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Total No. of Questions : 09]

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[Total No. of Pages : 05

B.Tech. (Sem. - 5th)

STRUCTURAL ANALYSIS - II

SUBJECT CODE : CE - 305

Paper ID : [A0614]

[Note : Please fill subject code and paper ID on OMR]

Time : 03 Hours

Maximum Marks : 60

Instruction to Candidates:

- 1) Section - A is **Compulsory**.
- 2) Attempt any **Four** questions from Section - B.
- 3) Attempt any **Two** questions from Section - C.

Section - A

Q1)

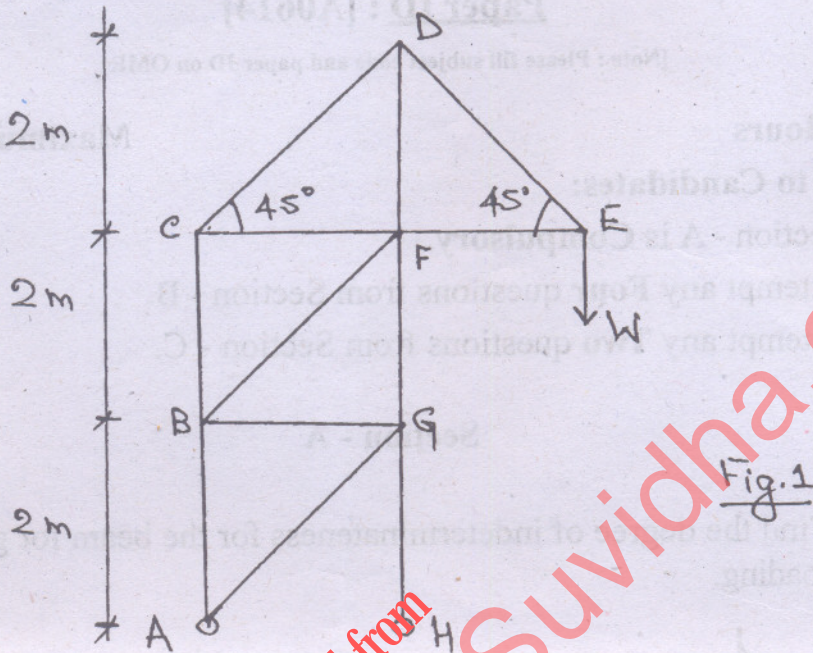
(10 × 2 = 20)

- a) Find the degree of indeterminateness for the beam for general case of loading.



- b) "In slope deflection method, joints are considered rigid". Comment.
- c) What is Distribution Factor?
- d) Show 2 types of substitute frames.
- e) Name 2 approximate methods for analysis of building frames subjected to lateral loads.
- f) "Kani's method is an extension of slope Deflection Method". Give your comments.
- g) Define Tension Coefficient.
- h) What is an Influence Line?
- i) Give two advantages of Fixed Beams.
- j) What is continuous beam? Which theorem is normally used to analyze Continuous Beams?

- Q2)** Determine the vertical deflection of the load in the structure shown in Figure 1. The tension members are stressed to 150 N/mm^2 and compression members to 80 N/mm^2 . All inclined members are at 45° with the horizontal. Take $E = 2.1 \times 10^5 \text{ N/mm}^2$.



- Q3)** A fixed beam of span 6m carries point loads of 200 kN and 150 kN at distances 2m and 4m from the left end. Find the fixed end moments & the reactions at the supports. Draw S.F. & B.M. diagrams.

- Q4)** Analyse the two-storeyed three bay frame shown in Fig 2 by Portal Method and determine the bending moments, shear forces and axial forces in various frame elements. Also draw the B.M. Diagram.

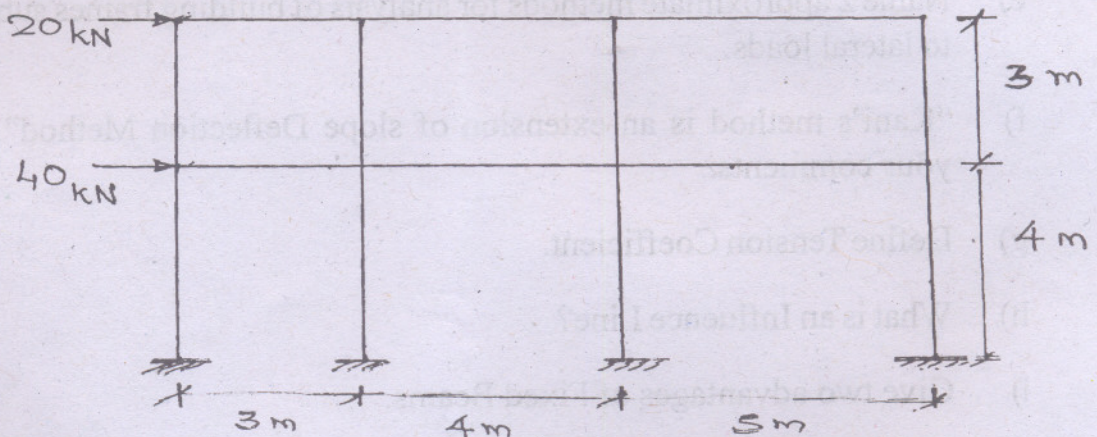


Figure 2

Q5) Determine forces in the bars of space frame shown in Figure 3. Use Tension Coefficient Method.

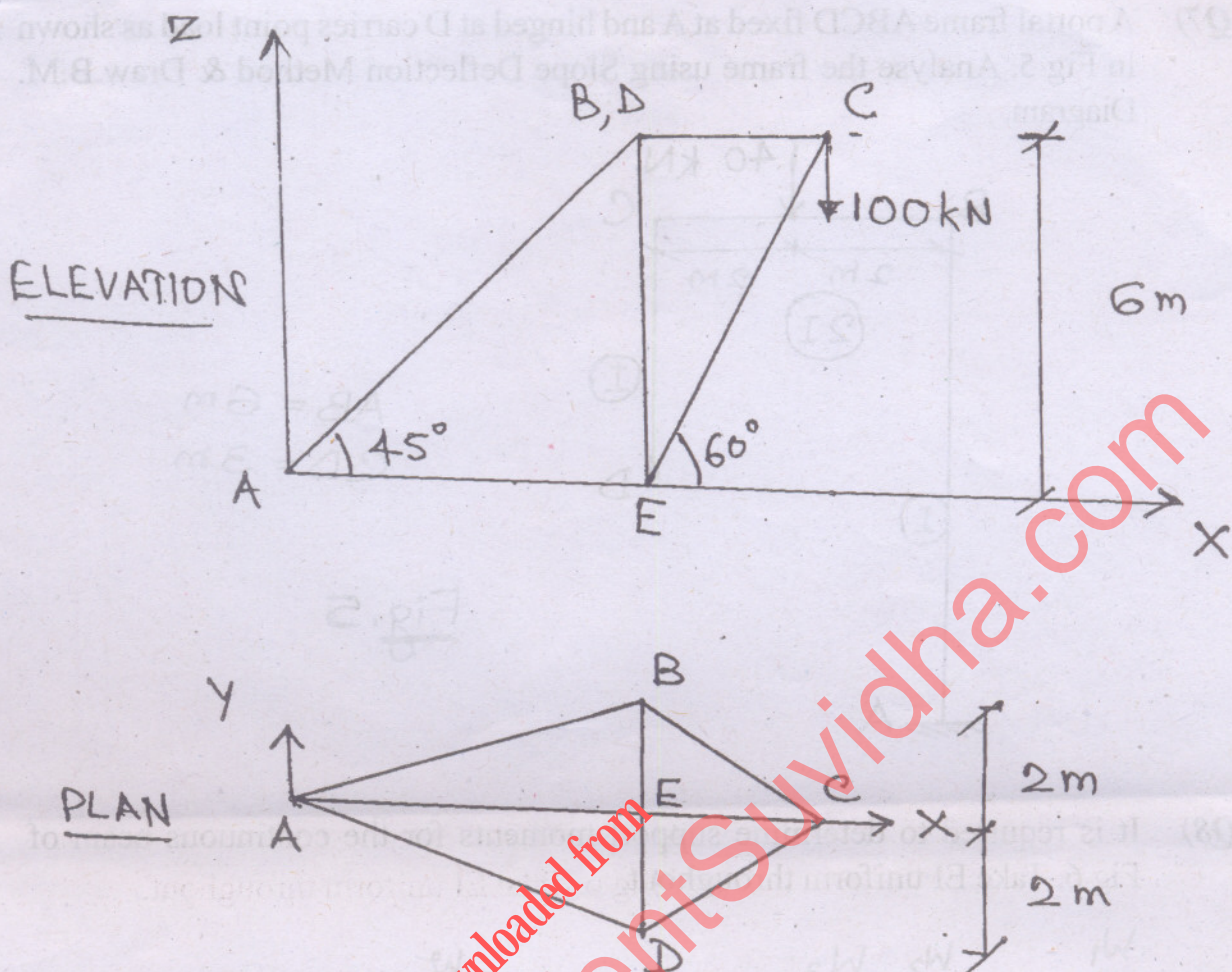


Figure 3

Q6) Draw influence lines for vertical reaction and B.M. at B in case of overhanging beam shown in Fig 4.

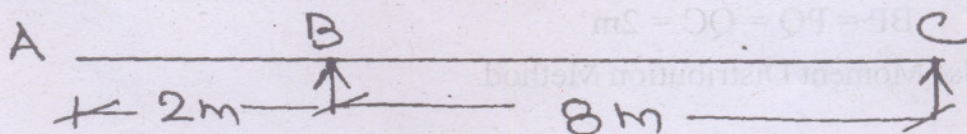
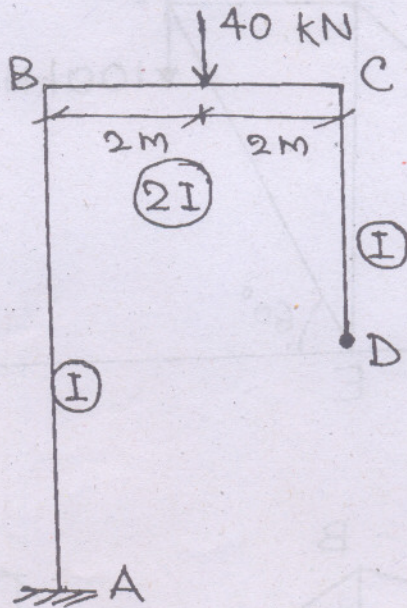


Fig. 4

- Q7) A portal frame ABCD fixed at A and hinged at D carries point load as shown in Fig 5. Analyse the frame using Slope Deflection Method & Draw B.M. Diagram.



$$AB = 6\text{ m}$$

$$CD = 3\text{ m}$$

Fig. 5

- Q8) It is required to determine support moments for the continuous beam of Fig 6. Take EI uniform throughout.

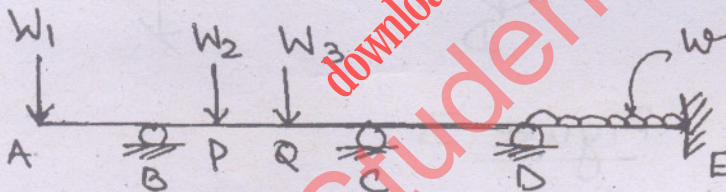


Fig. 6

$$AB = 3\text{ m}, BC = 6\text{ m}, CD = 4\text{ m}, DE = 4\text{ m}$$

$$W_1 = 50\text{ kN}, W_2 = W_3 = 80\text{ kN}, W = 40\text{ kN/m}$$

$$BP = PQ = QC = 2\text{ m}$$

Use Moment Distribution Method.

Q9) Analyse the frame shown in Fig 7 taking advantage of symmetry of frame & loading. Use Kani's Method.

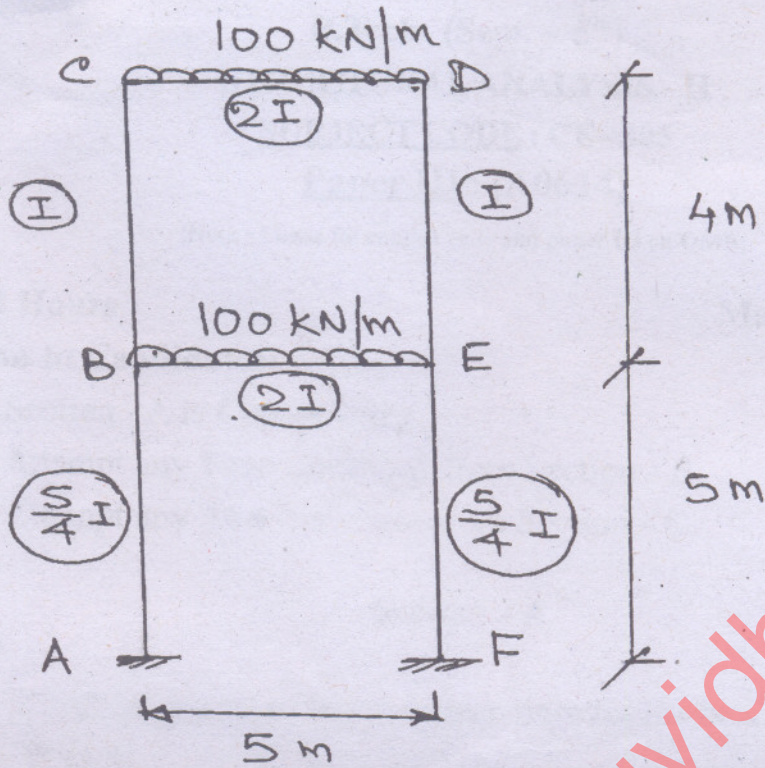


Fig. 7

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