SUBJECT – MATHEMATICS

10th Class

Max Marks: 40 Marks

Paper - 2

Duration: 2 Hours 45 Minutes

Instructions to Students: Read all the questions thoroughly and write down the answers.

This question paper contains a total of 4 parts. They are

I. There will be 4 questions. Each question carries 4 marks. Answer all the questions.

II. There will be 6 questions. Each question carries 2 marks. Answer all the questions.

III. There will be 7 questions. Each question carries 1 mark. Answer all the questions.

IV. There will be 10 multiple choice questions each question carries ½ mark. Answer all the questions.

I. Answer all the questions. Each question carries 4 marks   **4 x 4 =16**
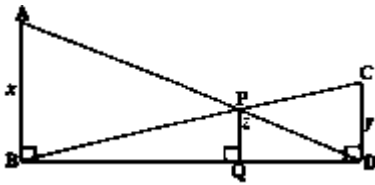
1. AB, CD, PQ are perpendicular to BD. AB = x, CD = y and PQ = Z. Prove that $1/x + 1/y = 1/z$?
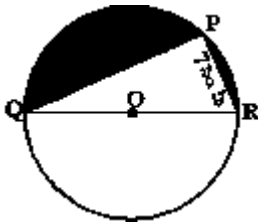
2. Find the area of the segments shaded in figure, if PQ = 24 cm., PR = 7 cm. and QR is the diameter of the circle with center O (Take $\pi = 22/7$)

3. A box contains 3 blue, 2 white, and 4 red marbles. If a marble is drawn at random from the box, what is the probability that it will be
    (a) White
    (b) Blue
    (c) Red

4. A 1.5m tall boy is looking at the top of the temple which is 30m in height from a point at a certain distance. The angle of elevation from his eye to the top of the crown of the temple increases from 300 to 600 as he walks towards the temple. Find the distance he walked towards the temple.?

II. Answer all the questions. Each question carries 2 marks .   **6 x 2 = 12**

5. The radius of a regular circular cylinder is 14 cm. and height 21 cm. What is the area of curvature?

6. Is it justified to say sin (A + B) = sinA + sin B?

7. If a dice is rolled, what is the probability that the number is greater than 4?

8. The details of daily meal expenses incurred by 25 families in a habitat are given in the following table..

| Daily Meal Cost (Rs.)	100-150	150-200	200-250	250-300	300-350
Number of families	4	5	12	2	2

Find out the average meal cost of a single family by choosing the appropriate procedure.

9. The wickets taken by a bowler in 10 cricket matches are as follow: 2,6,4,5,0,2,1,3,2,3 Find the mode of the data.

10. What is the probability of drawing out a red king from a deck of cards?

III. Answer all the questions. Each question carries 1 mark.   7 x 1 = 7

11. Find the value of x according to the rules of triangles
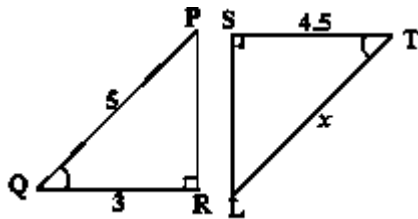
12. A tangent PQ at a point P of circle of radius 5cm meets a line through center O at a point Q so that OQ=12 c.m. Find the length of PQ.

13. Two concentric circles are of radii 5cm and 3cm. length of the chord of the larger circle, (in cm), which touches the smaller circle is?

14. Find the volume of a sphere of radius 2.1 cm

15. Find the total surface area of hemisphere of radius 3.5 cm

16. In $\triangle$ ABC and $\triangle$ XYZ if $\angle$A and $\angle$X are acute angles such that Cos A = Cos X then show that $\angle$A = $\angle$X

17. Find the value of sin 60 ° cos 30 ° + Sin 30 ° cos 60 °

IV. Answer all the questions. Each question carries 1/2 mark.   10 x 1/2 = 5

18. If $\triangle ABC \sim \triangle PQR$ and $\angle P = 50^0$, $\angle B = 60^0$, then $\angle R =$ ( )

    A) 100^0 B) 80^0 C) 70^0 D) None

19. Tangent lines drawn at the end points of the diameter of the circle ( )

    A) Perpendicular   B) Parallel   C) Equal   D) Convergence

20. Two coins are tossed simultaneously. All the possible outcomes are ( )

    (A) H, T   (B) HH, TT   (C) HT, TT   (D) HH, HT, TH, TT

21. In $\triangle ABC \angle B = 90^0$, BC = 5 cm, AC = 13 cm, then Sin C =   ( )

    A) 5/13   B) 15/17   C) 8/15   D) 17/15

22. What is the angle of depression of a boat from a bridge at a horizontal distance of 25m from the bridge if height of bridge is 25m.   (   )

    A) 45^0 B) 60^0 C) 30^0 D) 15^0

23. Volume of hemisphere is..............

    A) $3 \pi r^2$ B) $2 \pi r^2$ C) $2/3 \pi r^2$ D) $4/3 \pi r^2$

24. P (E) + P($\bar{E}$) =   ( )

    A) 0   B) 1   C) 2   D) -1

25. If mean of 4,6,8,10,x,14,16,is 10 then the value of X is   ( )

    A) 11   B) 12   C) 13   D) 9

26. Median of 2,3,8,4,5,7,10 ( )

    A) 5   B) 8   C) 2   D) 10

27. Average of 13 numbers is 8. One of those numbers 20 is eliminated from them. What is the average of the remaining numbers?

    A) 7   B) 5   C) 21   D) 12