



TE Civil Sem V

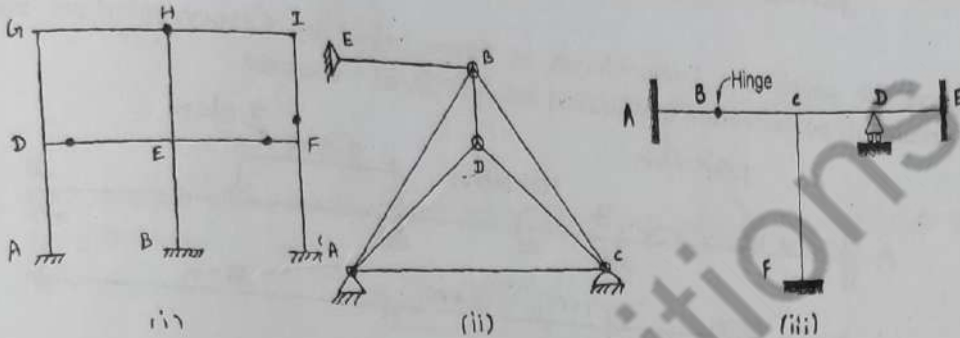
Choice Based
(3 Hours)

15 NOV 2018

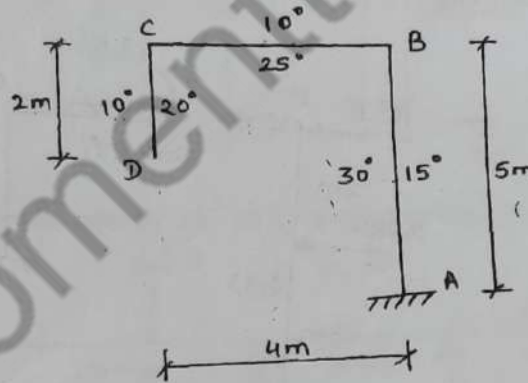
Max Marks: 80

- N.B (1) Question No.1 is compulsory.
 (2) Attempt any three questions of the remaining five questions.
 (3) Assume suitable data if required.
 (4) Figures to the right indicate full marks.

- Q1. a) For the structures shown below, determine
 i) Static indeterminacy (clearly indicating external and internal). (03)
 ii) Kinematic indeterminacy (consider axial rigidity of flexural members). (03)

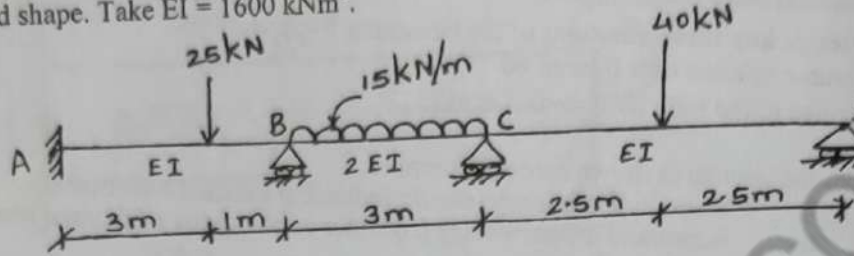


- b) For a rigid jointed frame subjected to temperature variation as shown in figure. Determine the horizontal deflection at 'D'. Assume depth of all members as 250 mm, neglect axial forces. Assume $\alpha = 12 \times 10^{-6} / ^\circ\text{C}$. (07)

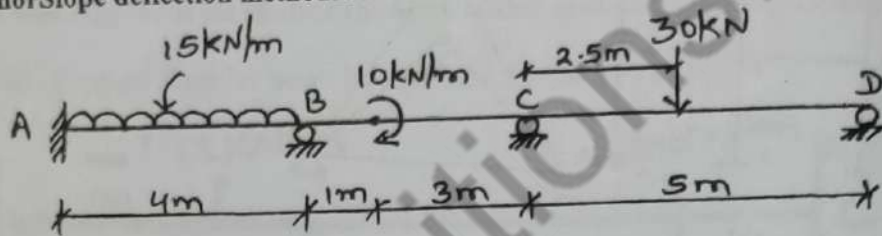


- c) Define flexibility and stiffness, and state the relation between them. (03)
 d) Define and explain distribution factor and carry over factor. (04)

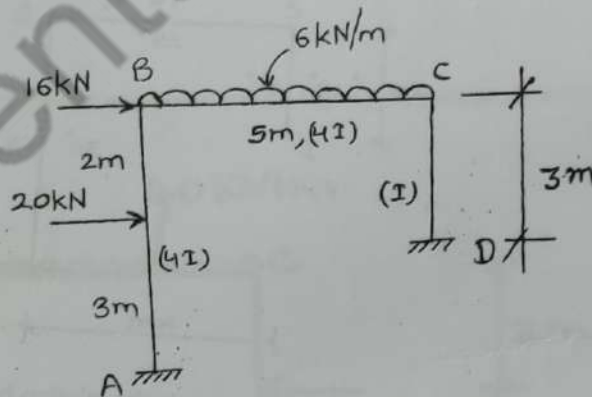
- Q2). a) Analyse the continuous beam shown in figure below by **Moment distribution method** or **Kani's method**. Note that Support 'B' sinks by 12 mm during loading. Draw BMD and deflected shape. Take $EI = 1600 \text{ kNm}^2$.



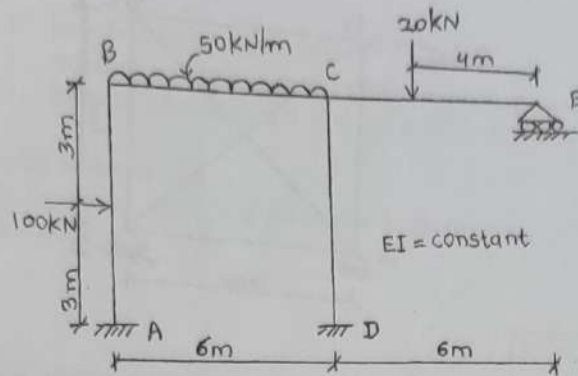
- b) Analyse the continuous beam shown in figure below by **Clapeyron's three moment theorem** or **Slope deflection method** and draw BMD. $EI = \text{constant}$.



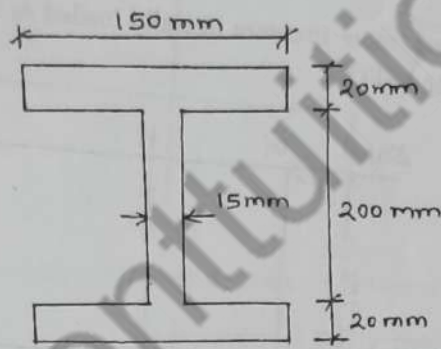
- Q3). Using **Flexibility matrix method** analyse the portal frame shown in figure below. Draw BMD and deflected shape.



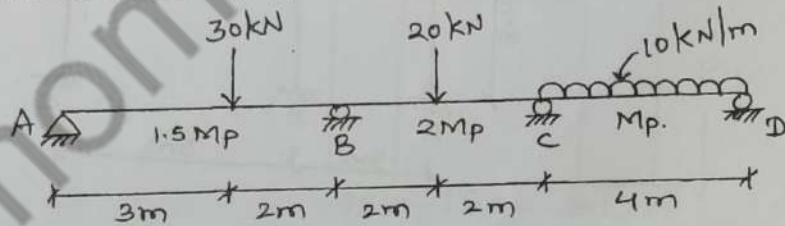
Q4). Using **Stiffness matrix method**, analyse the given portal frame. Draw BMD and deflected shape. (20)



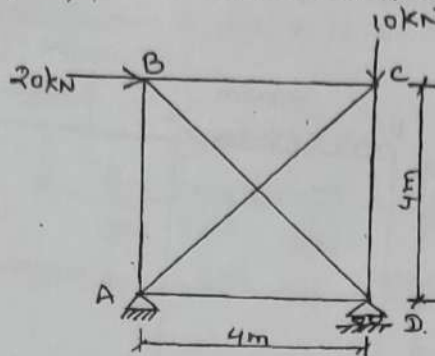
Q5). a) Find the shape factor for the beam cross section shown in figure below and find ' M_p ', if $F_y = 250 \text{ N/mm}^2$. (04)



b) Find the plastic moment capacity ' M_p ' for the continuous beam shown in figure below. (08)



- c) Analyse the pin jointed plane frame shown in figure below by force method. (08)



- Q6). a) Draw stress diagram of elastic state, elasto-plastic state and fully plastic state for a beam of rectangular cross section. (04)
- b) Derive an expression of horizontal thrust for two hinged parabolic arch subjected to UDL throughout. (06)
- c) Analyse the two storied frame structure laterally loaded as shown in figure using cantilever method. Draw BMD and SFD. (10)

