

**Maths**

2<sup>nd</sup> Term (Apr-May 2022)

Mega Test – 1

Class 10<sup>th</sup>

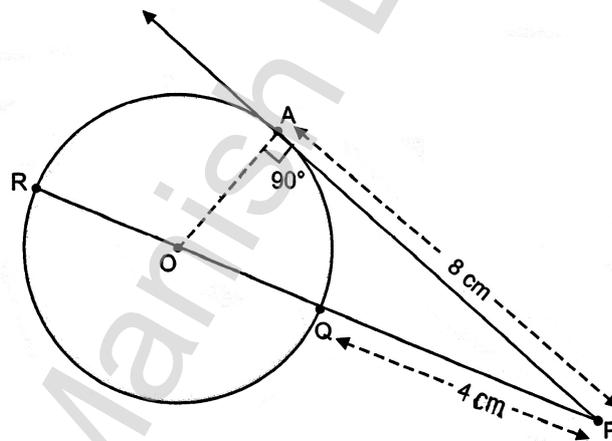
Time allowed: 2 h

Max. Marks: 40

Section	A	B	C
Q. No.	1 – 6	7 – 10	11 – 14
Marks	2	3	4

**Section A**

- If  $a + 1$ ,  $2a + 1$ ,  $4a - 1$  are in A.P., then find the value of  $a$ . Also find the sum of first 10 terms of this AP.
- If one root of the quadratic equation  $2x^2 - 3x + k = 0$  is reciprocal to the other, then what is the value of  $k$ ?
- In figure, O is the centre of the circle and PA is tangent drawn to the circle from the point P. Secant PQR passes through the centre O of the circle. If  $PA = 8$  cm and  $PQ = 4$  cm, find the radius of the circle.



- The radii of two cylinders are in the ratio of 2 : 3 and their heights are in the ratio 5 : 3. Find the ratio of their volumes.
- Find the mode of the following frequency distribution:
 

C.I.	5 – 15	15 – 25	25 – 35	35 – 45	45 – 55	55 – 65	65 – 75
Frequency	2	3	5	7	4	2	2
- The difference of two positive numbers is 3 and the difference of their reciprocals is  $\frac{1}{6}$  (numerical difference). Find the numbers.

### Section B

7. Find the median of the following frequency distribution:

Classes	0 – 10	10 – 20	20 – 30	30 – 40	40 – 50
Frequency (f)	3	6	8	7	2

8. Draw a line segment  $AB = 7$  cm and divide it internally in the ratio  $3 : 2$ .

9. Find  $p$  if the mean of the given data is 15.45.

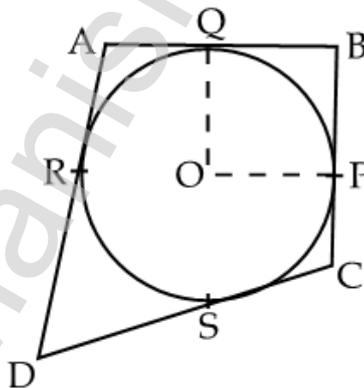
Classes	0 – 6	6 – 12	12 – 18	18 – 24	24 – 30
Frequency	6	8	$p$	9	7

10. From a point on the ground 120 m away from the base of a pole, the elevation of the top of a pole was found to be  $30^\circ$ . Find the vertical height of the pole. (Use  $\sqrt{3} = 1.732$ )

### Section C

11. The internal and external radii of a hollow spherical shell are 3 cm and 5 cm respectively. If it is melted to form a solid cylinder of height  $10\frac{2}{3}$  cm, find the diameter of the cylinder.

12. In the given figure, a circle is inscribed in a quadrilateral  $ABCD$  in which  $\angle B = 90^\circ$ . If  $AD = 23$  cm,  $AB = 29$  cm and  $DS = 5$  cm, find the radius  $r$  of the circle.



13. A 1.2 m tall girl spots a balloon moving with the wind in a horizontal line at a height of 88.2 m from the ground. The angle of elevation of the balloon from the eyes of the girl at any instant is  $60^\circ$ . After some time the angle of elevation reduces to  $30^\circ$ . Find the distance travelled by the balloon during the interval.

14. (i) The sum of first  $n$  terms of an AP is given by  $S_n = 2n^2 + 3n$ . Find the sixteenth term of the AP.

(ii) Find the common difference of an AP whose first term is 10 and the 25<sup>th</sup> term is 20 more than the 20<sup>th</sup> term.

