

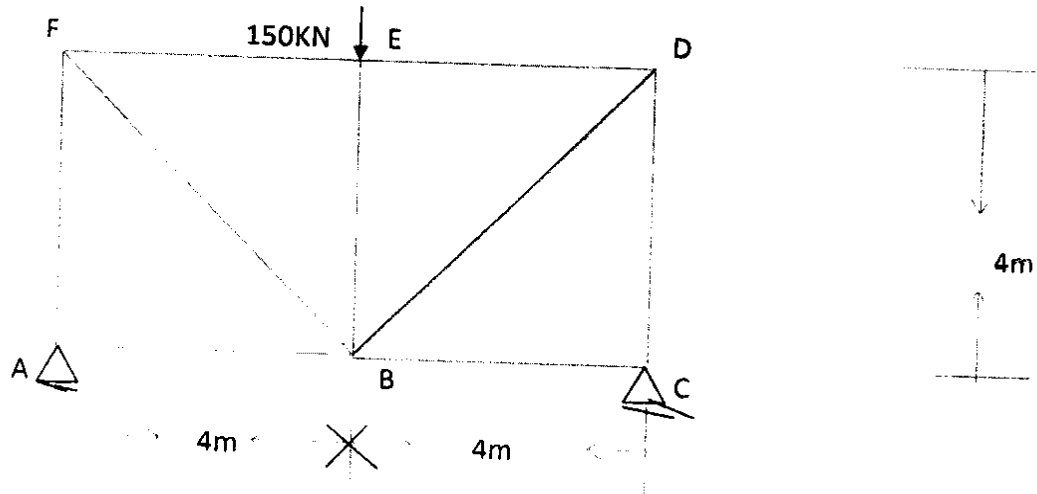
Sub: Structural Mechanics-II.

Time : Three hours

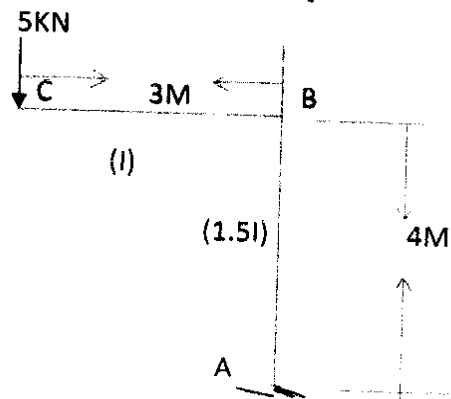
Answer any five questions (20×5=100)

Full Marks : 100

1. Determine the vertical downward deflection at point B of the truss as shown in figure. The cross sectional area of $AB=BC=DE=EF=6000 \text{ mm}^2$, $DB=BF=3000$, $AF=CD=3000 \text{ mm}^2$, Take $E=2 \times 10^5 \text{ N/mm}^2$.

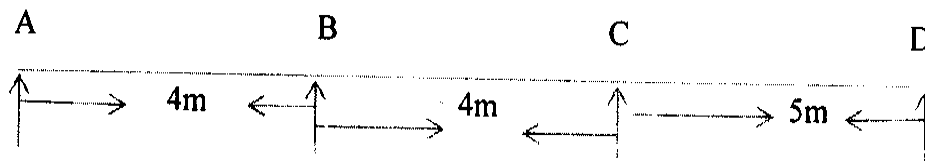


2. A) Determine the Horizontal deflection of Point C in the frame as shown in Figure. Take $E=2 \times 10^5 \text{ N/mm}^2$, $I=30 \times 10^6$. [10+10=20.]



B) Established the equation of Total strain energy $U = \int \frac{M^2}{2EI} dx$.

3. Draw the SFD & BMD of the continuous beam as shown in figure. Use Three moments equations. $AB=20\text{KN/m}$, $BC=25\text{KN/m}$, $CD=20\text{KN/m}$.



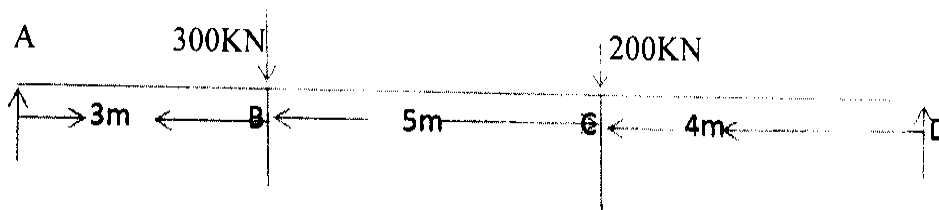
4. State & explain the Castigliano's 1st principle. [10+10=20]

A simple supported beam of Span L , carries a concentrated load P at a distance a from the left end side support. Using castigliano's theorem determines the deflection under the load. Assume EI is constant.

5. State & explain the claypeyrons three moments theorem.[10+10=20]

What do you mean by conjugate beam? Write the assumptions of conjugate beam.

6. Find the slope & deflection of the continuous beam as shown in figure. Assume any other data if required. Apply conjugate beam method. $AB= I$, $BC=1.5I$, $CD=2I$



7. State & explain the Moment area theorem. Find the deflection at point c using moment area theorem. Take $EI=8000\text{Kn m}^2$

