

MOCK SUMMATIVE ASSESSMENT - II(2016-17)

MATHEMATICS

Time allowed : 3 hours

Maximum Marks : 90

General Instructions :

- (i) All questions are **compulsory**.
- (ii) The question paper consists of **31** questions divided into four **sections A, B, C and D**. **Section-A** comprises of **4** questions of **1 mark** each, **Section-B** comprises of **6** questions of **2 marks** each, **Section-C** comprises of **10** questions of **3 marks** each and **Section-D** comprises of **11** questions of **4 marks** each.
- (iii) There is no overall choice.
- (iv) Use of calculator is not permitted.

SECTION-A

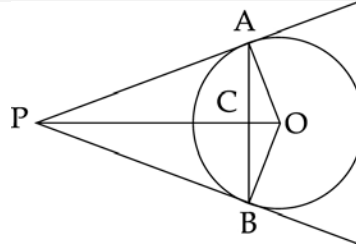
Question numbers **1** to **4** carry **one** mark each.

- | | | |
|---|--|---|
| 1 | If $b=0$, $c < 0$ in the quadratic equation $x^2 + bx + c = 0$, then what will be the nature of the roots ? | 1 |
| 2 | The angle of elevation of the Sun is 60° . What would be the length of the shadow of a 15 m tall tree ? | 1 |
| 3 | A die is thrown once. Find the probability of getting an even composite number. | 1 |
| 4 | Find the ratio in which the line joining $(3, 4)$ and $(-2, 1)$ is divided by the Y-axis. | 1 |

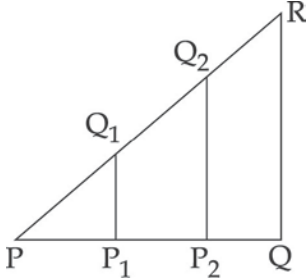
SECTION-B

Question numbers **5** to **10** carry **two** marks each.

- | | | |
|---|---|---|
| 5 | Find k if 3 is a solution of $3x^2 + (k - 3)x + 9 = 0$. | 2 |
| 6 | The 17 th term of an A.P. exceeds the 10 th term by 7. Find the common difference. | 2 |
| 7 | From an external point P, two tangents PA and PB are drawn to a circle with centre O as shown in the figure. Prove that OP is the perpendicular bisector of chord AB. | 2 |

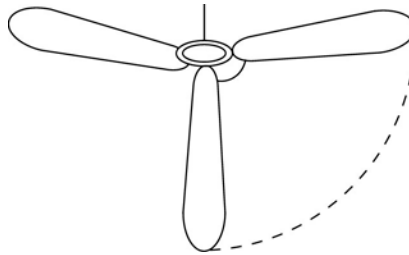


- 8 In the given figure, $PQ_1 = Q_1Q_2 = Q_2R$
 IF $P_1Q_1 \parallel P_2Q_2 \parallel QR$, then find the ratio in which P_1 and P_2 will divide the line segment PQ .



- 9 Draw a circle of radius 4 cm with centre O. Draw a diameter POQ. Through P Construct a tangent to the circle.

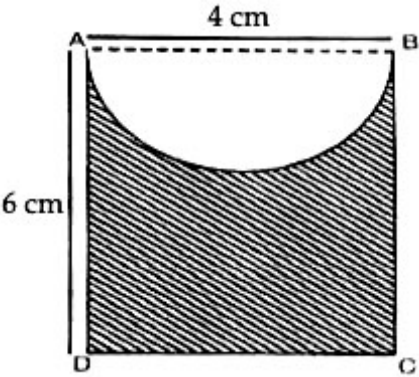
- 10 A ceiling fan has three wings as shown in the figure. Find the length of arc described between two consecutive wings, where length of each wing is 0.98 m. (Use $\pi = \frac{22}{7}$)

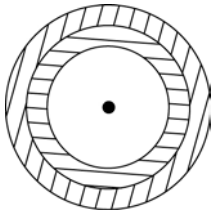


SECTION-C

Question numbers 11 to 20 carry 3 marks each.

- 11 Using quadratic formula solve the following quadratic equation in x :
 $p^2x^2 + (p^2 - q^2)x - q^2 = 0$ 3
- 12 The fifth term of an AP is 13 and its 9th term is 21. Find the AP and sum of first 10 terms. 3
- 13 ABC is a triangle. A circle touches sides AB and AC produced and side BC at X, Y and Z respectively. Show that $AX = \frac{1}{2}$ Perimeter of ΔABC . 3

14	From a point on a bridge across a river, the angles of depression of the banks on opposite sides of the river are 30° and 45° respectively. If the bridge is at a height of 2.5 m from the river, find the width of the river.	3
15	All kings are removed from a deck of 52 playing cards and then remaining cards are well shuffled. One card is selected from the remaining cards. Find the probability of getting : (a) a spade (b) a queen (c) a black card	3
16	Find the value of x such that $AB=BC$, where A, B and C are the points $(6, -1)$, $(1, 3)$ and $(x, 8)$ respectively.	3
17	The vertices of a triangle are $A(3, \sqrt{3})$, $B(3, -\sqrt{3})$ and $C(0, 0)$. Find its perimeter.	3
18	Find the area of the shaded region in the given figure 	3
19	The radius of wire is decreased to one - third. If volume remains the same, then the original length will become what fraction of the new length.	3
20	The side of a solid metallic cube is 60 cm. The cube is melted and recast into 8000 equal solid cubical dice. Find the side of each die.	3
SECTION-D		
Question numbers 21 to 31 carry 4 marks each.		
21	A plane left 40 minutes late due to bad weather and in order to reach its destination 1600 km away in times, it had to increase its speed by 400 km/h from its usual speed. Find the usual speed of the plane.	4
22	The sum of first 6 terms of an AP is 42. The ratio of its 10^{th} term to its 30^{th} term is 1 : 3. Find the first term and the thirteenth term of the AP.	4

23	If the numbers a, b, c, d and e are in an A.P. then prove that $a - 4b + 6c - 4d + e = 0$	4
24	Two circles with centres O and O' of radii 3 cm and 4 cm, respectively intersect at two points P and Q such that OP and $O'P$ are tangents to the two circles. Find the length of the common chord PQ .	4
25	Draw a line segment PQ of length 9 cm. Taking P as centre, draw a circle of radius 5 cm and taking Q as centre, draw another circle of radius 3 cm. Construct tangents to each circle from the centre of the other circle.	4
26	A person standing on the bank of a river observes that the angle of elevation of the top of a tree on the opposite bank is 60° . When he retires 40 metres from the bank, he finds the angle of elevation to be 30° . Find the width of the river.	4
27	A bag contains 20 oranges, 10 apples and 40 mangoes. One fruit is taken out at random from the bag. Find the probability that the drawn fruit is (A) an apple. (B) an apple or orange. (C) a mango. (D) not an orange.	4
28	The vertices of a square $ABCD$ are $A(5, 4), B(-2, 1), C(1, -6)$ and $D(8, -3)$. Verify that the area of an equilateral triangle described on one of its sides is equal to half the area of the equilateral triangle described on one of its diagonals.	4
29	A boy is cycling with a banner "SAY NO TO CRACKERS" such that the wheels of the cycle are making 140 revolutions per minute. If the diameter of the wheel is 60 cm, calculate the speed per hour with which the boy is cycling. What value is depicted by the boy ?	4
30	An archery target has three regions formed by three concentric circles as shown in the figure. If the diameters of the concentric circles are in the ratio 1 : 2 : 3, then find the ratio of the areas and perimeter of three regions.	4
		
31	Water flows through a cylindrical pipe, whose inner diameter is 7 cm, at the rate of 6 km/h in an empty cylindrical tank, the radius of whose basis is 40 cm and height is 4.9 m. How long will it take to fill the whole tank ?	4