

SAMPLE PAPER
Subject: Mathematics
CLASS X

M.M. 90

Time-3hrs

General instructions:

- 1- All questions are compulsory.
- 2- The question paper consists of 34 questions divided into four sections A, B, C, & D.
- 3- Section A comprises of 10 questions of 01 mark each, Section B comprises of 8 questions of 2 marks each, Section C comprises of 10 questions of 3 marks each and Section D comprises of 6 questions of 4 marks each.
- 4- All questions in Section A are multiple choice questions where you are to select one correct option out of given four.
- 5- There is no overall choice. However internal choice has been provided in one question of two marks each, 3 questions of 3 marks each and two questions of four marks each. You have to attempt only one of the alternatives in all such questions.
- 6- Use of calculators is not permitted.

Section – A

1. The distance between two parallel tangents to a circle of radius 5 cm is
(a) 10cm (b) 5cm (c) 8cm (d) 9cm
2. The probability of occurrence of event A is denoted by $P(A)$ so the range of $P(A)$ is
(a) $0 < P(A) < 1$ (b) $0 \leq P(A) < 1$ (c) $0 < P(A) \leq 1$ (d) $0 \leq P(A) \leq 1$
3. If the perimeter and area of a circle are numerically equal, the radius of the circle is
(a) 2 units (b) π units (c) 4 units (d) None of these
4. The first and last terms of an AP are 1 and 11. If the sum of all its terms is 36, then the number of terms will be
(a) 5 (b) 6 (c) 7 (d) None of these
5. For a race of 1540 m number of rounds one has to take on a circular track of radius 35m;
(a) 5 (b) 6 (c) 7 (d) 10
6. Find the distance between (0, 0) and (4, 4).
(a) 26 (b) $\sqrt{35}$ (c) $\sqrt{15}$ (d) None of these
7. One coin is tossed thrice. The probability of getting neither 3 heads nor 3 tails is:

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- (a) $\frac{1}{3}$ (b) $\frac{3}{4}$ (c) $\frac{1}{2}$ (d) $\frac{2}{3}$

8. Twelve solid spheres of the same size are made by melting a solid metallic cylinder of base diameter 2cm and height 16 cm. The diameter of each sphere is:

- (a) 4 cm (b) 3 cm (c) 2 cm (d) 6 cm

Section – B

9. In a circle of radius 10cm, an arc subtends an angle of 90° at the centre. Find the area of the major sector.

10. If all the side of a parallelogram touches a circle, show that the parallelogram is a rhombus.

11. The minute hand of a clock is $\sqrt{21}$ cm. Find the area described by the minute hand on face of the clock between 7 a.m. to 7.35 a.m.

12. 50 circular plates each of diameter 14 cm and thickness 0.5 cm are placed one above the other to form a right circular cylinder. Find its total surface area.

13. If $(-3, a)$ is image of point $(1, a + 4)$ in point $(b, 1)$, find the value of a and b .

14. Find the relation between x and y if the points (x, y) , $(1, 2)$ and $(7, 0)$ are collinear.

Section C

15. Find the probability that the month of February may have 5 Tuesdays in

- (i) A leap year (ii) A non leap year

16. Cards marked with the numbers 4 to 100 are placed in a box and mixed thoroughly. One card is drawn from this box. Find the probability that the number on the card is

- (a) an even number
(b) a number less than 12
(c) a number which is a perfect square
(d) a prime number less than 30.

17 Find the sum of all multiple of 9 lying between 100 and 500.

- 18.** 100 circular plates, each of radius 7 cm and thickness $\frac{1}{2}$ cm are placed one above another to form a Solid right circular cylinder. Find the total surface area and the volume of the cylinder so formed.
- 19.** The area of an equilateral triangle is $49\sqrt{3} \text{ cm}^2$ taking each vertex as centre; a circle is drawn with radius equal to half the length of the side of the triangle. Find the area of the triangle not included in the circles.
- 20.** Draw a line segment AB of length 8 cm. Taking A as centre, draw a circle of radius 4 cm and taking B as centre, draw another circle of radius 3 cm. Construct tangents to each circle from the centre of the other circle.
- 21.** Using A (4, -6), B(3, -2) and C(5, 2), verify that a median of the triangle ABC divides it into two triangles of equal areas.
- 22.** In a quadrilateral PQRS in circumscribed touching the circle at A, B, C and D. If AP = 5 cm, QR = 7 cm and CR = 3 cm, then find the length of PQ.
- 23.** Which term of the sequences 114, 109, 104 is the first negative term?
- 24.** Find the coordinates of the points which divide the line segment joining the points, (-8, 0) and (4, -8) into four equal parts.

Section D

- 25.** The angle of elevation of a cloud from a point 60 meters above a lake is 30° and the angle of depression of the reflection of the cloud in the lake is 60° . Find the height of the cloud.
- 26.** Prove that the parallelogram circumscribing a circle is a rhombus.
- 27.** Water is flowing at the rate of 5 km/h through a pipe of diameter 14 cm into a rectangular tank which is 50 m long and 44 m wide, Determine the time in which the level of water in the tank will rise by 7 cm.
- 28.** Anil Kumar can row her boat at a speed of 5 km/h in still water. If it takes her 1 hour more to row the boat 5.25 km upstream than to return downstream, find the speed of the stream.
- 29.** Find four terms in an A.P., whose sum is 20 and the sum of whose square is 120.

30. A person on tour has Rs 360 for his expenses. If he extends his tour for four days, he has to cut down his daily expenses by Rs 3. Find the original duration of the tour. What value those people have in it?

31. Prove that the angle between two tangents drawn from an external point to a circle is Supplementary to the angle subtended by the line segment joining the points of contact at the centre.

32. A man on the top of a vertical tower observes a car moving at a uniform speed coming directly towards him. If it takes 12 minutes for the angle of depression to change from 30 degree to 45 degree, how soon after this, will the car reach the tower? Give your answer to the nearest second.

33. Which term of A.P. 8, 14, 20, 26... will be 72 more than its 41st term?

34. A man standing on a lighthouse sees a ship coming directly towards it. If it takes to minutes for the angle of depression of the ship as seen by him to change from 30° to 60°, how soon will the boat reach the lighthouse?

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