

Maths

2nd Sem (Apr-May 2022)

Mega Test – 3

Class 10th

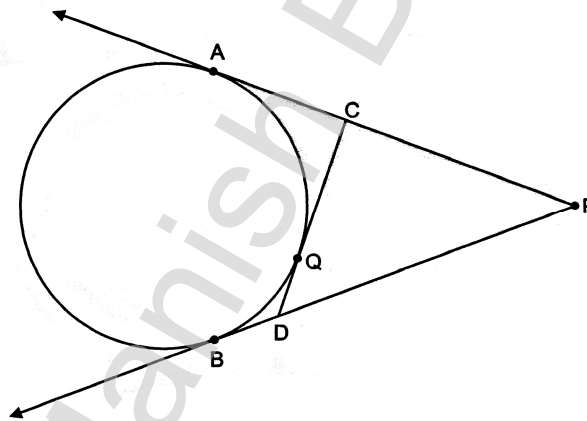
Time allowed: 2 h

Max. Marks: 40

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

Section A

- Find the eleventh term from the last term of the AP: 27, 23, 19,, –65.
- For what value of k the equation $4x^2 - 2(k + 1)x + (k + 1) = 0$ has real and equal roots?
- In figure, PA and PB are the tangents to the circle drawn from an external point P, CD is a third tangent touching the circle at Q. If PB = 7 cm and CQ = 2.5 cm, find the length of CP.



- Find the volume of the largest right circular cone that can be cut out from a cube of edge 4.2 cm.
- Calculate the mode of the following data:

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

- Solve: $9x^2 - 3(a + b)x + ab = 0$.

Section B

- Construct a pair of tangents to a circle of radius 4 cm inclined at an angle of 45° .
- The mean of 10 observations is 15.3. If two observations 6 and 9 are replaced by 8 and 14 respectively, find the new mean.

9. Calculate the median of the following distribution:

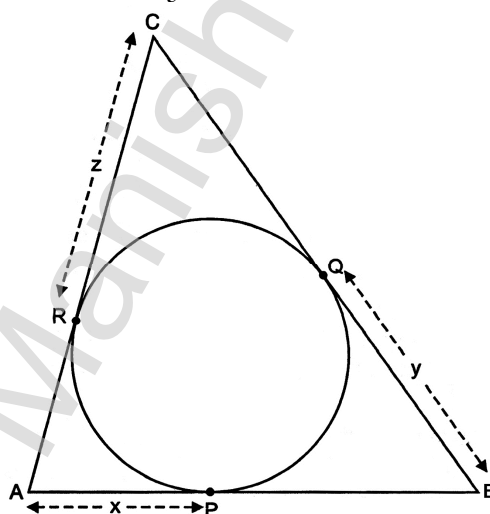
Class	Less than 10	Less than 20	Less than 30	Less than 40	Less than 50
Frequency	7	17	32	48	60

10. A tree stands vertically on the bank of a river. From a point on the other bank directly opposite the tree, the angle of elevation of the top of the tree is 60° . From a point 20 m behind this point on the same bank, the angle of elevation of the top of the tree is 30° . Find the height of the tree and the width of the river. (Take $\sqrt{3} = 1.73$)

Section C

11. An iron pillar has some part in the form of a right circular cylinder and the remaining in the form of a right circular cone. The radius of the base of each of the cone and the cylinder is 8 cm. The cylindrical part is 240 cm high and conical part is 36 cm high. Find the weight of the pillar if 1 cu. cm of iron weighs 7.5 grams.

12. A circle is inscribed in a $\triangle ABC$ having sides $AB = 10$ cm, $BC = 14$ cm and $CA = 12$ cm as shown in figure. The circle touches the sides AB , BC and CA at points P , Q and R respectively. If $AP = x$, $BQ = y$ and $CR = z$, find x , y and z .



13. An aeroplane at an altitude of 200 m observes the angles of depression of two opposite points on two banks of the river to be 45° and 60° . Find, in metres, the width of the river. (Use $\sqrt{3} = 1.732$)

14. In an AP, the sum of first n terms is given by $\frac{5n^2}{2} + \frac{3n}{2}$. Find its 20th term. Also find the common difference of this AP.

