SUMMATIVE ASSESSMENT – II, 2016-17
MATHEMATICS
Class – X

Time Allowed: 3 hours   **Maximum Marks: 90**

General Instructions:

1. All questions are **compulsory**.
2. 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.
3. There is no overall choice in this question paper.
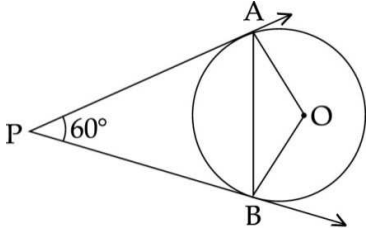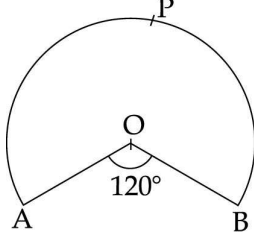4. Use of calculator is not permitted.

SECTION-A

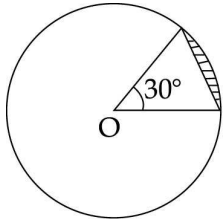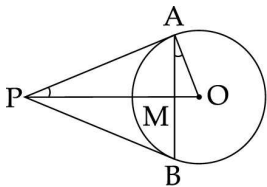Question numbers **1** to **4** carry one mark each

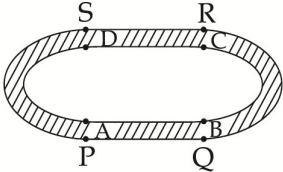|		
1	Find the discriminant of the quadratic equation $3\sqrt{3}x^2 + 10x + \sqrt{3} = 0$.	1
2	If the shadow of a vertical pole at a particular time of the day is equal to $\sqrt{3}$ times its height, then what is the elevation of the source of light at that time ?	1
3	A die is thrown once. Find the probability of getting an even prime number.	1
4	The centre of a circle is C $(3, -4)$ and one end of a diameter AB is A $(-4, -2)$. Find the co-ordinates of the other end B.	1
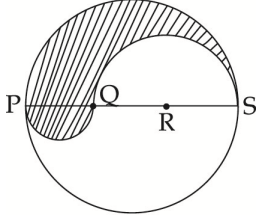
SECTION-B

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

5	Write first four terms of the AP, when the first term is 1.25 and common difference is -0.25.	2
6	If one root of the quadratic equation $2x^2 + kx - 6 = 0$ is 2, then find the value of $k + 1$.	2
7	AB is diameter of a circle with centre O. If PA is a tangent from an external point P to the circle with $\angle POB = 115°$. Find $\angle OPA$.	2
8	Draw a line segment AB of length 9.8 cm and divide it internally in the ratio 3 : 4. Measure the two parts.	2

9	In the given figure, PA and PB are tangents to a circle with centre O such that PA = 9 cm and ∠APB = 60°. Find the length of the chord AB.	2
10	In the given figure, OAPB is a sector of a circle of radius 3.5 cm with the centre at O. If ∠AOB = 120°, then find the length of OAPBO. (Use $\pi = \dfrac{22}{7}$) 	2

SECTION-C

Question numbers **11** to **20** carry three marks each.

11	The first and last terms of an AP are 17 and 350 respectively. If the common difference is 9, how many terms are there and what is their sum ?	3
12	Solve for x : $8x^2 - 8\sqrt{2}\,x + 4 = 0$.	3
13	The angle between two radii of a circle is 70°. Find the angle formed between the pair of tangent which are drawn at the end points of these two radii.	3
14	The angle of elevation of top of an electric pole from a point on the ground, which is 40 m away from the foot of the pole, is 30°. Find the height of the electric pole.	3
15	Two coins are tossed simultaneously. Find the probability of getting : (i) (A) Atleast one head (B) Atmost two tails	3
16	Name the type of triangle formed by the points A(0, 0), B(6, 6) and C(−6, 6).	3
17	A(1, −4), B(3, 2) and C(−1, 2) are the vertices of △ABC and D is the mid-point of BC. If P is a point on AD such that $\dfrac{AP}{PD} = \dfrac{2}{1}$, then, find the coordinates of P.	3

18	Find the number of coins 1.5 cm in diameter and 0.2 cm thick to be melted to form a right circular cylinder whose height is 10 cm and diameter is 4.5 cm.	3
19	If a chord of a circle of radius 10 cm subtend an angle of 30° at the centre of the circle, find the area of the corresponding segment of the circle (See figure). (Take $\pi = 3.14$) 	3
20	A hemispherical depression of largest possible diameter is cut out from one face of a cubical wooden box of edge l. Determine the volume of the remaining solid.	3

SECTION-D

Question numbers **21** to **31** carry four marks each.

21	Find the sum of first 25 terms of an AP, in which the third term is 7 and seventh term is two more than thrice of its third term.	4
22	One day I asked the son of my close friend about his age. He said, "One year ago, my dad was 8 times as old as me and now his age is equal to the square of my age". Find the age of the son.	4
23	An AP has 21 terms. The sum of 10th, 11th and 12th terms is 129 and the sum of the last three terms is 237. Find the AP.	4
24	 Tangents PA and PB are drawn to a circle with centre O from a point P outside the circle. Prove that $\angle OPA = \angle OAM$.	4
25	Construct a ΔPQR in which $QR = 6$ cm, $\angle Q = 60°$ and $\angle R = 45°$. Construct another triangle similar to ΔPQR such that its sides are $\dfrac{5}{6}$ of the corresponding sides of ΔPQR.	4

26	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 is flying at a constant height of $1500\sqrt{3}$ m, find the speed of the jet plane.	4
27	One card is drawn at random from a well-shuffled deck of 52 cards. Find the probability of getting (A) a king of red colour. (B) a face card. (C) a red face card. (D) the jack of hearts	4
28	The vertices of a ΔABC are A(3, 0), B(-1, -6) and C(4, -1). Verify that for this triangle a median of a triangle divides it into two triangles equal in area.	4
29	An athletic track 21m wide consists of two straight sections 150 m long joining semi-circular ends whose diameters are 84 m each (see figure). Find the area of the track. (Use $\pi = \dfrac{22}{7}$ and $\sqrt{3} = 1.73$)	4

30	A shopkeeper sells curd in cylindrical cups of radius 3 cm and height 6 cm. He has kept curd in a hemispherical bowl of radius 18 cm which is full. How many cylindrical cups are required to sell the entire curd ?	4
31	A school has decided to give scholar's badges to its scholar students and they were designed as shown in the figure. PQRS is a diameter of a circle of radius 6cm and the lengths PQ, PR and RS are equal. Find the perimeter of the shaded portion and the area of non–shaded portion. What is the importance of a Scholar's badge for a students ?	4

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