Time Allowed: **2 Hours**   **CBSE Sample Mock Test Term 2**   *Maximum Marks*: **40**

General Instructions:
1. This question paper contains two parts, A and B.
2. Both Part A and Part B have internal choices.

Part-A:
1. It consists of two sections, I and II.
2. Section I has 7 questions of 1 mark each. Internal choice is provided in 2 questions.
3. Section II has 2 questions on case study. Each case study has 5 case-based sub-parts. An examinee is to attempt any 4 out of 5 sub-parts.

Part-B:
1. Question No. 10 to 12 in section III are Short Answer Type-I questions of 2 marks each.
2. Question No. 13 to 15 in section IV are Short Answer Type-II questions of 3 marks each.
3. Question No. 16 and 17 in section V are Long Answer Type questions of 5 marks each.
4. Internal choice is provided in 1 question of 2 marks, 1 question of 3 marks and 1 question of 5 marks.
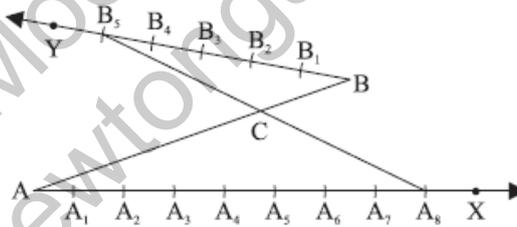
PART-A
SECTION-I

1. For what values of k, the equation $9x^2 + 6kx + 4 = 0$ has equal roots?   1

2. For what value(s) of 'a' quadratic equation $3ax^2 - 6x + 1 = 0$ has no real roots?   1

OR

Find the roots of the equation $x^2 + 7x + 10 = 0$

3. In the figure, if $B_1, B_2, B_3, \ldots$ and $A_1, A_2, A_3, \ldots$ have been marked at equal distances, in what ratio C divides AB? 1

4. 12 solid spheres of the same radii are made by melting a solid metallic cylinder of base diameter 2 cm and height 16 cm. Find the diameter of the each sphere.   1

5. Two cones have their heights in the ratio 1 : 3 and radii in the ratio 3 : 1. What is the ratio of their volumes?   1

OR

Find the radius of the largest right circular cone that can be cut out from a cube of edge 4.2 cm.

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6. **Assertion (A)** : $4x^2 - 12x + 9 = 0$ has repeated roots.

   Reason (R) : The quadratic equation $ax^2 + bx + c = 0$ have repeated roots if discriminant D > 0.   1

7. **Assertion (A)** : If the number of runs scored by 11 players of a cricket team of India are 5, 19, 42, 11, 50, 30, 21, 0, 52, 36, 27, then median is 30.

   Reason (R) : Median = $\left(\dfrac{n+1}{2}\right)^{th}$ value, if n is odd.   1

SECTION-II

Case Study based questions Q8 and Q9 are compulsory. Attempt any four sub-parts of each question.

8. **Case Study-1**

Adventure Camp

Adventure camps are the perfect place for children to practice decision making for themselves without parents and teachers guiding their every move.

Some students of a school reached for adventure at Mukteshwar. At the camp, the waiters served some students with a welcome drink in a cylindrical glass and some students in a hemispherical cup whose dimensions are shown above.
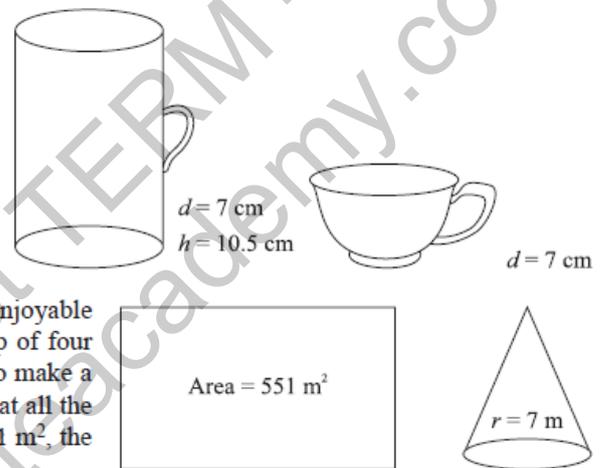
After that they went for the jungle trek. The jungle trek was enjoyable but tiring. As dusk fell, it was time to take shelter. Each group of four students was given a canvas of area 551 m². Each group had to make a conical tent to accommodate all the four students. Assuming that all the stitching and wasting incurred while cutting, would amount to 1 m², the students put the tents. The radius of the tent is 7 m.

d = 7 cm
h = 10.5 cm

d = 7 cm

Area = 551 m²

r = 7 m

Refer to Glass and Cup

(i) The volume of cylindrical glass is   1

    (a) 295.75 cm³   (b) 7415.5 cm³   (c) 384.88 cm³   (d) 404.25 cm³

(ii) The volume of hemispherical cup is   1

    (a) 179.67 cm³   (b) 89.83 cm³   (c) 172.25 cm³   (d) 210.60 cm³

(iii) Which container had more juice and by how much?   1

    (a) Hemispherical cup, 195 cm³   (b) Cylindrical glass, 207 cm³

    (c) Hemispherical cup, 280.85 cm³   (d) Cylindrical glass, 314.42 cm³

Refer to Tent

(iv) The height of the conical tent prepared to accommodate 4 students is   1

    (a) 18 m   (b) 10 m   (c) 24 m   (d) 14 m

(v) How much space on the ground is occupied by each student in the conical tent?   1

    (a) 54 m²   (b) 38.5 m²   (c) 86 m²   (d) 24 m²

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9. **Case Study-2**

100 m Race

A stopwatch was used to find the time that it took a group of students to run 100 m.

| Time (in sec.)	0-20	20-40	40-60	60-80	80-100
No. of students	8	10	13	6	3

(i) The estimated mean time taken by a student to finish the race is   1

   (a) 54   (b) 63   (c) 43   (d) 50

(ii) What will be the upper limit of the modal class?   1

   (a) 20   (b) 40   (c) 60   (d) 80

(iii) The construction of cumulative frequency table is useful in determining the   1

   (a) mean   (b) median   (c) mode   (d) All of these

(iv) The sum of lower limits of median class and modal class is   1

   (a) 60   (b) 100   (c) 80   (d) 140

(v) How many students finished the race within 1 minute?   1

   (a) 18   (b) 37   (c) 31   (d) 8

PART-B

SECTION-III

10. How many two-digit numbers are divisible by 3?   2

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11. In the figure, quadrilateral ABCD is circumscribing a circle with centre O and AD ⊥ AB. If radius of incircle is 10 cm, then find the value of x. **2**
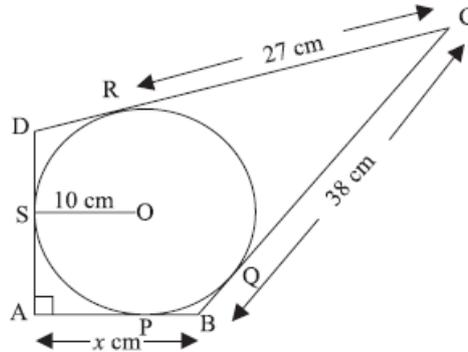
OR

In the given figure, two tangents TP and TQ are drawn to a circle with centre O from an external point T.
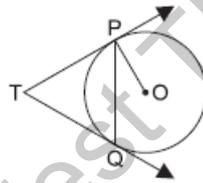
Prove that: ∠PTQ = 2∠OPQ.

12. A kite is flying at a height of 90 m above the ground. The string attached to the kite is temporarily tied to a point on the ground. The inclination of the string with the ground is 60°. Find the length of the string assuming that there is no slack in the string. **2**

SECTION-IV

13. In the figure, ABCD is a square of side 14 cm. Semicircles are drawn with each side of square as diameter. Find the area of the shaded region. **3**
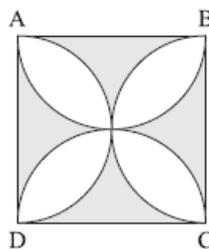
14. Draw a line segment AB of length 7 cm. Taking A as centre, draw a circle of radius 3 cm and taking B as centre, draw another circle of radius 2 cm. Construct tangents to each circle from the centre of the other circle. **3**

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15. The median of the following data is 16. Find the missing frequencies a and b, if the total of the frequencies is 70.   **3**

Class	0-5	5-10	10-15	15-20	20-25	25-30	30-35	35-40
Frequency	12	a	12	15	b	6	6	4

OR

The following distribution shows the daily pocket allowance of children of a locality. The mean pocket allowance is ₹ 18. Find the missing frequency k.

Daily pocket allowance (in ₹)	11–13	13–15	15–17	17–19	19–21	21–23	23–25
Number of children	3	6	9	13	k	5	4

SECTION-V

16. Solve for x : $\dfrac{1}{x+1} + \dfrac{2}{x+2} = \dfrac{4}{x+4}$ $x \neq -1, -2, -4$ **5**

17. The two palm trees are of equal heights and are standing opposite to each other on either side of the river, which is 80 m wide. From a point O between them on the river, the angles of elevation of the top of the trees are 60° and 30°, respectively. Find the height of the trees and the distances of the point O from the trees.   **5**

OR

The angles of depression of the top and bottom of a building 50 metres high as observed from the top of a tower are 30° and 60° respectively. Find the height of the tower, and also the horizontal distance between the building and the tower.

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