

GOKULDHAM HIGH SCHOOL AND JUNIOR COLLEGE
SECONDARY SECTION 2021-22
ICSE PRE- SEMESTER 2 EXAMINATION
MATHEMATICS

GRADE: X

MAX. MARKS: 40

DATE: 21.02.2022

TIME: 1 hr.30 min.

Answers to this Paper must be written on the paper provided separately.

You will not be allowed to write during first 10 minutes.

This time is to be spent in reading the question paper.

The time given at the head of this Paper is the time allowed for writing the answers.

*Attempt **all** questions from **Section A** and **any three** questions from **Section B**.*

The intended marks for questions or parts of questions are given in brackets

This paper consists of 8 printed pages.

SECTION A

*(Attempt **all** questions from this section)*

Question: 1

Choose the correct answers to the questions from the given options.

[Do not copy the question, Write the correct answer with correct question number and subquestion number only.

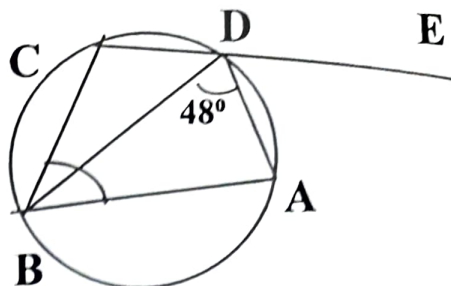
[10]

Example: Q1 (xi) – (c) 90°]

- (i) The point (0, 0) is invariant under reflection in
- (a) x-axis
 - (b) y-axis
 - (c) both x axis and y-axis
 - (d) neither x-axis nor y-axis
- (ii) The curved surface area of a cylinder having height 12cm is 540 cm^2 .
The circumference of its base is
- (a) 20 cm
 - (b) 45cm
 - (c) 35cm
 - (d) 25cm

- (iii) In the given figure, AD is the bisector of $\angle BDE$ and $\angle BDA = 48^\circ$. Then the value of $\angle ABC$ is

- (a) 48°
 (b) 32°
 (c) 96°
 (d) 90°



- (iv) PQ is diameter of a circle. If $P \equiv (-2, 5)$ and $Q \equiv (-4, 9)$, then the co-ordinate of the centre of the circle is

- (a) $(-3, 7)$
 (b) $(3, -2)$
 (c) $(1, -2)$
 (d) $(-1, 7)$

- (v) $\frac{\tan \theta}{\sqrt{1 + \tan^2 \theta}}$ is equal to $\tan = \cot$

- (a) $\cot \theta$
 (b) $\cos \theta$
 (c) $\sin \theta$
 (d) $\tan \theta$

- (vi) Volumes of a cone and a cylinder with same base radius and height are in ratio

- (a) 1:2
 (b) 1:3
 (c) 2:1
 (d) 3:1

- (vii) If lines $3y = 9x - 2$ and $5y = kx - 2$ represent opposite sides of a square, the value of 'k' is

- (a) 12
 (b) 10
 (c) 18
 (d) 15

- (viii) The modal class and the median class for the given distribution are respectively

Class interval	10-20	20-30	30-40	40-50	50-60	60-70
Frequency	5	15	20	15	25	10

- (a) 20-30 and 40-50
(b) 40-50 and 50-60
(c) 50-60 and 40-50
(d) 50-60 and 30-40
- (ix) Which one of the following cannot be the probability of an event?
(a) $\frac{2}{3}$
(b) 15%
(c) $\frac{3}{2}$
(d) 0.0003
- (x) Inter -quartile range =
(a) Nth observation - $(\frac{N}{2})$ th observation
(b) $3(\frac{N}{4})$ th observation - $(\frac{N}{4})$ th observation
(c) $3(\frac{N}{4})$ th observation + $(\frac{N}{4})$ th observation
(d) Nth observation - $(\frac{N}{4})$ th observation
- (xi) Example (Do not copy)
Angle on circumference made by the diameter is
(a) 60°
(b) 120°
(c) 90°
(d) 180°

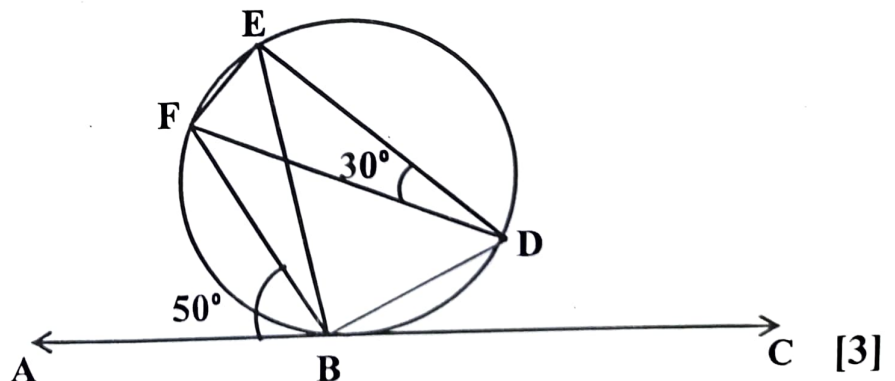
SECTION B

(Attempt any three questions from this section)

Question: 2

- (i) Calculate the ratio in which the line segment joining P (5, 3) and Q (-5, -4) is divided by the line $x = -3$. [2]
- (ii) In a pencil box, there are 36 red pencils and some green pencils. When a pencil is taken out from this pencil box, the probability of getting a green pencil is $\frac{11}{20}$. Find the number of green pencils in the box. [2]
- (iii) A bird is perched on the top of a tree 20m high and its angle of elevation from a point on the ground is 45° . The bird flies off horizontally straight from the observer and in 1 second the angle of elevation of the bird reduces to 35° . Find the speed of the bird to the nearest whole number. [3]
- (iv) In the given figure, AC is a tangent to circle at point B. $\angle FBA = 50^\circ$ and $\angle EDF = 30^\circ$. Find

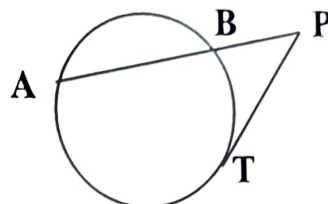
- (a) $\angle FDB$
 (b) $\angle EBF$
 (c) $\angle EFB$



[3]

Question 3

- (i) A solid cone with base diameter 6 cm and height 10 cm is melted and drawn into a wire of radius 1mm. Find the length of the wire (In meter). [2]
- (ii) AP is a secant and PT is a tangent to a circle, as given in the figure. If $PT = 15$ cm and $AB = 8BP$, find AP. [2]



- (iii) Use graph paper for this question.
[Take 2 cm = 4 kg on one axis and 2 cm = 5 units].
Draw a histogram and hence estimate the mode from it.

Mass (kg)	44 - 48	48 - 52	52 - 56	56 - 60	60 - 64
Frequency	13	27	43	36	23

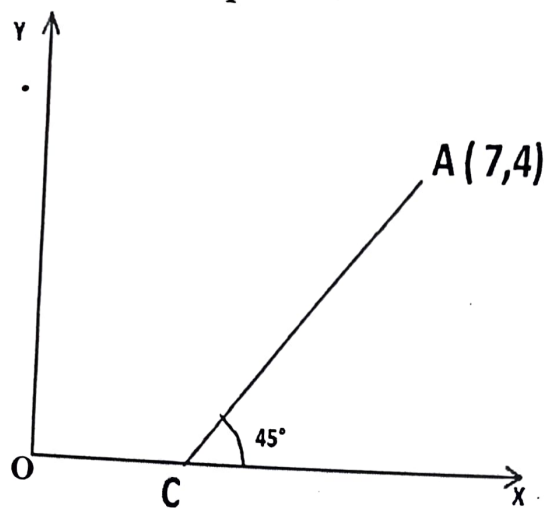
- (iv) Prove: $\frac{\cot\beta}{\underset{\sin}{\text{cosec}\beta+1}} + \frac{\underset{\cos}{\text{cosec}\beta+1}}{\cot\beta} = 2\sec\beta$. [3]

Question 4

- (i) Find the mean percentage (correct to 2 significant figures) of the work completed for a project in a country from the following frequency distribution: [2]

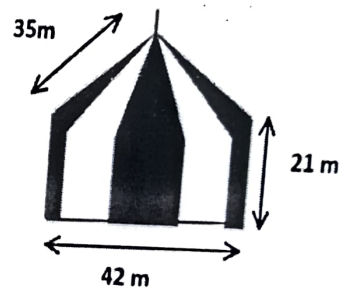
Percentage of work completed	No. of districts
0 - 20	15
20 - 40	45
40 - 60	15
60 - 80	17
80 - 100	8

- (ii) In the given figure $A \equiv (7,4)$ and $\angle ACX = 45^\circ$. Find
- Equation of line AC
 - Co-ordinates of point C



[2]

- (iii) A circus tent is in the shape of a cylinder surmounted by a right cone. The height of the cylindrical part is 21 m and its diameter is 42 m. The slant height of the conical part is 35 m.



Find the total area of canvas required to build the tent.

[3]

- (iv) Use graph paper for this question.

[Take 2cm = 1 units on both the axes].

- Plot the point A $(-4, -3)$ and reflect it in x-axis to point C. Write the co-ordinates of point C. Join AC.
- Plot the point B $(-1, 0)$ and reflect it in line AC to point D. Write the co-ordinates of point D.
- Name the shape of closed figure ABCD.

[3]

Question 5

(i) Prove that

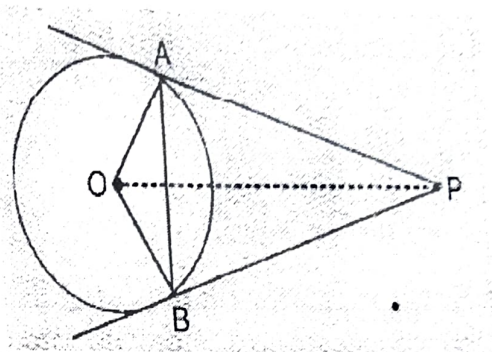
$$\frac{\cos^2 \theta}{\sin \theta} - \operatorname{cosec} \theta + \sin \theta = 0$$

[2]

(ii) In the given figure, PA and PB are tangents to the circle with centre O
 $\angle OPA = 20^\circ$, find

(a) $\angle BAP$

(b) $\angle AOB$



[2]

(iii) The points A (2,3), B (3,5) and C (-1, -1) are the vertices of the triangle ABC. Find the equation of the altitude of the triangle through A.

[3]

(iv) Use graph paper for this question, take 2 cm = 10 kg along one axis and 2 cm = 5 persons along the other axis.

(a) Draw an ogive for the following frequency distribution:

Weight (in kg)	No. of persons
50-60	3
60-70	5
70-80	9
80-90	12
90-100	5
100-110	4
110-120	2

(b) Estimate the median weight from the ogive.

[3]

Question 6

- (i) A child has a die whose six faces show the letters as given



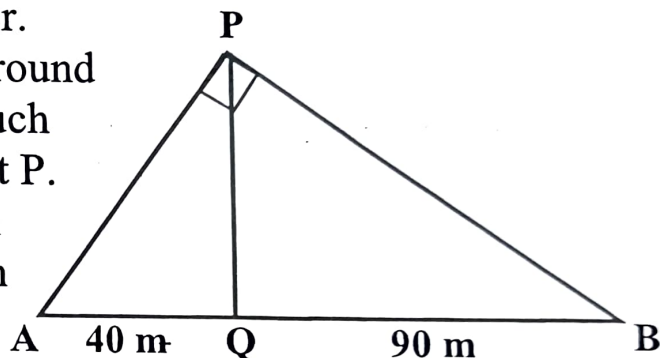
[2]

The die is thrown once. What is the probability of getting?

- (a) An 'I'
 (b) A letter not in word 'ring'
- (ii) Two vertices of a triangle are (1,2) and (3,5) and its centroid is at the origin. Find the co-ordinates of the third vertex.

[2]

- (iii) In the given figure, PQ is a tower.
 A and B are two points on the ground
 on the either side of the tower such
 that AB subtends a right angle at P.
 If the distances of A and B from
 the base Q of the tower are 40 m
 and 90 m respectively,
 find the height of the tower.



[3]

- (iv) Find the unknown frequency 'a' in the following distribution if its mean is 10.8.

Class -interval	Frequency
0-4	3
4-8	2
8-12	a
12-16	8
16-20	2

[3]