Gujarat Research Society's
Jasudben M L School, Khar
Preliminary Examination (Semester II)
2021-2022

Std.: X
Subject: Mathematics

Date: 21st February,2022
Time: 1 hour and 30 min
Marks: 40

(This Paper has 6 printed sides)

You will not be allowed to write during the first 10 minutes.
This time is to be spent in reading the question paper.
Time given at the head of this Paper is the time allowed for writing the answers.

Attempt ***all*** questions from Section A and ***any 3*** questions from Section B
All working, including rough work, must be clearly shown and must be done on the same sheet as the rest of the answers.
Omission of essential working will result in loss of marks.
The intended marks for questions or parts of questions are given in brackets [ ].

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) The slope of the line joining the points (-3,0) and (4,0) is:

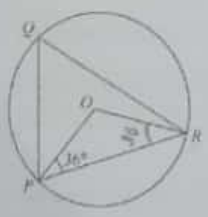
(a) 1

(b) same as x-axis

(c) same as y-axis

(d) -1

(ii) In the given circle with centre 'O'. If $\angle OPR = 36^0$, then the measure of $\angle PQR$:



(a) 36^0

(b) 72^0

(c) 108^0

(d) 54^0

(iii) Curved surface area of the cylinder = _____ X height

(a) Area of the base

(b) Perimeter of the base

(c) Both (a) and (b)

(d) radius of the base

(iv) If the points A and B have coordinates (1,2) and (2, - 4) respectively. Then the co-ordinates of its midpoint is:

(a) (3, -2)

(b) (-1.5, 1)

(c) (1.5, -1)

(d) (-1.5, -1)

(v) $\tan\theta \times 1/\cot^2\theta$ is equal to:

(a) $\cos^3\theta$

(b) $\sin^2\theta$

(c) $\tan^3\theta$

(d) $\cot^3\theta$

(vi) The modal class for the given distribution is:

Classes	0-10	10-20	20-30	30-40	40-50	50-60	60-70
Frequency	5	10	18	30	20	12	5

(a) 20-30

(b) 30-40

(c) 40-50

(d) 50-60

(vii) The image of the point (1,3) under reflection in X axis is:

(a) (1,3)

(b) (-1,-3)

(c) (-1,3)

(d) (1,-3)

(viii) When a solid cuboid made of gold is melted and recast into a solid conical shape then which of the following feature remains same?

(a) total surface area

(b) curved surface area

(c) volume

(d) none of the above

(ix) In the given data, the frequency of the median class is:

Daily wages (in ₹)	100-120	120-140	140-160	160-180	180-200
Number of workers	12	14	8	6	10

(a) 120-140

(b) 14

(c) 140-160

(d) 8

(x) If the probability is given by m/n; then which of the following is never true:

(a) $m/n \leq 1$

(b) $m = n$

(c) $m > n$

(d) $m < n$

SECTION B
(Attempt any three questions from this Section.)

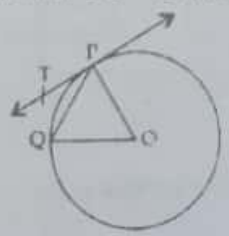
Question 2

(i) Find the coordinates of the centroid of the triangle whose vertices are points A (-6, 4); B (3, 8) and C(2,0) [2]

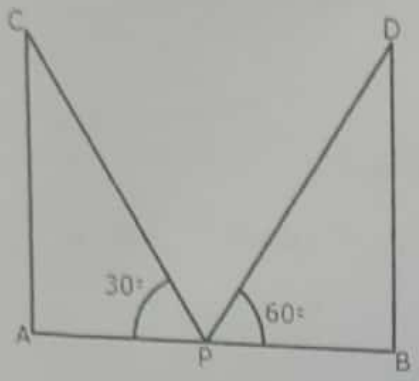
(ii) An unbiased coin is tossed. What is the probability that it is?

a) Both head and tail
b) Neither head nor tail [2]

(iii) In the given figure, O is the centre of a circle, PQ is a chord and PT is the tangent at P. If $\angle POQ = 70°$, then calculate $\angle PQO$ and $\angle TPQ$. [3]

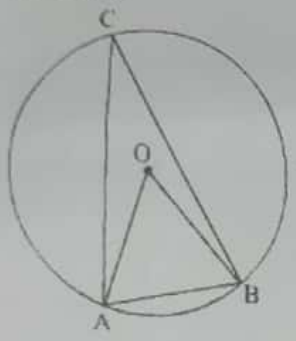


(iv) Two poles of equal heights are standing opposite each other on either side of the road, which is 80 m wide. From a point between them on the road, the angles of elevation of the top of the poles are 60° and 30°, respectively. Find the height of the poles correct to the nearest meter. (use $\sqrt{3}$= 1.732) [3]



Question 3

(i) In the given figure, in a circle with centre O, length of chord AB is equal to the radius of the circle. Find measure of each of the following.
(1) ∠ AOB (2) ∠ ACB [2]



(ii) The volume of solid right cylinder cones is 4928cu.cm. If a height is 24cm, then find the radius of the cone. [2]

(iii) Prove that: [3]

$$\frac{\sin\theta}{1+\cos\theta} + \frac{1+\cos\theta}{\sin\theta} = 2 \operatorname{cosec} \theta$$

(iv) Following table shows the daily wages (in ₹.) of 78 employees in a company. Draw a histogram for the data and find the modal daily wage: [3]

Daily wages	200-300	300-400	400-500	500-600	600-700	700-800
No. of employees	8	14	18	22	12	4

Question 4

(i) Find the equation of the line passing through the point P (-1,0) and is parallel to the line joining A (-1,-3) and B (2,3). [2]

(ii) The median of the following observation 11, 12,14,18, x+4,30,32,35 ,41 arranged in ascending order is 24. Find x. [2]

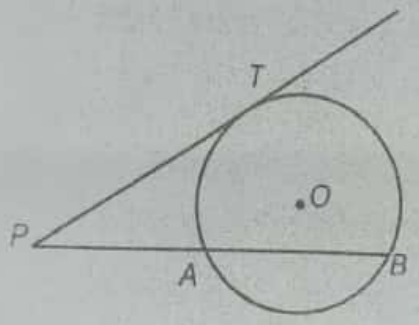
(iii) The sum of the radius of base and height of a solid right circular cylinder is 37 cm. If the total surface area of the solid cylinder is 1628 sq. cm, find the radius of base of the cylinder. (Use $\pi = 22/7$) [3]

(iv) Using graph paper and taking 2cm = 1 unit along both x-axis and y-axis.

a) Plot the points A (3, 2) and B (5, 4).
b) Reflect A and B in the X axis to get the images A' and B' respectively.
c) Plot these points on the same graph paper.
d) Give the geometrical name for the figure ABB'A' [3]

Question 5

(i)In Following Fig., PT is a Tangent to the Circle at T and PAB is a Secant to the Same Circle. If PA = 4cm and AB = 5 cm, Find PT. [2]



(ii) Prove that: $\sec\theta\sqrt{(1 - \sin^2\theta)} = 1$ [2]

(iii) Find the equation of a line passing through the point (– 2, 3) and having x-intercept 4 units. [3]

(iv) Draw an Ogive for the following frequency distribution by less than method and also find its median from the graph. [3]

Marks	0 – 10	10 – 20	20 – 30	30 – 40	40 – 50	50 – 60
Number of Students	7	10	23	51	6	3

Question 6

(i) The probability of selecting a rotten apple randomly from a heap of 900 apples is 0.18. What is the number of rotten apples in the heap? [2]

(ii) The coordinates of A and B are (-3, a) and (1, a+4) respectively. The midpoint of AB is (-1,1). Find the value of a. [2]

(iii) The upper part of a tree broken by wind falls to the ground without being detached. The top of the broken part touches the ground at an angle of 30^0 at a point 8 m from the foot of the tree. Calculate the height at which the tree is broken correct to two decimal places. (Assuming that the tree is perpendicular to the ground) (use $\sqrt{3}$= 1.73) [3]

(iv) The arithmetic mean of the following data is 14. Find the value of k [3]

X	5	10	15	20	25
F	7	k	8	4	5

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