

MOUNT CARMEL SCHOOL
SUMMATIVE ASSESSMENT - II (March 2017)
MATHEMATICS Class -X

Time allowed : 3 hours

Maximum Marks : 90

General Instructions:

All questions are compulsory.

1. 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.
2. There is no overall choice in this question paper.
3. Use of calculator is not permitted.

SECTION-A

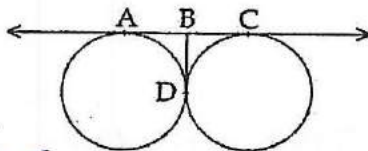
Question numbers 1 to 4 carry one mark each

1. Find the discriminant of the quadratic equation $3\sqrt{3}x^2 + 10x + \sqrt{3} = 0$.
2. A ladder of length $15\sqrt{2}$ m reaches a window 15 m high. Find the inclination of the ladder with the ground.
3. A die is thrown once. Find the probability of getting an odd prime number which is less than 3.
4. Find the distance of the point $(-3, 4)$ from the origin.

SECTION-B

Question numbers 5 to 10 carry two marks each.

5. If the angle between two radii of a circle is 130° , then find the angle between the tangents at the ends of radii.
6. The sixth term of an AP is 17 and the tenth term is 33. Determine the first term and the common difference.
7. Find the value of k such that $\frac{5}{2}$ is a root of the quadratic equation $14x^2 - 27x + k = 0$.
8. Draw a line segment $AB = 7.5$ cm. Find point P such that $AP : PB = 3 : 2$.
9. In the figure, if $AB = 4.5$ cm, find the measure of AC.



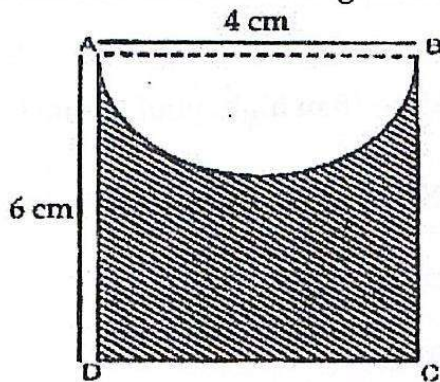
10. A path of width 5 m is built around the circular park of radius 15 m. Find the area of the path.

SECTION-C

Question numbers 11 to 20 carry three marks each.

11. Find the sum of all natural numbers between 1000 and 10000.
12. Draw a circle of radius 5 cm. Construct a pair of tangents to it so that they are inclined at 60° . Measure the lengths of the two tangents.

13. From a point on the ground, the angles of elevation of the bottom and top of a transmission tower fixed at the top of a 20 m high building are 45° and 60° respectively. Find the height of the tower.
14. Rajan had a bag with 30 marbles: 12 blue, 7 red, 5 white and the rest were gray.
- He took a marble. What is the probability that it is a blue marble?
 - If he puts the marble back and takes another one, what is the probability of taking a red one?
 - Rajan took a grey marble and didn't put it back. What is the probability of taking another grey marble immediately after that?
15. A hollow cylindrical pipe is made up of copper. It is 21 dm long. The outer and inner diameters of the pipe are 10 cm and 6 cm respectively. Find the volume of copper used in making the pipe.
16. Find the area of the shaded region in the given figure



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17. Solve : $x^2 - 3x - 9 = 0$
18. The centre of a circle is $(3x - 8, 2x - 5)$. If the circle passes through the point $A(4, 3)$ and the length of its diameter is $4\sqrt{13}$ units, find the value of x .
19. Find the ratio in which the point $(a, 7)$ divides the line segment AB , given $A(-5, 6)$ and $B(4, 10)$. Also, find the value of a .
20. A vessel is in the form of a hemispherical bowl mounted by a hollow cylinder. The diameter of the sphere is 14 cm and the total height of the vessel is 13 cm. Find its capacity. (Use $\pi = \frac{22}{7}$)

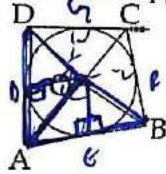
SECTION-D

Question numbers 21 to 31 carry four marks each.

21. Find the value of x if 12th term of the A.P. : $x - 7, x - 2, x + 3, \dots$ is 81. Find S_{12} also.
22. 250 Apples were divided equally among a certain number of students. If there were 25 more students, each would have received half apple less. Find the number of students.
23. The ratio of the 5th and 3rd terms of an AP is 2.5. Find the ratio of the 15th and 7th terms.

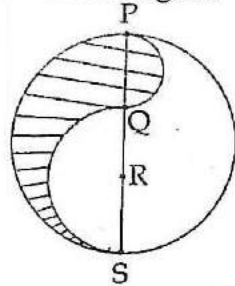
24. A quadrilateral ABCD circumscribes a circle with centre O (as shown in the figure). Prove that:

- (i) OA, OB, OC and OD are the angle bisectors of $\angle A$, $\angle B$, $\angle C$ and $\angle D$ respectively.
 (ii) $\angle AOB$ and $\angle COD$ are supplementary.



25. Draw an equilateral triangle of side 4 cm and then another triangle whose sides are $\frac{5}{4}$ of the corresponding sides of the first triangle.

26. PQRS is a diameter of a circle of radius 6 cm. The lengths PQ, QR and RS are equal. Semi-circles PQ and QS are drawn on their respective diameter as shown in the figure. Find the perimeter of the shaded region.



27. Miss. Amrita Rao donates some part of her income to an orphanage every month. In a particular month, she wishes to donate balls for the children. For the same purpose, she decided to choose a ball of three different sizes of diameters is 7 cm, 12 cm and 18 cm respectively. Find the volume of each ball. Calculate the volume of a ball whose combined volume is equal to volumes of three balls. Why Mrs. Rao decided to donate

28. A 2 m tall boy is standing at some distance from a 29 m tall building. The angle of elevation, from his eyes to the top of the building increases from 30° to 60° , as he walks towards the building. Find the distance he walked towards the building.

29. Out of a deck of 52 playing cards, two black kings and 4 red cards (not king) are removed. A card is drawn at random. Find the probability that the card drawn is
 (A) a black jack. (B) a black queen. (C) a black card. (D) a king.

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

31. A decorative pen stand made of wood is in the shape of a cuboid with four conical depressions and a cubical depression to hold pins and paper strips respectively. The dimensions of the cuboid are $20 \text{ cm} \times 15 \text{ cm} \times 10 \text{ cm}$. The radius of each conical depression is 0.5 cm and depth 2.1 cm. The edge of cubical depression is 9 cm. Find the volume of wood used in making the entire pen stand. (Use $\pi = \frac{22}{7}$)
