



Subject: Mathematics

(One and a half hours)

Practice Paper -1 (2021-22)

GRADE: X

Max. Marks: 40

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

*You will **not** be allowed to write during the 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 **6 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 only.)

[10]

i) Point P (a, b) is reflected in the x-axis to P' (4, -3). The values of a and b are

a) $a = 4, b = 3$

b) $a = -4, b = -3$

c) $a = 4, b = -3$

d) $a = -4, b = 3$

ii) Which of the following cannot be determined graphically?

a) Mean

b) Median

c) Mode

d) None of these

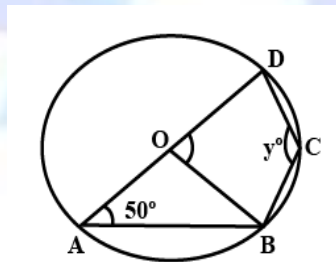
iii) $\frac{\sin \theta}{1+\cos \theta}$ is equal to

- a) $\frac{1+\cos \theta}{\sin \theta}$
- b) $\frac{1-\cos \theta}{\cos \theta}$
- c) $\frac{1-\cos \theta}{\sin \theta}$
- d) $\frac{1-\sin \theta}{\cos \theta}$

iv) The area of the curved surface of a cone of radius $2r$ and slant height $\frac{l}{2}$, is

- a) $\pi r l$
- b) $2\pi r l$
- c) $\frac{1}{2}\pi r l$
- d) $\pi(r+l)r$

v) In the given figure, O is the centre of the circle and $\angle DAB = 50^\circ$. Value of y is

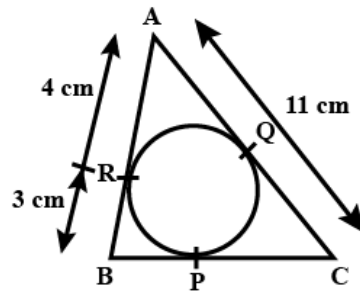


- a) 120°
- b) 130°
- c) 150°
- d) 110°

vi) If $P(E) = 0.05$, then $P(\text{not } E) =$

- a) -0.05
- b) 0.5
- c) 0.9
- d) 0.95

- vii) In the given figure, $\triangle ABC$ is circumscribing a circle. Find the length of BC



- a) 11 cm
b) 12 cm
c) 8 cm
d) 10 cm
- viii) Find the equation of a line parallel to x – axis passing through (-3, 4).
- a) $y + 3 = 0$
b) $x + 4 = 0$
c) $y - 4 = 0$
d) $x - 3 = 0$
- ix) If the angle of elevation of a tower from a distance of 100 metres from its foot is 60° , then the height of the tower is:
- a) $\frac{100}{\sqrt{3}}$ m
b) $100\sqrt{3}$ m
c) $50\sqrt{3}$ m
d) $\frac{200}{\sqrt{3}}$ m
- x) If the point C(-1, 2) divides internally the line segment joining A(2,5) and B in the ratio 3: 4, the coordinates of B are
- a) (-5, -2)
b) (5, 2)
c) (-5, 2)
d) (5, -2)

SECTION B

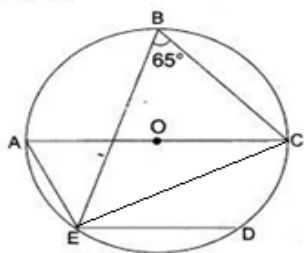
(Attempt **any three** questions from this section)

Question 2

- i) Find the equation of a line with x – intercept -3 and passing through the point (-2, 5) [2]
- ii) Prove: $\cos^2 \theta(1 + \tan^2 \theta) = 1$ [2]
- iii) Use a graph paper to answer the following questions. [3]
- Plot P(3, 1) and Q(0, 5). Reflect Q in the origin to get Q'.
 - Reflect P in y-axis to get R.
 - Reflect P and R in x -axis to get P' and R'.
 - Give a name to figure PQRR'Q'P'.
- iv) When two dice are rolled, find the probability that on the uppermost faces [3]
- the sum of two numbers is less than 5
 - the product of the numbers is 6
 - the sum is divisible by 5.

Question 3

- i) Two vertices of a triangle are (1, 2), (3, 5) and its centroid is at the origin. Find the coordinates of the third vertex. [2]
- ii) From the top of 38m high tower, the angle of depression of the top of a building is 30° . If the height of the building is 18m, find the distance between the tower and the building. [2]
- iii) In the given figure, chord ED is parallel to the diameter AC of the circle. Given $\angle CBE = 65^\circ$, calculate $\angle DEC$. [3]



- iv) Calculate the mean of the following frequency distribution. [3]

Class	0-10	10-20	20-30	30-40	40-50	50-60	60-70	70-80
Frequency	12	20	30	38	16	14	12	8

Question 4

- i) If the mean of the following distribution is 7.5, find the value of p . [2]

x	3	5	7	9	11	13
f	6	8	15	p	8	4

- ii) A box contains 90 discs, numbered from 1 to 90. If 1 disc is drawn at random from the box. Find the probability that the number on the card is a [2]

- prime number less than 23
- perfect square.

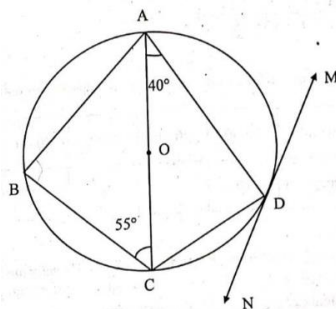
- iii) $A(7, -5)$, $B(5, 3)$ and $C(-9, 1)$ form a triangle. Find the [3]

- equation of altitude through A.
- equation of median through B.

- iv) A cylindrical cistern whose radius is 7 cm is partly filled with water. If a conical block of iron whose radius of base is 3.5 cm and height is 6 cm is wholly immersed in the water, by how much will the water level rise? [Use $\pi = 22/7$] [3]

Question 5

- i) In the given figure, ABCD is a cyclic quadrilateral. AC is a diameter of the circle. MN is the tangent to the circle at D, $\angle CAD = 40^\circ$, $\angle ACB = 55^\circ$. Determine $\angle CDN$ and $\angle BAD$. [2]

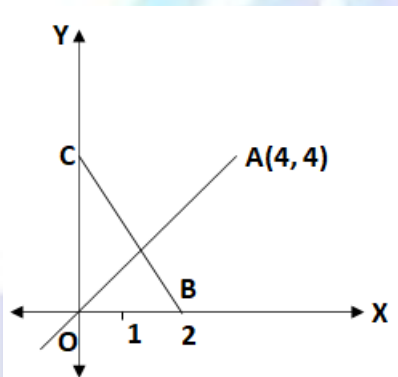


- ii) Two cones have their heights in the ratio 1 : 3 and the radii of their bases in the ratio 3 : 1. Find the ratio of their volumes. [2]
- iii) Prove: $\frac{\cos^2 \theta}{1 - \tan \theta} + \frac{\sin^3 \theta}{\sin \theta - \cos \theta} = 1 + \sin \theta \cos \theta$ [3]
- iv) Draw an ogive for the following data taking 2 cm = 10 marks on one axis and 2 cm = 10 students on the other. From the graph, determine the upper quartile. [3]

Marks	0 - 10	10 - 20	20 - 30	30 - 40	40 - 50	50 - 60	60 - 70
No. of Students	6	10	15	13	20	9	7

Question 6

- i) The median of the observations 11, 12, 14, 18, $x + 2$, $x + 4$, 30, 32, 35, 41 arranged in ascending order is 24. Find the value of x . [2]
- ii) Find the inclination of the line passing through points $A(-1, -\sqrt{3})$ and $B(\sqrt{3}, 3)$. [2]
- iii) From the given figure, find the [3]



- a) equation of OA
 b) equation of $BC \perp$ to OA
 c) coordinates of C.

- iv) A cylindrical jug of radius 8 cm and height 10 cm is filled with orange juice. It is then poured into small conical cups of radius 2 cm and height 6 cm. Find the number of cups that can be filled. [3]