

(3 HOURS)

[TOTAL MARKS 80]

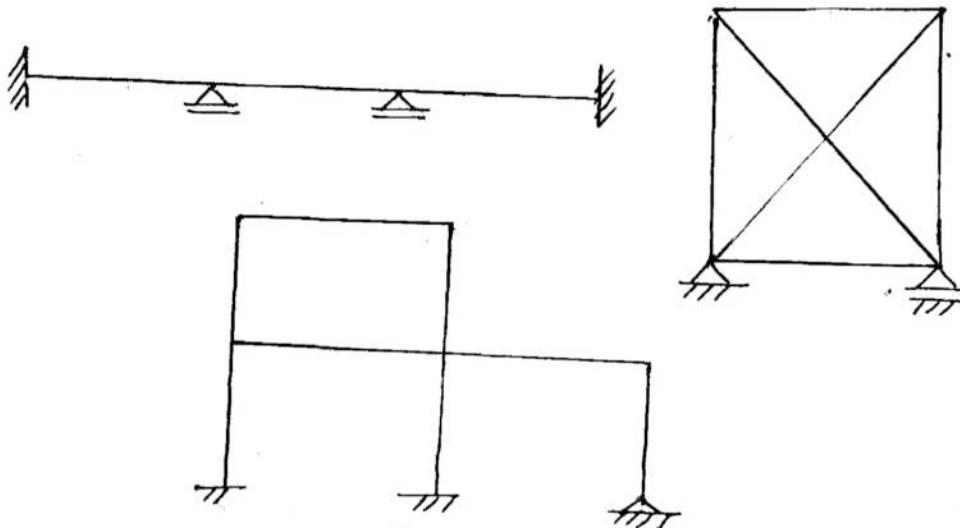
Please Note:

- 1) Question no 1 is compulsory
- 2) Attempt any three questions from remaining questions
- 3) Assume suitable data if required and justify the same.

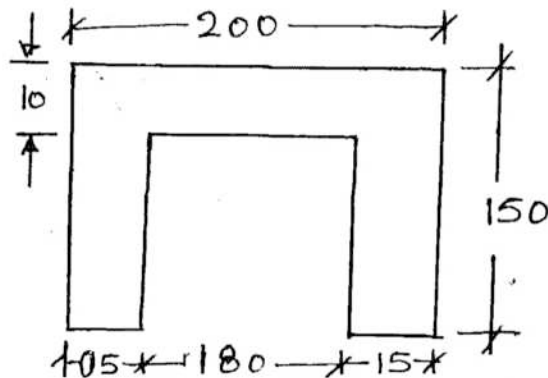
Q1.

Attempt following

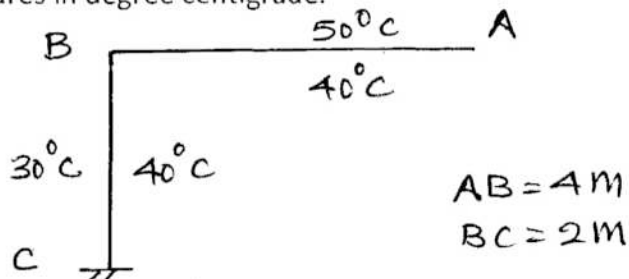
- (a) Find degree of static and kinematic indeterminacy of following structures 06



- (b) Find the shape factor of the section shown in following figure. 08

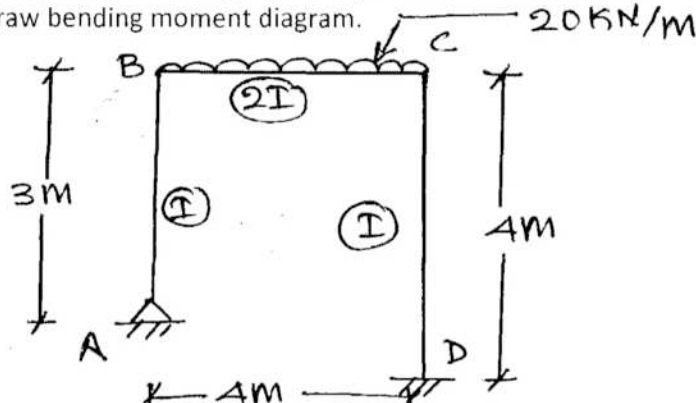


- (c) For the rigid frame subjected to temperature variation shown in figure. Find horizontal deflection at A. Assume depth of all members as 400mm. Take $\alpha = 12 \times 10^{-6} / 0_C$. All temperatures in degree centigrade. 06

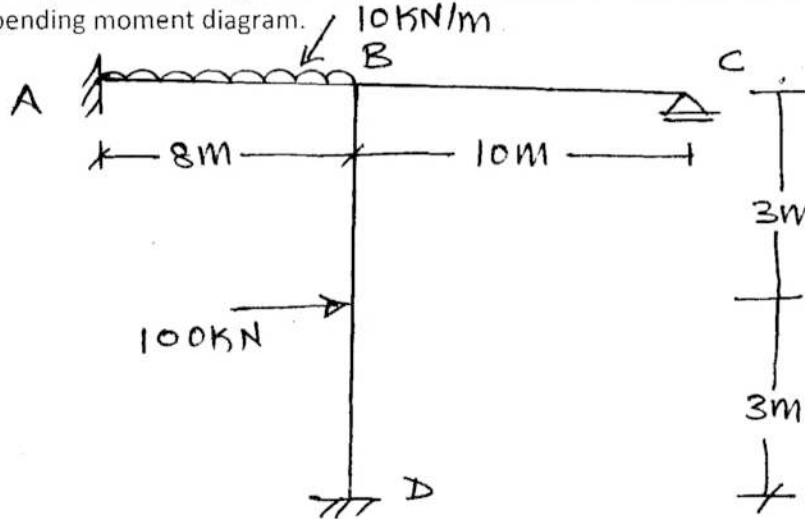


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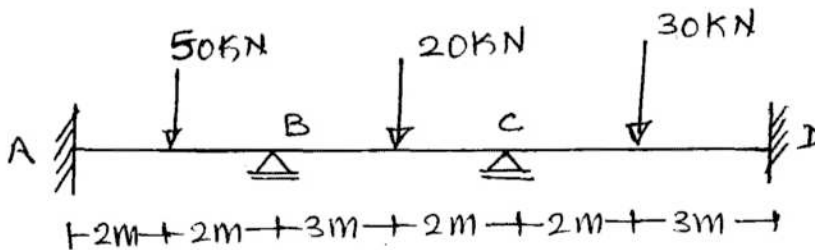
- Q2 (a) Explain the application of virtual method with suitable example. 05
 (b) Analyse the following frame by moment distribution method and draw bending moment diagram. 15



- Q3 (a) Compare statically determinate and indeterminate structures. 05
 (b) Analyse the following frame by slope deflection method and draw bending moment diagram. 15

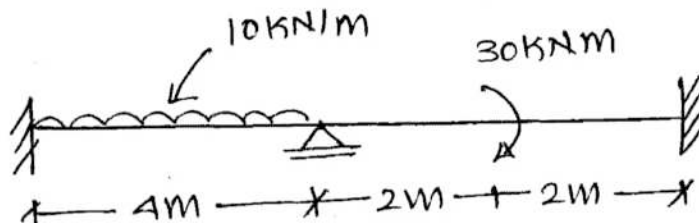


- Q4 (a) Using stiffness method analyse the following beam and draw bending moment diagram. 10



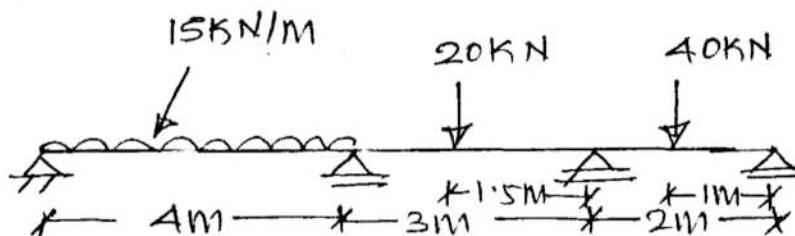
TURN OVER

- (b) Analyse the following beam using theorem of three moments and draw bending moment diagram. 10

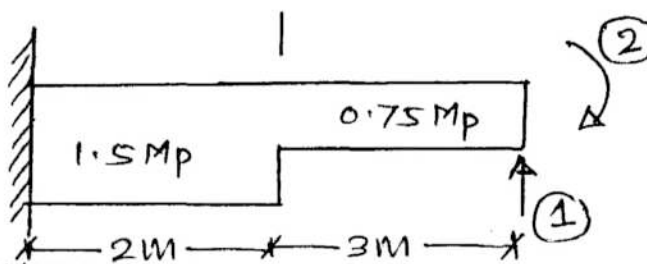


- Q5 (a) A two hinged parabolic arch of span 20 m and rise 6 m carries a UDL of 20 kN/m over the right half span and concentrated load of 75 kN at crown. Analyse the arch and draw bending moment diagram. 10

- (b) Determine the collapse load for the beam shown in following figure. 10



- Q6 (a) Develop flexibility matrix for the member shown in figure with reference to coordinates shown in figure. 10



- (b) Explain following terms 10
1. Shape factor
 2. Carry over moment
 3. Distribution factor
 4. Anti symmetrical loading