Q1. The daily expenditure of 100 families are given below. Calculate f_1 and f_2 if the mean daily expenditure is ₹188. **5 Marks**

| Expenditure (in Rs.)	140-160	160-180	180-200	200-220	220-240
Number of families	5	25	f_1	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**
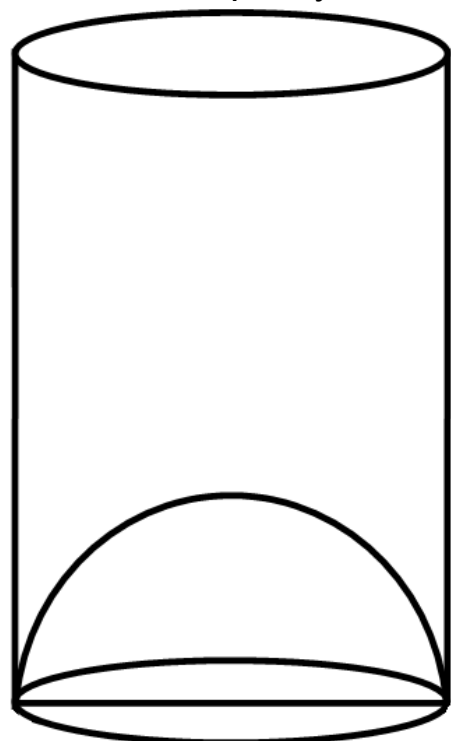
Q6. Prove the following identities: **5 Marks**
If $x = a\sec\theta + b\tan\theta$ and $y = a\tan\theta + b\sec\theta$, prove that $(x^2 - y^2) = (a^2 - b^2)$.

Q7. Prove the following identities: **5 Marks**
$\frac{(\sin A - \sin B)}{(\cos A + \cos B)} + \frac{(\cos A - \cos B)}{(\sin A + \sin B)} = 0$

Q8. A boat goes 12km upstream and 40km downstream in 8 hours. It can go 16km upstream in 8 hours. It 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. **5 Marks**

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 age is added to the son's age, the sum is 95 years. Find the age of the father and son. **5 Marks**