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Q1. The daily expenditure of 100 families are given below. Calculate f<sub>1</sub> and f<sub>2</sub> if the mean daily expenditure 5 Marks is ₹188.

Expenditure (in Rs.)	140-160	160-180	180-200	200-220	220-240
Number of families	5	25	f <sub>1</sub>	$f_2$	5

**Q2.** If the numbers a, 9, b, 25 form an AP, find a and b.

5 Marks

**Q3.** Prove that  $\frac{1}{(\sec\theta - \tan\theta)} - \frac{1}{\cos\theta} = \frac{1}{\cos\theta} - \frac{1}{(\sec\theta + \tan\theta)}$ .

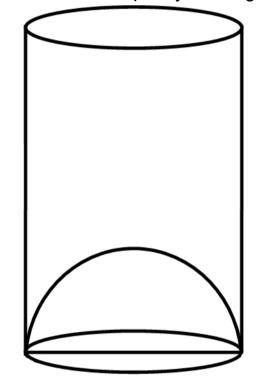
5 Marks

**Q4.** The sum of the digits of a two-digit number is 12. The number obtained by interchanging its digits exceeds the given number by 18. Find the number.

5 Marks

Q5. The inner diameter of a glass is 7cm and it has a raised portion in the bottom in the shape of a hemisphere, as shown in the figure. If the height of the glass is 16cm, find the apparent capacity and the actual capacity of the glass.

5 Marks



### 2<sup>ND</sup> JAN 2026 TO 10<sup>TH</sup> FEB 2026

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**Q6.** Prove the following identities:

5 Marks

If  $x = a \sec \theta + b \tan \theta$  and  $y = a \tan \theta + b \sec \theta$ , prove that  $(x^2 - y^2) = (a^2 - b^2)$ .

**Q7.** Prove the following identities:

 $\frac{(\sin A - \sin B)}{(\cos A + \cos B)} + \frac{(\cos A - \cos B)}{(\sin A + \sin B)} = 0$ 

5 Marks

Q8. A boat goes 12km upstream and 40km downstream in 8 hours. It can go 16km upstream in 8 hours. It 5 Marks can go 16km upstream and 32km downstream in the same time. Find the speed of the boat in still water and the speed of the stream.

**Q9.** The following table gives the daily income of 50 workers of a factory:

5 Marks

Daily income (in Rs)	100-120	120-140	140-160	160-180	180-200
Number of workers	12	14	8	6	10

Find the mean, mode and median of the above data.

**Q10.** If twice the son's age in years is added to the father's age, the sum is 70 years. But, if twice the father's **5 Marks** age is added to the son's age, the sum is 95 years. Find the age of the father and son.