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SUMMATIVE ASSESSMENT –II
CBSE SAMPLE PAPER MATHEMATICS
Class – X

Time allowed: 3 hours | Maximum Marks: 90

General Instructions:

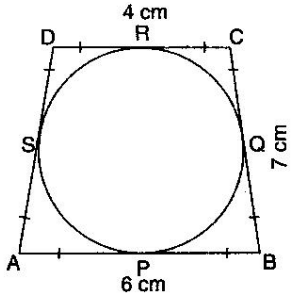
a) All questions are compulsory.
b) The question paper consists of 31 questions divided into four sections – A, B, C and D.
c) Section A contains 4 questions of 1 mark each which are multiple choice questions, Section B contains 6 questions of 2 marks each, Section C contains 10 questions of 3 marks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

Section A

1. The 7^{th} term of the AP $-5, \frac{-5}{2}, 0, \frac{5}{2}, \ldots\ldots$ is
   (a) 10 (b) 15 (c) 5 (d) 20
2. The length of shadow of a tower on the plane ground is $\sqrt{3}$ times the height of the tower. The angle of elevation of Sun is:
   (a) 30° (b) 45° (c) 60° (d) 90°
3. A die has it 6 faces marked 0, 1, 1, 1, 4, 4. Two such dice are thrown together and the total sum is recorded. How many different sums are possible?
   (a) 3 (b) 4 (c) 5 (d) 6
4. The perpendicular distance of the point P (4, 2) from the $x-$axis is:
   (a) 4 units (b) 6 units (c) 2 units (d) 8 units

Section B

5. Solve: $p^2x^2 - q^2 = 0$
6. First two terms of an AP are -5 and -7. Find its 11^{th} term.
7. In figure, a circle touches all the four sides of a quadrilateral ABCD whose sides AB = 6 cm, BC = 7 cm and CD = 4 cm. Find AD.

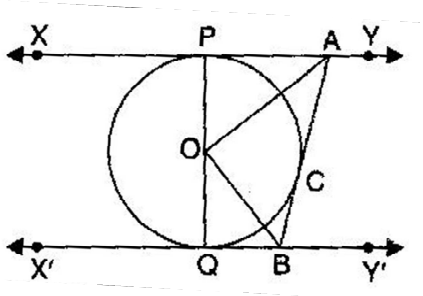


8. Area of a sector of central angle $120°$ of a circle is 3π cm^2. Find the length of the corresponding arc of this sector.
9. The internal and external diameters of a hollow hemispherical shell are 6 cm and 10 cm respectively. It is melted and recast into a solid cone of base diameter 14 cm. Find the height of the cone so formed.
10. A conical vessel whose internal radius is 5 cm and height 24 cm is full of water. The water is emptied into a cylindrical vessel with internal radius 10 cm. Find the height to which the water rises.

Section C

11. Solve for x: $a^2b^2x^2 + b^2x - a^2x - 1 = 0$
12. Find the sum of all three digit numbers which are divisible by 7.

13. In figure, XY and X'Y' are two parallel tangents to a circle with centre O and another tangent AB touching at C, intersecting XY at A and X'Y' at B. Prove that $\angle AOB = 90°$.



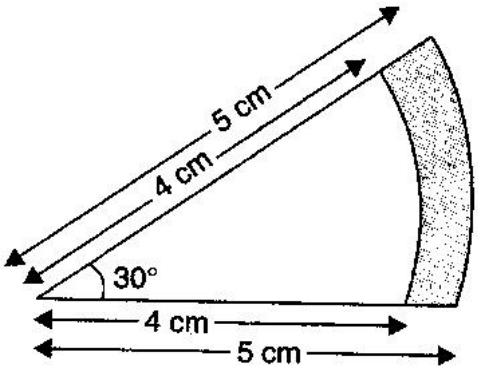
14. A man on the top of a vertical tower observes a car moving at uniform speed towards the tower. If it takes 12 minutes for the angle of depression to change from $30°$ to $45°$, how soon after this will the car reach the tower?

15. A die is thrown once. Find the probability of getting:
    (i) a prime number
    (ii) a number lying between 2 and 6
    (iii) an odd number.

16. The line segment joining the points $(3,-4)$ and $(1,2)$ is trisected at the points P and Q. If the coordinates of P and Q are $(p,-2)$ and $\left(\frac{5}{3},q\right)$ respectively, then find the values of p and q.

17. Prove that the points (0, 0), (5, 5) and $(-5,5)$ are the vertices of a right isosceles triangle.

18. Find the area of the shaded region.



19. The short and long hands of a clock are 4 cm and 6 cm respectively. Find the sum of the distances travelled by their tips in two days. $\left(\text{Use } \pi = \frac{22}{7}\right)$

20. Two solid right circular cones have the same height. The radii of their bases are r_1 and r_2. They are melted and recast into a cylinder of same height. Show that the radius of the base of the cylinder is $\sqrt{\frac{r_1^2 + r_2^2}{3}}$.

Section D

21. Solve for x: $\frac{1}{x+3} - \frac{1}{x-6} = \frac{9}{20}, \quad x \neq -3, 6$

22. The sum of two numbers is 8. Determine the numbers if the sum of their reciprocal is $\frac{8}{15}$.

23. A sum of Rs.1000 is invested at 8% simple interest per annum. Calculate the interest at the end of 1, 2, 3, ... Years. If the sequences of interests an AP? Find the interest at the end of 30 years.

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

25. Prove that the parallelogram circumscribing a circle is a rhombus.

26. Draw a circle of radius 3.5 cm. Take a point T outside circle at a distance of 7 cm from the centre and construct a pair of tangents from this point T to the circle and justify your construction.

27. If the angle of elevation of a cloud from a point h meters above a lake is α and the angle of depression of its reflection in the lake is β, prove that the distance of the cloud from the point of observation is $\frac{2h\sec\alpha}{\tan\beta - \tan\alpha}$.

28. (i) Find the probability of getting 53 Fridays in a leap year.
(ii) A die is thrown, find the probability of getting an odd prime numbers.

29. If the coordinates of the mid-points of the sides of a triangle are $(1,1),(2,-3)$ and $(3,4)$, then find the centroid.

30. An ice-cream seller has two types of ice-cream container in the form of cylindrical shape and a cone with hemispherical base. Both have same height of 7 cm and same diameter of 7 cm. The costs of both the containers are same but the seller decides to sell in cylindrical containers.
(i) Calculate the volume of both containers.
(ii) Which value is depicted by the seller?

[Value Based Question]

31. The radii of the ends of the frustum of a right circular cone are 5 m and 8 m and its lateral height is 5 cm. Find the lateral surface and volume of the frustum. (Use $\pi = 3.142$)