Nayak's Tutorials

Way to Excellence

Year:- 2024 - 25	**Practice Paper – 3**	**Marks :- 80**
Std:-X ICSE	**Mathematics**	**Duration :- 3Hrs.**

General Instructions:

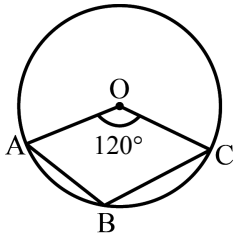
1. Attempt all questions from section A
2. Attempt any 4 compete questions from section B
3. All working, including rough work, must be clearly shown and must be done on the Same sheet as the rest of the answer.
4. Omission of essential working will result in loss of marks.
5. Use graph sheet wherever necessary.

Section – A

Attempt all questions from this section

Q1.Multipe choice Questions:- 15

1. O is the centre of the circle and the measure of arc ABC is 120°, then ∠ABC will be



a) 70° b) 120° c) 125° d)240°

2. If sec A + tan A = m and sec A – tan A – n, the value of mn is:
   a) 0 b) 1 c) sec A d) tan A

3. The median class of the following frequency distribution table is:

Class	Frequency
0–10	9
10–20	3
20–30	12
30–40	4
40–50	12

   a) 10–20 b) 20–30 c) 30–40 d) 40–50

4. If a pair of dice is tossed, the probability of getting the sum of the numbers on the top less than 12 is:
   a) 1 b) 1/36 c) 1/2 d) 35/36

5. The ratio in which the X–axis divides the line joining the points (–3, 6) and (2, –8) is:
   a) 2 :1 b) 3 : 2 c) 2 : 3 d) 3 : 4

6. If the fifth term of an A.P. is 16 and the ninth term is 28, then the 12th term is:
   a) 34 b) 37 c) 35 d) 36

7. How many parallel tangents a circle can have ?
   a) 3 b) 2 c) 1 d) 4

8. What is the probability that a non leap year selected at random will contain 53 Sundays?
   a) $\frac{1}{7}$ b) 7 c) $\frac{1}{6}$ d) $\frac{6}{7}$

9. How many multiples of 4 are there in between 10 and 250?
   a) 70 b) 60 c) 65 d) 73

10. If the point P(k,0) divides the line segment joining the points A(2,−2) and B(−7,4) in the ratio 1:2,then the value of k is:
   a) 1 b) 2 c) −2 d) −1

11. A solid right circular cone is cut into two parts at the middle of its height by a plane parallel to its base . The ratio of the volume of the smaller cone to the whole cone is :
   a) 1:2 b) 1:4 c) 1:6 d) 1:8

12. The tops of two poles of height 24m and 36m are connected by a wire .If the wire makes an angle of 60^0 with the horizontal, then the length of the wire is :
   a) $8\sqrt{3}$ m. b) 8m c) $6\sqrt{3}$ m.d) 16cm

13. If the roots of the quadratic equation $2kx^2 + (2a + b)x - ab = 0$ are (−2,a), the value of k is:
   a) −1 b) −2 c) 1 d)2

14. What is the remainder, if we divide $6x^3 + x^2 - 2x + 4$ by x− 2 ?
   a) 48 b) 52 c) −26 d) −24

15. If 3 times the third time of an AP. is equal to 5 times the fifth term, then its eight term is:
   a) 0 b) 1 c) 2 d) 3

Question 2 **12**

1) A man standing on the bank of a river observes that the angle subtended by a tree on the opposite bank is 60°. When he retires 20 m from the bank, he finds the angle to be 30°. Find the height of the tree and the width of the river [4]

2) A retailer purchased an air conditioner for ₹35,000 from a company consumer at a profit of 5000. calculate the tax liability of the retailer rate on air conditioner is 28%. [4]

3) Ahmed has a Recurring Deposit Account in a bank. He deposits ₹2,500 per month for 2 years. If he gets ₹66,250 at the time of maturity, find [4]
   (*i*) the interest paid by the bank.
   (*ii*) the rate of interest.

Question 3 **13**

1) Prove the following identities: $(\sin A + \operatorname{cosec} A)^2 + (\cos A + \sec A)^2 = \tan^2 A + \cot^2 A + 7$ [4]

2) In each of the following, determine value(s) of k for which the given quadratic equations have equal roots: $(k-1)x^2 - 3x + 1 = 0$ [4]

3) A man observes the angle of elevation of the top of a building to be 30°. He walks towards it in a horizontal line through its base. On covering 60 m, the angle of elevation changes to 60°. Find the height of the building correct to the nearest metre. [5]

Section–B

Attempt any 4 out 7 Questions

Question 4 **[10]**

1) The mean of the following distribution is 52 and the frequency of class interval 30 – 40 is 'f'. Find 'f'. [3]

Class interval	10 – 20	20 – 30	30 – 40	40 – 50	50 – 60	60 – 70	70 – 80
Frequency	5	3	f	7	2	6	13

2) Given A = , $\begin{bmatrix} 2 & 6 \\ 2 & 0 \end{bmatrix}$ B = $\begin{bmatrix} 3 & 2 \\ 4 & 0 \end{bmatrix}$ and C = $\begin{bmatrix} 4 & 0 \\ 0 & 2 \end{bmatrix}$. Find the matrix X such that A + 2X = 2B + C. [3]

3) If $\frac{x^2+y^2}{x^2-y^2} = \frac{17}{8}$, then find the value of: [4]

(*i*) $x : y$ (*ii*) $\frac{x^3+y^3}{x^3-y^3}$

Question 5 **[10]**

1) The sum of the radius of the base and height of a solid cylinder is 37 m. If the total surface area of the solid cylinder is 1628 m², find its volume. $\left(Use\ \pi = \frac{22}{7}\right)$ [3]

2) Which term of the sequence 2, 7, 12, ... is 97? [3]

3) Show that $(x-1)$ is a factor of $x^3 - 7x^2 + 14x - 8$. Hence, completely factorise the above expression. [4]

Question 6 **[10]**

1) The sum of three numbers in G.P. is $\frac{39}{10}$ and their product is 1. Find the numbers. [3]

2) Find the equation of a line with x intercept = 5 and passing through the point (4, –7). [3]

3) Use graph paper for this question. [4]

(i) The point P(2, – 4) is reflected about the line $x = 0$ to get the image Q. Find the coordinates of Q.

(ii) Point Q is reflected about the line $y = 0$ to get the image R. Find the coordinates of R.

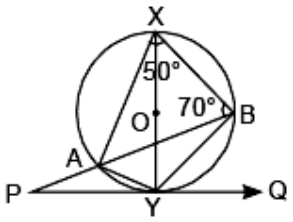
(iii) Name the figure PQR.

(iv) Find the area of figure PQR.

Question 7 **[10]**

1) Prove that $\frac{sin^3A+cos^3A}{\sin A+\cos A} + \frac{sin^3A-cos^3A}{\sin A-\cos A} = 2$ [3]

2) In the given figure, XY is a diameter of the circle and PQ is a tangent to the circle at Y. If $\angle AXB = 50°$ and $\angle ABX = 70°$, calculate $\angle BAY$ and $\angle APY$. [3]



3) Car A travels x km for every litre of petrol, while car B travels $(x + 5)$ km for every litre of petrol. [4]

(i) Write down the number of litres of petrol used by car A and car B in covering a distance of 400 km.

(ii) If car A uses 4 litres of petrol more than car B in covering the 400 km, write down an equation in x and solve it to determine the number of litres of petrol used by car B for the journey.

Question 8 **[10]**

1) ABC is a triangle. PQ is a line segment intersecting AB in P and AC in Q such that PQ | | BC and divides ABC into two parts equal in area. Find $\frac{BP}{AB}$ [3]

2) Sangeeta invests ₹ 16500 partly in 10%, ₹ 100 shares at ₹ 130 and partly in 8%, ₹ 100 shares at ₹120. If her total annual income from these shares be ₹ 1180, find her investment in each kind of shares. [3]

3) A line passes through the points (2, –5) and Q(4, 3) find: [4]

(*i*) the slope of the line

(*ii*) the equation of the line

(*iii*) the value of 'a' if PQ passes through the point $(a - 1, a + 4)$

Question 9 **[10]**

1) Construct a ΔABC with AB = 7cm, BC = 8 cm and $\angle ABC = 60°$. Locate by construction, the point P such that P is equidistant from B and C, and P is equidistant from AB and BC. [5]

2) Marks obtained by 200 students in an examination are given below: [5]

Marks	0 – 10	10 – 20	20 – 30	30 – 40	40 – 50	50 – 60	60 – 70	70 – 80	80 – 90	90 – 100
Number of students	5	11	10	20	28	37	40	29	14	6

Draw an ogive for the given distribution taking 2 cm = 10 marks on one axis and 2 cm = 20 students on the other axis. Using the graph, determine:

(*i*) The median marks.

(*ii*) The number of students who failed, if minimum marks required to pass is 40.

(*iii*) If scoring 85 and more marks is considered as grade one, find the number of students who secured grade one in the examination.

Question 10 **[10]**

1) A conical tent is to accommodate 11 persons. Each person must have 4 square metres of the space on the ground and 20 m^3 of air to breathe. Find the height of the cone. [3]

2) Calculate the mean of the following data (Using short-cut Method). [3]

C.I.	0 – 10	10 – 20	20 – 30	30 – 40	40 – 50
Frequency	6	8	10	2	4

3) Two coins are tossed simultaneously. Find the probability of getting. [4]

(i) 2 heads (ii) 2 tails (iii) at least one head (iv) at most one tail

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