C5C0KZA

2016-17
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 positive root of $\sqrt{3x^2 + 6} = 9$.   1

2. The shadow of a pole at a particular time of the day is $\dfrac{1}{\sqrt{3}}$ times the height of the pole. What is the elevation of the source of light ?   1

3. A pair of dice is thrown once; find the probability of getting an even number on the first die.   1

4. A $(-2, 1)$ and E $(3, 4)$ are the extremities of the median AE of the $\triangle$ABC. Find the-coordinates of its centroid.   1

SECTION-B

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

5. If five times the fifth term of an A.P. is equal to eight times its eighth term, show that its 13th term is zero.   2

6. If $x = \sqrt{3}$ is a solution of a quadratic equation $x^2 + kx - 6 = 0$, then find the value of k.   2

7.   2
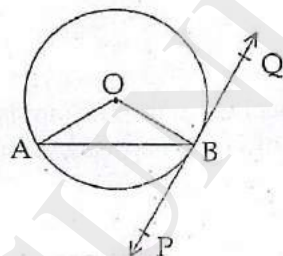
In the figure, PQ is tangent to a circle with centre O. If $\angle OAB = 30°$, find $\angle ABP$ and $\angle AOB$.

8. Draw a line segment PQ = 7 cm and locate a point R on PQ such that $PR = \dfrac{3}{4}$ PQ.   2

9. In the figure, out of the two concentric circles, the radius of the bigger circle is 5 cm and the length of the chord AB of the same circle is 8 cm, which is a tangent to the smaller circle. Find the radius of the smaller circle.   2
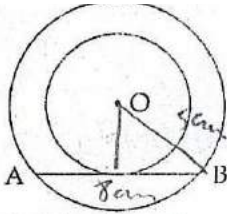
10. A circular piece of cloth is used to cover a circular seat of radius 1 m. Also, 40 cm of cloth all-around the seat is required for stiching purposes. Find the area of the cloth required. (Use $\pi = \dfrac{22}{7}$) **2**

SECTION-C

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

11. Find the sum of the AP : 2, 5, 8, ..., 182. **3**

12. Solve for a : $(a-2) + \dfrac{1}{a-2} = 3$; $a \neq 2$ **3**

13. Construct a pair of tangents to a circle of radius 5 cm, which are inclined to each other at an angle of 50°. **3**

14. The angle of elevation of the top of the first story of a building is 30° at a point on the ground distant 15 metres from its foot. How high its second story will be, if the angle of elevation of the top of the second story at the same point is 45° ? **3**

15. 1050 lottery tickets are sold and there are 15 prizes, on these tickets. If a person has purchased one lottery ticket, what are his chances to win a prize ? **3**

16. Show that the points A(5, − 1), B(8, 3), C(4, 0) and D(1, − 4) are the vertices of a rhombus. **3**

17. Points P, Q and R, in this order, divide a line segment joining A(6, 3) and B(10, 13) in four equal parts. Find the coordinates of P, Q and R. **3**

18. A solid cylinder has a total surface area 462 sq cm. Its curved surface area is one third of the total surface area. Find the volume of the cylinder. **3**

19. In the given figure, find the area of the shaded portion given that AOBCA is a quadrant of a circle with centre O and radius 35 cm and OD = 21 cm. (Use $\pi = \dfrac{22}{7}$) **3**
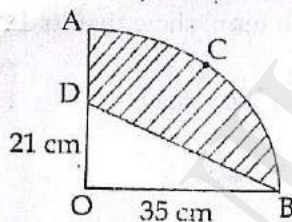
20. A cylindrical bottle with radius 5 cm and height 14 cm has jam packed in it. The jam is spread over bread of measure 11 cm × 10 cm. How thick can the layer of jam be spread, if the entire jam is to cover 10 bread pieces ? **3**

SECTION-D

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

21. If Sn denotes the sum of first n terms of an AP, prove that $S_{12} = 3(S_8 - S_4)$. **4**

22. In a class test, the sum of the marks scored by Prakash in Maths and Science is 28. Had he got 3 more marks in Maths and 4 marks less in Science, the product of the marks obtained in the two subjected would have been 180. Find the marks obtained by Prakash in both the subjects. **4**

23. The sum of the first 8 terms of an AP is 100 and the sum of its first 19 terms is 551. Find the first term and the common difference of the AP. **4**

4

24. PA and PB are the tangents drawn to a circle with centre O. The angle between the chords CA and CB is 70°.

(i) Prove that AOBP is a cyclic quadrilateral.
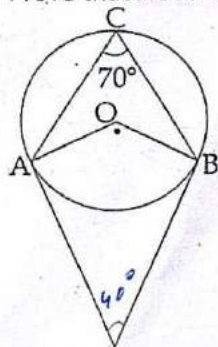
(ii) Find the measure of ∠APB.

25 Construct a ΔPQR in which QR = 6 cm, ∠Q = 60° and ∠R = 45°. Construct another triangle similar to ΔPQR such that its sides are $\frac{5}{6}$ of the corresponding sides of ΔPQR. 4

26 An aircraft is flying along a horizontal line PQ directly towards an observer A on the ground and maintaining an altitude of 4500 m. the angles of depression of A from P and Q are 30° and 60° respectively. Find PQ. 4

27 One card is drawn at random from a well-shuffled deck of 52 cards. Find the probability of getting 4
(A) a king of red colour.   (B) a face card.
(C) a red face card.   (D) the jack of hearts

28 Find the distances between a point on the x-axis and the points A(5, 4) and B(−2, 3) which are equidistant from this point. Also, find the area of the triangle formed by these points. 4

29 A plot is in the form of a rectangle ABCD having a semicircle on BC. If AB = 60 m and BC = 28 m, find the area and perimeter of the plot. 4

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 $\pi = \frac{22}{7}$) 4

31 A manufacturer involves ten children in colouring playing tops (lattus) which are shaped like a cone. The top is 5cm in height and the diameter of the top is 3.5cm. Find the area they had to paint, if 50 playing tops were given to them. What type of social problem is depicted in the question? Also give suggestion for abolishing it. 4