IIITB COMET FOUNDATION

Name: Ranjita
ID: COMETFWC055
Date: 23 January 2026

CBSE – MATHEMATICS

Question Paper

Class: X **Time: 3 Hours**

21. A wooden article was made by scooping out a hemisphere from each end of a solid cylinder, as shown in Fig. 3. If the height of the cylinder is 10 cm and its base has radius 3.5 cm, find the total surface area of the article.

Figure 1: Fig. 3

OR

A heap of rice is in the form of a cone of base diameter 24 m and height 3.5 m. Find the volume of the rice. How much canvas cloth is required to just cover the heap?

22. The table below shows the salaries of 280 persons:

Salary (in thousand Rs)	No. of Persons
5–10	49
10–15	133
15–20	63
20–25	15
25–30	6
30–35	7
35–40	4
40–45	2
45–50	1

Calculate the median salary of the data.

23. A motor boat whose speed is 18 km/hr in still water takes 1 hour more to go 24 km upstream than to return downstream to the same spot. Find the speed of the stream.

OR

A train travels at a certain average speed for a distance of 63 km and then travels 72 km at a speed 6 km/hr more than its original speed. If the total time taken is 3 hours, find the original speed.

SECTION – C

Question numbers 24 to 30 carry 4 marks each.

24. The sum of four consecutive numbers in an AP is 32 and the ratio of the product of the first and last term to the product of the two middle terms is 7 : 15. Find the numbers.

25. In an equilateral triangle $\triangle ABC$, D is a point on side BC such that

$$BD = \frac{1}{3}BC$$

Prove that

$$9(AD)^2 = 7(AB)^2$$

OR

Prove that in a right triangle, the square on the hypotenuse is equal to the sum of the squares on the other two sides.

26. Draw a triangle ABC with $BC = 6$ cm, $AB = 5$ cm and $\angle ABC = 60°$. Construct a triangle similar to it whose sides are $\frac{3}{4}$ of the corresponding sides of $\triangle ABC$.

27. Prove that:

$$\frac{\sin A - 2\sin^3 A}{2\cos A - \cos A} = \tan A$$

28. The diameters of the lower and upper ends of a bucket in the form of a frustum of a cone are 10 cm and 30 cm respectively. If its height is 24 cm, find:

    (a) the area of the metal sheet used,

    (b) why ordinary plastic buckets should be avoided.

    (Take $\pi = 3.14$)

29. From the top of a 100 m high lighthouse, the angles of depression of two ships are 30° and 45°. Find the distance between the two ships. (Take $\sqrt{3} = 1.732$)

30. The mean of the following distribution is 18. Find the frequency of the class 19–21.

Class	11–13	13–15	15–17	17–19	19–21
Frequency	3	6	9	13	f

OR

The following distribution gives the daily income of 50 workers of a factory. Convert it into a less-than cumulative frequency distribution and draw its ogive.