SUMMATIVE ASSESSMENT – II, 2014   [JS-20142]

MATHEMATICS /Class – X

Time allowed : 3 hours   Maximum Marks : 90

SECTION–A

Question Numbers 1 to 8 carry 1 mark each

1. The difference between the circumference and the radius of a circle is 37cm. The area of the circle is

A) 149 cm^2 B) 154 cm^2 C) 12cm^2 D) 169cm^2

2. The area of quadrant of a circle whose circumference is 44cm is

A) 77cm^2 B) 38.5cm^2 C) 19.25cm^2 D) 35.5cm

3. Number of tangents that can be drawn through a point which is outside the circle is

A) 3   B) 2   C) 1   D) 0

4. The radii of two cylinders are in the ratio 2:3 and their heights are in the ratio 5:3. The ratio of their volumes is

A) 3:4   B) 5:3   C) 27:20   D) 20:27

5. When we lower, our head to look at the object, the angle formed by the line of sight with the horizontal is known as

A) obtuse angle   B) angle of elevation   C) angle of depression   D) acute angle

6. If the distance between the points (8,p) and (4,3) is 5 then value of p is

A) 6   B) 0   C) both A and B   D) none of these

7. The number of real roots of the equation $(x-1)^2 + (x-2)^2 + x^2 = 0$ is

A) 2   B) 1   C) 0   D) 3

8. Two APs have the same common difference. The first term of one of these is -1 and that of the other is -8. Then the difference between their 4th terms is

A) -1   B) -8   C) 7   D) -9

SECTION–B

Question Numbers 9 to 14 carry 2 marks each

9. Find the vales of a and b, if the sum and the product of the roots of the equation $4ax^2+4bx+3=0$ are ½ and 3/16 respectively.

10. Find the points on the x-axis which are at a distance of $2\sqrt{5}$ form the point (7,- 4). How many such points are there? $(2,\sqrt{5})$

12. A tower is 50m high. Its shadow is x m shorter, when sun's altitude is 45^0 than when it is 30^0 find x correct to the nearest cm.

13. The sum of first six terms of an AP is 42. The ratio of its 10th term to its 30th term is 1:3. Calculate the first and thirteenth term of the AP

14. Two concentric circles are of radii 5 cm and 3cm. Find out the length of the chord of larger circle which touches the smaller circle.

SECTION–C

### Question Numbers 15 to 24 carry 3 marks each

15. Find the roots of the equation $x^2 - 2 (a^2+ b^2) x + (a^2 - b^2)^2 = 0$

Or,

Divide 29 into two parts so that the sum of the squares of the two parts is 425.

16. Cards marked with numbers 5, 6, 7, ……., 30 are placed in a box and mixed thoroughly and one card is drawn at random from the box. What is the probability that the number on the card is (i) a prime number ? (ii) a multiple of 3 or 5 ? (iii) neither divisible by 5 nor by 10 ?

17. In the fig., PQ and RS are two parallel tangents to a circle with centre O and another tangent XY, with point of contact C intersects PQ at A and RS at B. Prove that AOB = 90^0.
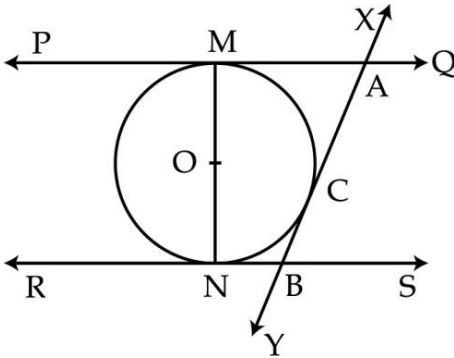
18. Find the sum of all two digit natural numbers which when divided by 3 yield 1 as remainder.

19. Draw a right triangle in which the sides (other than hypotenuse) are of lengths 4cm and 3cm. Then construct another triangle whose sides are $3\frac{1}{4}$ times the corresponding sides of the given triangle.

20. If all the sides of a parallelogram touch a circle, then prove that the parallelogram is a rhombus.

21. In the fig ABC is a quadrant of circle of radius 14cm and a semi-circle is drawn with BC as diameter. Find the area of the shaded region
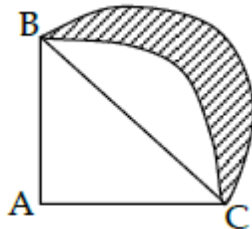
22. A metallic sphere of radius 10.5 cm is melted and then recast into small cones, each of radius 3.5 cm and height 3 cm. Find how many cones are obtained ?

23. The ratio of the radii of two spheres is 1:2. The two spheres are melted together to form a cylinder of height which is 12 times its radius. So what is the ratio of the radius of the smaller sphere and the cylinder?

24. The angles of elevation of the top of a tower from two points at a distance of a and b (a > b) metres away from the base of the tower and in the same straight line with it are 30^0 and 60^0 respectively. Find the height of the tower.

SECTION–D

Question Numbers 25 to 34 carry 3 marks each

25. The base BC of an equilateral triangle ABC lies on *y*-axis. The co-ordinates of the point C are (0, -3). If the origin is the mid-point of the base BC, find the co-ordinates of the points A and B and hence find the area of the △ ABC.

26. One card is drawn at random from a well shuffled deck of 52 cards. Find the probability of getting : (i) a king of red colour (ii) a face card (iii) a red face card (iv) the jack of hearts (v) a spade (vi) a queen of diamonds

27. There are three consecutive positive integers such that the sum of the square of the first and the product of the other two is 154. Find the integers.

28. Farmer connects a pipe of internal diameter 20 cm from a canal into a cylindrical tank in his field which is 10 m in diameter and 2 m deep. If water flows through the pipe at the rate of 3 km/hr, in how much time will the tank be filled ?

29. The angle of elevation of an aeroplane from a point on the ground is 60^0. After 15 seconds flight, the elevation changes to 30^0. If the aeroplane is flying at height of $1500\sqrt{3}$ m , find the speed of the plane.

30. A gulab jamun when completely ready for eating contains sugar syrup up to about 30% of its volume. Find how much syrup would be found in 45 gulab jamuns shaped like a cylinder with two hemispherical ends, if the total length of each gulab jamun is 5 cm and its diameter is 2.8 cm.

31. The radius of the in-circle of a triangle is 4 cm and the segments into which one side is divided by the point of contact are 6 cm and 8 cm. Determine the other two sides of the triangle.
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32. A hemispherical bowl of internal radius 15 cm contains some liquid. This liquid is to be filled in cylindrical shaped bottles of diameter 5 cm and height 6 cm. Find the number of bottles needed to empty the bowl ?

33. In a flight of 600 km, an aircraft was slowed down due to bad weather. The average speed for the trip was decreased by 200 km/hr. and the time of flight increased by 30 minutes. Find the duration of flight.

34. 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.