

SUMMATIVE ASSESSMENT –II CBSE MATHEMATICS SAMPLE PAPER Class – X

Time allowed: 3 hours

General Instructions:

- a) All questions are compulsory.
- b) The question paper consists of 31 questions divided into four sections A, B, C and D.
- c) Section A contains 4 questions of 1 mark each which are multiple choice questions, Section B contains 6 questions of 2 marks each, Section C contains 10 questions of 3 marks each and Section D contains 11 questions of 4 marks each.
- d) Use of calculator is not permitted.

Section A

- 1. The famous mathematician associated with finding the sum of first 100 natural number s is: (a) Pythagoras (b) Euclid (c) Newton (d) Gauss
- 2. If the string of a kite is 75 m long and it makes an angle of 60° with the ground, then the height of kite is:

(a)
$$\frac{75}{2}$$
 m (b) $75\sqrt{3}$ m (c) $\frac{75\sqrt{3}}{2}$ m (d) 75 m

- 3. A box contains 3 blue, 2 white and 4 red marbles. If a marble is drawn at random from the box, the probability that it will not be a white marble is:
 - (a) $\frac{2}{9}$ (b) $\frac{4}{9}$ (c) $\frac{5}{9}$ (d) $\frac{7}{9}$
- 4. A point on *y*-axis equidistant from the points A (6, 5) and B-4, 3 is:
 (a) (0, 3)
 (b) (0, 4)
 (c) (0, 6)
 (d) (0, 9)

Section B

- 5. Show that x = -3 is a solution of the equation $x^2 + 6x + 9 = 0$.
- 6. Which term of the AP 21, 42, 63, 84, is 420?
- 7. In figure, BOA is a diameter of the circle and the tangent at a point P meets BA extended at T. If \angle PBO = 35°, then find \angle PTA.



Maximum Marks: 90

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- 8. The radii of two circles are 3 cm and 4 cm. Find the radius of the circle whose area is equal to the sum of areas of two circles.
- 9. A solid metallic sphere of radius 12 cm is melted and recast into a number of small cones, each of radius 4 cm and height 3 cm. Find the number of cones so formed.
- 10. Water is flowing at the rate of 15 km per hour through a pipe of diameter 14 cm into a rectangular tank which is 50 m long and 44 m wide. Find the time in which the level of water in the tank will rise by 21 m.

Section C

11. Solve the quadratic equation by quadratic formula:

$$\frac{1}{2}x^2 - \sqrt{11}x + 1 = 0$$

- 12. Find the sum of all two digit natural numbers which when divided by 3 yield 1 as remainder.
- 13. In figure, ABC is a right angled triangle with AB = 6 cm and AC = 8 cm. A circle with centre 0 has been inscribed inside the triangle. Calculate the value of r, the radius of the inscribed circle.



- 14. From the top of a hill 200 m high, the angles of depression of the top and the bottom of a pillars are 30° and 60° respectively. Find the height of the pillar and its distance from the hill
- 15. Red kings, queens and jacks are removed from a deck of 52 playing cards and then wellshuffled. A card is drawn from the remaining cards. Find the probability of getting:
 - (i) a king.
 - (ii) a red card.
 - (iii) a spade.
- 16. Find the value of p for which the points (-1,3), (2, p) and (5,-1) are collinear.
- 17. Prove that the points (3, 0), (6, 4) and (-1, 3) are vertices of a right angled triangle. Also, prove that the vertices of an isosceles triangle.
- 18. A copper wire when bent in the form of a square encloses an area of 121 cm². If the same wire is bent into the form of a circle, then find the area of the circle. $\left(\text{Use } \pi = \frac{22}{7}\right)$
- 19. The circumference of a circular plot is 220 m. A 15 m wide concrete track runs around outside the plot. Find the area of the track. $\left(\text{Use } \pi = \frac{22}{7}\right)$

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20. A hemispherical bowl of internal radius 9 cm is full of liquid. The liquid is to be filled into cylindrical shaped small bottles each of diameter 3 cm and height 4 cm. How many bottles are needed to empty the bowl?

Section D

- 21. Solve for x: $\frac{1}{p+q+x} = \frac{1}{p} + \frac{1}{q} + \frac{1}{x}$; $p \neq 0, q \neq 0, p+q+x \neq 0$
- 22. A trader bought a number of articles for Rs.900. Five articles were found damaged. He sold each of the remaining articles at Rs.80 in the whole transaction. Find the number of articles he bought.
- 23. Nidhi saves Rs. 2 on first day of the month, Rs. 4 on second day, Rs. 6 on third day and so on. Read the above passage and answer the following questions:
 - (i) What will be her saving in the month of February?
 - (ii) What value is depicted by Nidhi?

[Value Based Question]

24. Two tangents TP and TQ are drawn to a circle with centre O from an external point T. Prove that \angle PTQ = 2 \angle OPQ.



25. Prove that the tangent at any point of a circle is perpendicular to the radius through the point of contact.

Using the above result, find the length of PQ, if a tangent PQ at a point P of a circle of radius 5 cm meets a line through the centre O at a point Q so that OQ = 12 cm.

26. Construct a \triangle ABC in which BC = 6.5 cm, AB = 4.5 cm and \angle ACB = 60°. Construct another triangle similar to \triangle ABC such that each side of new triangle is $\frac{4}{5}$ of the corresponding sides of

 Δ ABC.

- 27. An aeroplane flying at a height of 4000 m from the ground passes vertically above another aeroplane at an instant when the angle of elevation of the two planes from the same point as the ground are 60° and 45° respectively. Find the vertical distance between the aeroplanes at that instant.
- 28. A bag contains 4 white balls, 6 red balls, 7 black balls and 3 blue balls. One ball is drawn at random from the bag. Find the probability that the ball drawn is:

(i) white	(ii) not black
(iii) noithar white nor black	(iv) rod or white

(iii) neither white nor black (iv) red or white



- 29. If '*a*' is the length of one of the sides of an equilateral triangle ABC, base BC lies on x-axis and vertex B is at the origin, then find the coordinates of the vertices of the triangle ABC.
- 30. A solid is in the form of a right circular cylinder with hemispherical ends. The total height of

the solid is 28 cm. Find the total surface area of the solid. $\left(\text{Use } \pi = \frac{22}{7} \right)$



31. A bucket is in the form of a frustum of a cone with capacity 12305.8 cm³ of water. The radii of the top and bottom circular ends are 20 cm and 12 cm respectively. Find the total height of the bucket and the area of the metal sheet used in its making. (Use $\pi = 3.14$)