of elevation of its top from a point 80m away from its foot along the same horizontal line is:**

- (a)  $60^\circ$**
- (b)  $45^\circ$**
- (c)  $30^\circ$**
- (d)  $90^\circ$**

**(vi) The modal class of a given distribution always corresponds to the:**

- (a) Interval with highest frequency**
- (b) Interval with lowest frequency**
- (c) The first interval**
- (d) The last interval**

**(vii) The coordinates of the point  $(-3, 5)$  on reflecting on the x axis are:**

- (a)  $(3, 5)$**
- (b)  $(-3, -5)$**
- (c)  $(3, -5)$**
- (d)  $(-3, 5)$**

**(viii) ABCD is a cyclic quadrilateral. If  $\angle BAD = (2x + 5)^\circ$  and  $\angle BCD = (x + 10)^\circ$  then x is equal to:**

- (a)  $65^\circ$
- (b)  $45^\circ$
- (c)  $55^\circ$
- (d)  $5^\circ$

(ix) A (1, 4), B (4, 1) and C (x, 4) are the vertices of  $\Delta ABC$ . If the centroid of the triangle is G (4, 3) then x is equal to:

- (a) 2
- (b) 1
- (c) 7
- (d) 4

(x) The radius of a roller 100 cm long is 14 cm. The curved surface area of the roller is:

(Take  $\pi = 22/7$ )

- (a)  $13200 \text{ cm}^2$
- (b)  $15400 \text{ cm}^2$
- (c)  $4400 \text{ cm}^2$
- (d)  $8800 \text{ cm}^2$

## Section B

### Question 2

(i) Prove that:

$$\frac{1}{1+\sin\theta} + \frac{1}{1-\sin\theta} = 2\sec^2\theta$$

(ii) Find 'a', if A (2a + 2, 3), B (7, 4) and C (2a + 5, 2) are collinear.

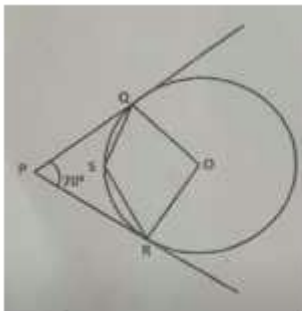
(iii) Calculate the mean of the following frequency distribution.

|                |        |         |         |         |         |
|----------------|--------|---------|---------|---------|---------|
| Class Interval | 5 – 15 | 15 – 25 | 25 – 35 | 35 – 45 | 45 – 55 |
| Frequency      | 2      | 6       | 4       | 8       | 4       |

(iv) In the given figure O is the centre of the circle. PQ and PR are tangents and  $\angle QPR = 70^\circ$ . Calculate

(a)  $\angle QOR$

(b)  $\angle QSR$

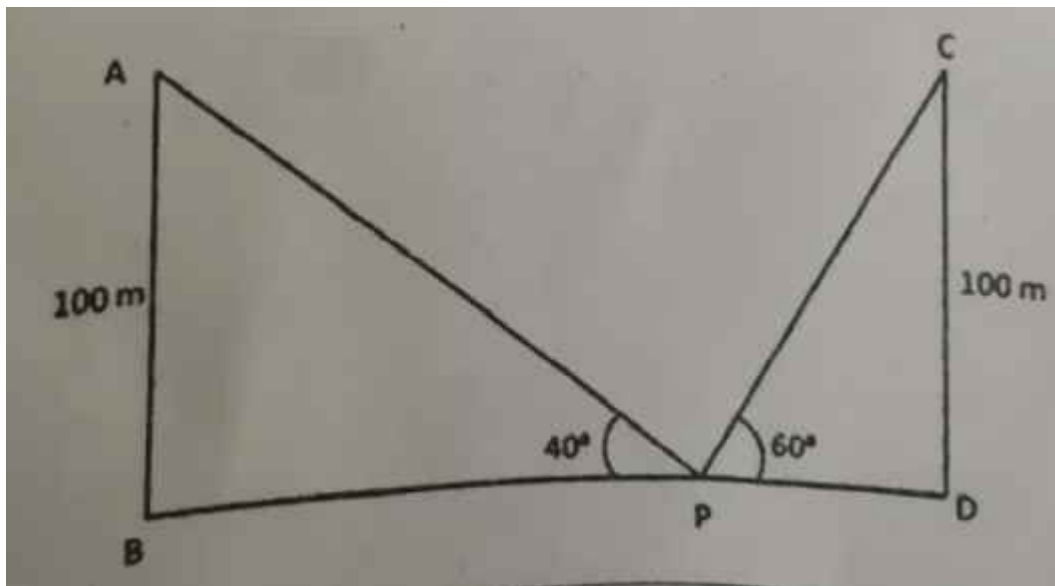


### Question 3

(i) The bag contains 5 white, 2 red and 3 black balls. A ball is drawn at random. What is the probability that the ball drawn is a red ball?

(ii) A solid cone of radius 5 cm and height 9 cm is melted and made into small cylinders of radius of 0.5 cm and height 1.5 cm. find the number of cylinders so formed.

(iii) Two lamp posts AB and CD each of height 100 m are on either side of the road. P is a point on the road between the two lamp posts. The angle of elevation of the top of the lamp posts from the point P are 60 and 40. Find the distance PB and PD.



iv) Marks obtain by 100 students in an examination are given below.

| Marks           | 0-10 | 10-20 | 20-30 | 30-40 | 40-50 | 50-60 |
|-----------------|------|-------|-------|-------|-------|-------|
| No. of students | 5    | 15    | 20    | 28    | 20    | 12    |

Draw a histogram for the given data using graph paper and find the mode. Take 2 cm = 10 mark along one axis and 2 cm = 10 students along the other axis.

**Question 4:**

(i) Find a point P which divides internally the line segment joining the points A (-3, 9) and B (1, -3) in the ratio 1:3.

(ii) A letter of the word 'SECONDARY' is selected at random. What is the probability that the letter selected is not a vowel?

(iii) Use a graph paper for this question. Take  $2\text{cm} = 1$  unit along both axes.

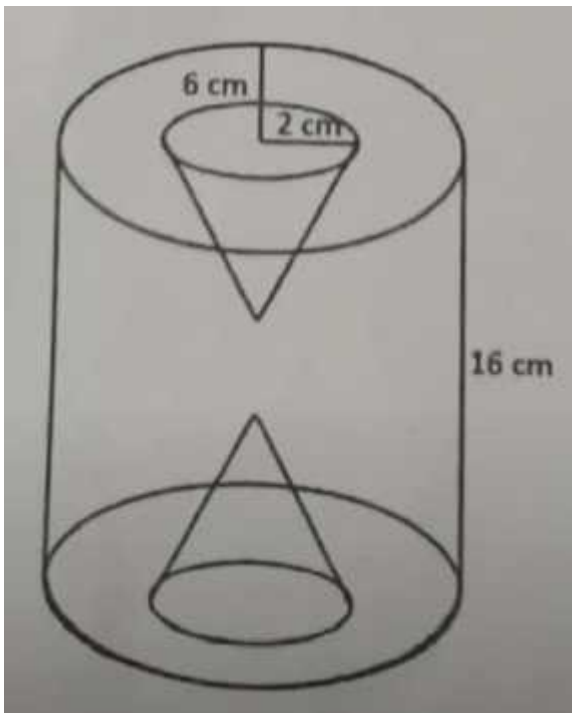
(a) Plot the points A (0, 4), B (2, 2), C(5, 2) and D (4, 0), E (0, 0) is the axes.

(b) Reflect B, C, D on the y-axis and name them as B', C' and D' respectively.

(c) Join the points ABCDD'C'B' and A in order and give a geometrical name to the closed figure.

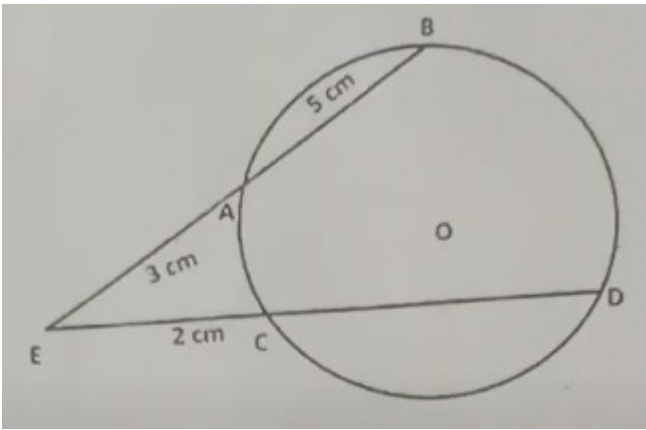
(iv) A solid wooden cylinder is of radius 6cm and height 16cm. Two cones each of radius 2cm and height 6cm are drilled out of the cylinder. Find the volume of the remaining solid.

Take  $\pi = 22/7$

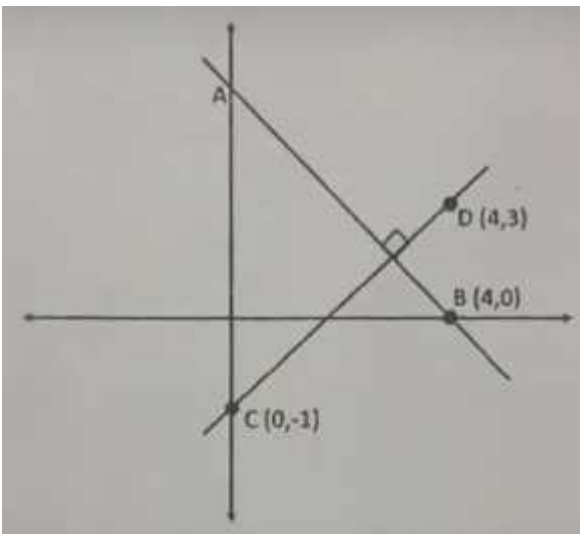


**Question 5:**

(i) Two chords AB and CD of a circle intersect externally at E. If  $EC = 2$  cm,  $EA = 3$  cm and  $AB = 5$  cm, Find the length of CD.



(ii) Line AB is perpendicular to CD. Coordinates of B, C and D are respectively (4 0), (0, -1 and (4, 3).



**Find:**

(a) Slope of CD

(b) Equation of AB

(iii) Prove that:

$$(1+\sin\theta)^2 + (1-\sin\theta)^2/2\cos^2\theta = \sec^2\theta + \tan^2\theta$$

(iv) The mean of the following distribution is 50. Find the unknown frequency.

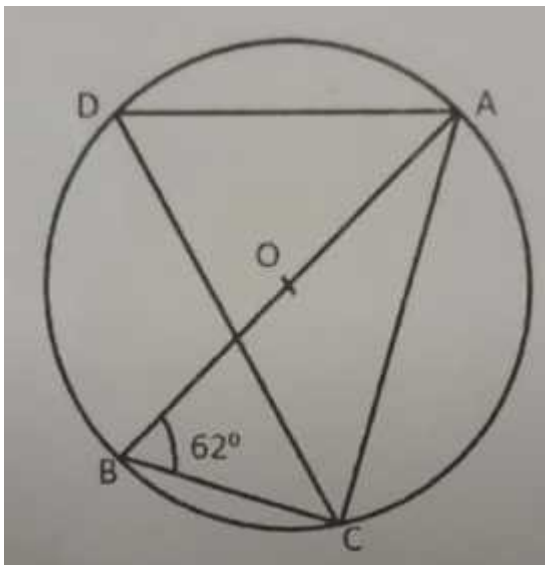
| Class Interval | Frequency |
|----------------|-----------|
| 0 – 20         | 6         |
| 20 – 40        | f         |
| 40 – 60        | 8         |
| 60 – 80        | 12        |
| 80 – 100       | 8         |

**Question 6:**

**(i) Prove that:**

$$1 + \tan^2\theta / 1 + \sec\theta = \sec\theta$$

**(ii) In the given figure A, B, C and D are points on the circle with centre O. Given  $\angle ABC = 62^\circ$**



**Find:**

**(a)  $\angle ADC$**

**(b)  $\angle CAB$**



**(iii) Find the equation a line parallel to the line  $2x + y - 7 = 0$  and passing through the intersection of the lines  $x + y - 4 = 0$  and  $2x - y = 8$ .**

**(iv) Marks obtained by 4 students in an examination are given below.**

| Marks           | 10 – 20 | 20 – 30 | 30 – 40 | 40 – 50 | 50 – 60 | 60 – 70 |
|-----------------|---------|---------|---------|---------|---------|---------|
| No. of students | 3       | 8       | 14      | 9       | 4       | 2       |

Using graph paper draw an ogive and estimate the median marks. Take 2 cm = 10 marks along one axis and 2cm = 5 students along the other axis.