# 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. If $x = 1$ is a common root of quadratic equations $ax^2 + ax + 3 = 0$ and $x^2 + x + b = 0$, then find ab.   1
2. Find the angle of elevation of the top of a 15 m high tower at a point 15 m away from the base of the tower.   1
3. Find the probability of getting at least 3 when a die is thrown once.   1
4. The mid-point of the line segment joining $(2a, 4)$ and $(-2, 2b)$ is $(1, 2a+1)$. Find the value of a.   1

## SECTION-B

Question numbers 5 to 10 carry two marks each.

5. The angles of a quadrilateral are in AP, whose common difference is $10°$. Find the angles.   2
6. Find 'k' so that the quadratic equation $(k + 1) x^2 - 2 (k + 1) x + 1 = 0$ has equal roots.   2
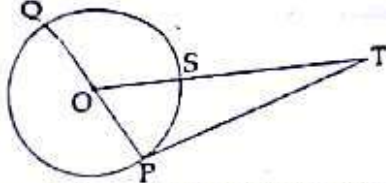


7. In the figure, PQ is a diameter and PT, a tangent of the circle with centre O. If $\angle QOS = 150°$, find $\angle PTS$.
8. Draw a line segment of length 7.8 cm and divide it in the ratio 5 : 8. Measure the two parts.   2
9. Two concentric circles are such that a chord of the larger circle touches the smaller circle of radius 5 cm. If the chord is of length 24 cm, find the radius of the longer circle.   2
10. A pendulum is swinging through an angle of $30°$ and describing an arc of length 8.8 cm. Find the length of the pendulum. (Use $\pi = \frac{22}{7}$)   2
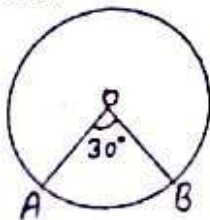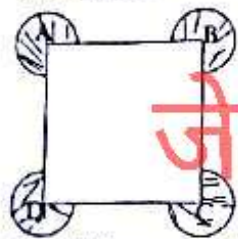


## SECTION-C

Question numbers 11 to 20 carry three marks each.

11. If sum of first 6 terms of an AP is 36 and that of the first 16 terms is 256, find the sum of first 10 terms.   3
12. Find the roots of equation $\frac{1}{x+1} + \frac{2}{x+2} = \frac{4}{x+4}$, $x \neq -1, -2, -4$ by using the quadratic formula.   3
13. Draw a circle of radius 4 cm. Draw two tangents to it inclined at an angle of $45°$ to each other.   3
14. A ladder is leaning against a wall of a house such that its upper end is touching the top of the wall.   3

The foot of the ladder is 2 m away from the wall and the ladder is making an angle of 60° with the level of the ground. Find the height of the wall. Also, find the length of the ladder

15  A child has a block in the shape of a cube with one letter/ number written on each face as shown below :

| 1 | A | A | B | C | D |
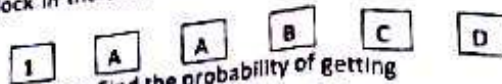
The cube is thrown once. Find the probability of getting

(A)    B or C                     (B)    a number

(C)    a vowel                    (D)    a consonant

16  If A(5, −1), B(−3, −2) and C(−1, 8) are the vertices of triangle ABC, find the length of the median   3
through A on BC.

17  Find the ratio in which the point (6, −3) divides the line segment joining the points (4, −5) and   3
(9, −11).

18  Find the number of plates, 1.5 cm in diameter and 0.2 cm thick that can be fitted completely   3
inside a right circular cylinder of height 10 cm and diameter 4.5 cm.

19  Find the area of the shaded region of the given figure, where ABCD is a square of side 7 cm and sectors   3
of radius 2.1 cm each are drawn at its four vertices. (Use $\pi = \frac{22}{7}$)



20  A medicine capsule is in the form of a cylinder with two hemispherical ends. The radius of   3
the capsule is 3.5 mm and length of the capsule is 12 mm. Find its total surface area. (Use $\pi = \frac{22}{7}$)

## SECTION-D

Question numbers 21 to 31 carry four marks each.

21  Find the sum of first 30 terms of an AP whose $n^{th}$ term is $2 + \frac{1}{2}n$.   4

22  A passenger train takes 2 hours less for a journey of 300 km, if its speed is increased by 5 km/hour   4
from its usual speed. Find its usual speed.

23  In an AP if $a_n = 4$, $d = 2$, $S_n = -14$, find n and a.   4

24  Prove that the lengths of tangents drawn from an external point to the circle are equal.   4

25  Construct a △ABC in which AB= 5 cm, BC=5.5 cm and CA=6 cm. Construct another triangle whose sides   4
are $\frac{5}{3}$ times the corresponding sides of △ABC.

26  A straight highway leads to the foot of a tower. A man standing at the top of the tower observes a car   4
at angle of depression of 30°, which is approaching to the foot of the tower with a uniform speed. Six
seconds later, the angle of depression of the car is found to be 60°. How much more time will be
taken by the car to reach the foot of the tower?

27  25 cards numbered 1, 2, 3, ........., 24, 25 are put in a box and mixed thoroughly. One person   4
draws a card from the box. Find the probability that the number on the card is

(A)    even.                     (B)    a prime.

(C)    divisible by 6.          (D)    divisible by 3 and 7 both.

28  ABCD is a quadrilateral with vertices A(3, 0), B(4, 5), C(−1, 4) and D(−2, −1). Check whether it is a   4
square or a rhombus. Also, find its area.

29  Floor of a room is of dimensions 5 m × 4 m and it is covered with circular tiles of diameters 50   4
cm each as shown in figure. Find the area of floor that remains uncovered with tiles. (Use
$\pi = 3.14$)
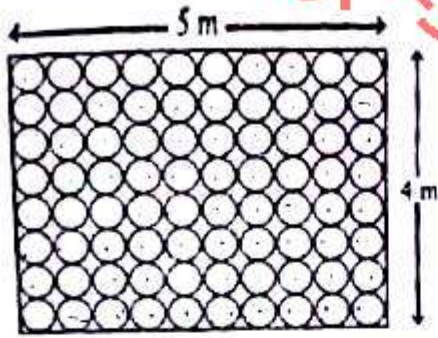
30. A container made of a metal sheet is in the form of a frustum of a cone of height 12 cm with radii of lower and upper ends 3 cm and 12 cm respectively. Find the cost of the metal sheet used, if it costs ₹ 7 per 100 cm², (Use $\pi = \frac{22}{7}$)    (closd container)    **4**

31. Students of a class, when given the task of model making, made the model in the shape of a right circular cylinder with a cone on the one end. The height and radius of the cylindrical part were taken as 13cm and 5cm respectively. The radius of conical and cylindrical parts was same. Calculate the curved surface area of the model, if height of the cone was 12cm. The students used old newspapers to make this model and then painted it in different colours. What values of students are depicted here?    **4**

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