10 th CLASS

MATHEMATICS

PAPER - II   PART – A & B

MODEL PAPER - 2

Time 2.30 Hours   **Max Marks: 50**

Instructions: 1) Answer the questions under Part-A on a separate answer book

2) Write the answer to the Questions under Part-B on the question paper itself & attach it to the answer book of Part-A

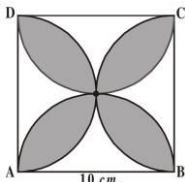| **Time: 2 Hours** | **PART – A** | **Marks: 35** |

SECTION – I   5x2=10

Note: 1) Answer any 5 questions choosing at least 2 from each of the following two groups A & B

2) Each question carries 2 Marks.

GROUP – A

(Similar Triangles, Tangents and Secants to a Circle, Mensuration)

1. Prove that a line joining the midpoint of any two sides of a triangle is parallel to the third side (using converse of basic proportionality theorem)
2. The areas of two similar triangles are 81cm² and 49cm² respectively. If the attitude of the bigger triangle is 4.5cm. find the corresponding attitude of the smaller triangle.
3. Find the area of the shaded region in figure where ABCD is a square of side 10cm and semicircles are drawn with each side of the square as diameter (use π=3.14)
4. A s_____ nd a cone are of the same radius and same height. Find the ratio of their curved surface areas.

GROUP – B

(Trigonometry, Applications of Trigonometry, Probability, Statistics)

5. Evaluate sin60°cos30°+sin30°cos60°. What is the value of sin(60°+30°). What can you conclude.
6. A tower stands vertically on the ground. From a point which is 15meter away from the foot of the tower, the angle of elevation of the top of the tower is 45°. What is the height of the tower?
7. A bag contains a red ball, a blue ball and a yellow ball, all the balls being of the same size. Manasa takes out a ball from the bag without looking into it. What is the probability that she takes a i)tallow ball? Ii)red ball? Iii)blue ball?
8. A survey conducted on 20 households in a locality by a group of students resulted in the following frequency table for the number of family members in a household.

Family size	1-3	3-5	5-7	7-9	9-11
No of families	7	8	2	2	1

Find the mode of this data.

SEXTION –II   4x1 = 4

Note: 1) Answer any four of the following questions.

2) Each question carries 1 Mark.

9.   Write the properties of similar triangles.
10. Find the length of the triangle to circle with centre 'o' and radius 6cm from a point p such that op=10cm.
11. Evaluate: sin45°+cos45°.
12. Write the formula of mean for grouped data.
13. Define complementary event.
14. Find the total surface area of hemisphere of radius 3.5cm.

SECTION - III   4x4=16

Note   1. Answer any 4 questions choosing at least 2 from each of the following two groups A & B

2. Each question carries 4 Marks.

GROUP – A

(Similar Triangles, Tangents and Secants to a Circle, Mensuration)

15. Prove that if a line is drawn parallel to one side of a triangle to intersect the other two sides in distinct points, then the other two sides are divided in the same ratio.
16. ABC is a right triangle right angled at C. Let BC=a, CA=b, AB=c and let p be the length of perpendicular from C on AB. Prove that i) pc = ab ii) $\frac{1}{p^2}=\frac{1}{a^2}+\frac{1}{b^2}$.
17. A chord of a circle of radius 10cm subtends to right angle at the centre. Find the area of the corresponding (use π=3.14)
I)minor segment   ii) major segment
18. The lateral surface area of the cylinder is equal to the curved surface area of a cone. If the radius be the same, find the ratio of the height of the cylinder and slant height of the cone.

GROUP – B

(Trigonometry, Applications of Trigonometry, Probability, Statistics)

19. If A,B and C are in interior angles of triangle ABC, then show that $\sin\frac{B+C}{2} = \cos\frac{A}{2}$.
20. Length of the shadow of a 15meter high people is $5\sqrt{3}$ meters at 7'o clock in the morning then what is the angle of elevation of the sun rays with the ground at the time?
21. One card is drawn from a well shuffled pack of 52 cards. Find the probability of getting
i)a king of red colour   ii)a face card   iii)a red face card
iv)The jack of hearts   v)a spade   vi)the queen of diamonds.
22. The marks distribution of 30 students in a mathematics examination are given in the adjacent table. Find the mode of this data. Also compare and interpret the mode and the mean.

Class interval	No of students	Class marks	f_ix_i
10-25	2	17.5	35.0
25-40	3	32.5	97.0
40-55	7	47.5	332.5
55-70	6	62.5	375.0
70-85	6	77.5	465.0
85-100	6	92.5	555.0
Total	30		Σf_ix_i =1860.0

SECTION – IV   1x5=5

Note: 1) Answer one question from the following.
         2) Each question carries 5 Marks.
              (Similar Triangles, Applications of Trigonometry)

23. Draw a line segment of length 7.2cm and divide it in the ratio 5:3. Measure the two parts.

24. The angle of elevation of a jet plane from a point A on the ground is 60°. After a flight of 15 seconds, the angle of elevation changes to 30°. If the jet plane if flying at a constant height of $1500\sqrt{3}$ meter, find the speed of the jet plane ($\sqrt{3}$=1.732).
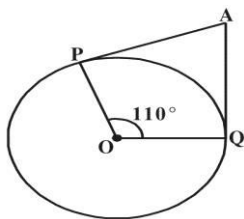
PART - B

Time: 30 Minutes	Model Paper - 2	Marks: 15

I. Write the capital letter showing the correct answer for the following questions in the brackets provided against them. $10 \times \frac{1}{2} = 5$

1.   If AP and AQ are the two tangents a circle with centre 'O' so that ∠POQ = 110⁰, then ∠PAQ =

    A. 60⁰   B. 70⁰   C. 80⁰   D. 90⁰

2. Square of distance between (1,0) (0,tan θ) is   [   ]

    A. $1+\cot^2\theta$ B. $1+\csc^2\theta$ C. $\sec^2\theta$ D. $\cot^2\theta$

3. In the formula d=x_i-a, a means ....   [   ]

    A. deviation   B. Frequency   C. Assumed mean   D. Mid value of class

4. If a dice is thrown, probability that shown even number on its face.   [   ]

    A. ½   B. 2/3   C. ¼   D. 1/3

5. Mean of 5 observations is 12. If one observation is added mean   [   ]

    changed as 13 then the added observation is   ....

    A.14   B. 15   C. 12   D.18

6. Ratio of curved surface areas of sphere, cylinder and cone if these are   [   ]

    having same radius and height.

    A.4:$\sqrt{5}$:4   B. 4:4:$\sqrt{5}$ C.$\sqrt{5}$:4:4   D.4:$\sqrt{5}$:$\sqrt{5}$

7. if cos7A=sin(A-6), then A= ....   [   ]

    A. 40°   B. 34°   C. 12°   D. 8°

8. If a card is taken from a deck, then probability of that card is 'not ace'

    A.12/13   B. 1/13   C.12/52   D.1/52

9. Which of the following is true ....   [   ]

    A. $\sin\theta = \cos\theta\sqrt{\operatorname{cosec}^2\theta - 1}$ B. $\cos\theta = \sin\theta\sqrt{\operatorname{cosec}^2\theta - 1}$

    C. $\cos\theta = \cos\theta\sqrt{\operatorname{cosec}^2\theta - 1}$ D. $\sin\theta = \sin\theta\sqrt{\operatorname{cosec}^2\theta - 1}$

10. If p(E)=0.08 then percentage of probability of 'NOTE' is ....   [   ]

    A. 8%   B. 92%   C.0.92%   D.0.02%

II. Fill in the blanks with suitable answers   **10 x $\frac{1}{2}$ = 5**

11. The shadow of 1.65mts height of a person is 1.8mts at the same time shadow of lamp post is 5.4mts then height of its is ....

12. Sum of the squares of sides of a rhombus is equal to ....

13. No. Of tangents can be drawn to a circle ....

14. Length of minute hand of a clock is 14cm then area swept by the minute hand in 15minute is ....

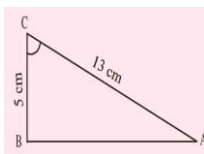15. Height of jokers cap is 3cm, radius is 4cm then its lateral height is ....

16. Volume of cone is 3rd part of the volume of ....

17. If sinA=cosB then $\frac{A+B}{2}$= ....

18. If a letter is selected from alphabet then probability that the letter is vowel ....

19. Formula to find mean in deviation method is ....

20. in the beside diagram value of cos C =

III. For the following questions under Group-A choose the correct answer from the master list Group-B and write the letter of the correct answer in the brackets provided against each item   **10 x $\frac{1}{2}$ = 5**

    A.   GROUP-A   **GROUP – B**

21. If a ladder of 25mts high is placed on a window   [   ]   A. 14cm

    Which is 20mts height from ground then distance between ladder and wall is

22. Areas of ABC and DEF are 64,121cm² and   [   ]   B. 154cm²

    they are similar, if EF=15.4cm then BC=

23. Length of the tangent is 15cm distance   [   ]   C. 154cm

    from centre of circle having 9cm radius is

24. Area of sector made 90° angle at centre   [   ]   D. 15cm

    with 14cm radius

25. Side of cube whose T.S is 1176 sq. cm   [   ]   E. 25cm

    F. 16cm

    G. 11.2cm

    H. 12 cm

       B.   <u>**GROUP-A**</u>   <u>**GROUP – B**</u>

26. Sin (A-B) = $\frac{1}{2}$, Cos(A+B) = $\frac{1}{2}$ then A =   [   ]   I. $\frac{1}{3}$

27. $\tan^2\theta + \tan^4\theta$ =   [   ]   J.   6

28. $\frac{1}{\cos\theta}$ - $\cos\theta$ = …….   [   ]   K. $\cot\theta . \cos\theta$

29. If dice is thrown one time probability that appearing   [   ]   L. 45^0

    above 4 on its face

30. Mode of 5, 6, 9, 10, 6, 12, 3, 6, 11, 10, 4, 6, 7 is….   [   ]   M. $\sec^4\theta - \sec^2\theta$

    N. $\tan\theta$