



- Notes :
1. All questions carry equal marks.
 2. Due credit will be given to neatness and adequate dimensions.
 3. Assume suitable data wherever necessary.
 4. Illustrate your answers wherever necessary with the help of neat sketches.
 5. I.S.I. Hand Book for structural steel section, I.S. Code 8000/1962 or 1964, I.S. 456 (Revised), I.S. 875 may be consulted.

1. Analyse a building frame for earthquake load are shown in figure spacing of frame is 3.5 m c/c live load intensity on all floor is 3 kN/m^2 . Dead load intensity on all floors is 4 kN/m^2 . Dead load of wall on the beam is 17 kN/m . Main beams are $300 \times 500 \text{ mm}$ in size and transverse beam are $280 \times 400 \text{ mm}$ in size. Inner column are $300 \times 650 \text{ mm}$ and outer column are $250 \times 450 \text{ mm}$ in size. Building lies in earthquake zone III. Draw SFD, BMD. **35**

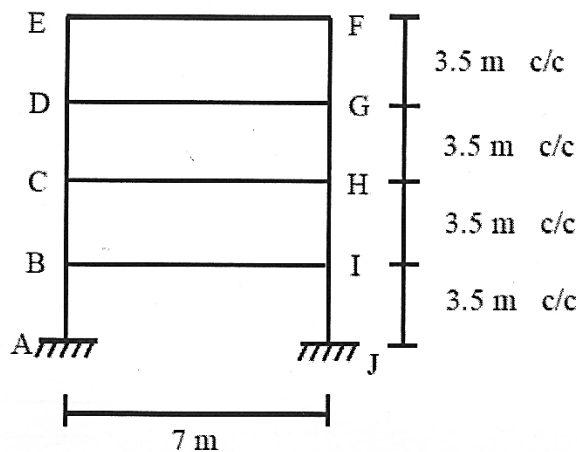


Figure 1

OR

2. Design a Intze tank for 8.5 lac liters capacity resting on eight nos. of columns with staging height 12.5 m where the wind intensity is 1.5 kN/m^2 . Use M25 grade of concrete and Fe415 steel SBC. of soil is 250 kN/m^2 . Sketch reinforcement details. **35**
3. Design a RCC box culvert having clear vent way $4.0 \text{ m} \times 4.0 \text{ m}$ in size dead load on culvert is 20 kN/m^2 and live load 50 kN/m^2 density of soil = 18 kN/m^3 . $\phi = 30^\circ$ and SBC of soil in 200 kN/m^2 . Use M25 concrete and fe 500 steel. Sketch in reinforcement details. **35**

OR

4. Design circular RCC silo of 15 m height and 5.5 m internal diameter to store cement of unit weight 15.5 kN/m^3 and $\phi = 25^\circ$. Use M20 concrete and Fe415 grade of steel. SBC of soil is 300 kN/m^2 . **35**
