

[6402]-9

S.E. (Civil)

STRUCTURAL ANALYSIS

(2019 Pattern) (Semester - IV) (201011)

Time : 2½ Hours]

[Max. Marks : 70

Instructions to the candidates:

- 1) Answer Q.1 or Q.2, Q.3 or Q.4, Q.5 or Q.6, Q.7 or Q.8.
- 2) Neat diagram must be drawn wherever necessary.
- 3) Figures to the right indicate full marks.
- 4) Assume suitable data if necessary.
- 5) Use of electronic pocket calculator is allowed.
- 6) Use of cell phone is prohibited in the examination hall.

Q1) a) Analyze the continuous beam by slope deflection method as shown in Fig. 1a. [8]

b) Analyze the portal frame by slope deflection method as shown in Fig. 1 b. [10]

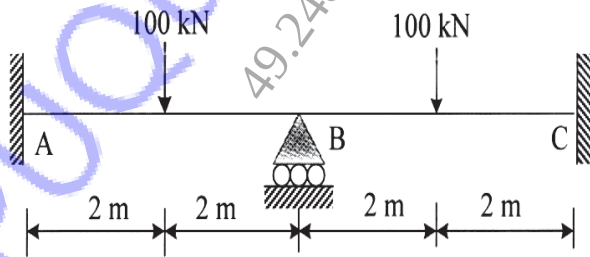


Fig. 1 a

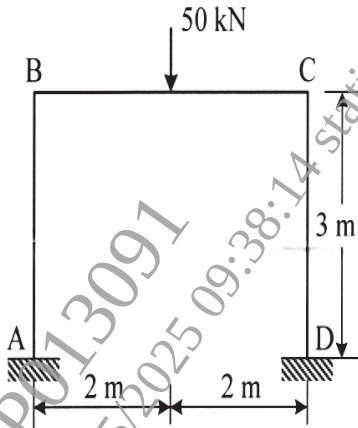
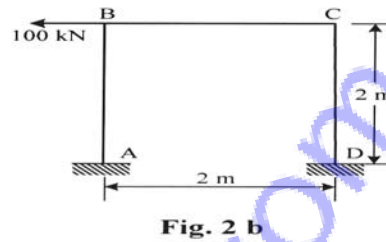
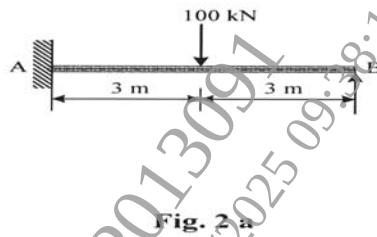


Fig. 1 b

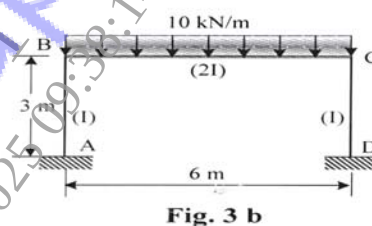
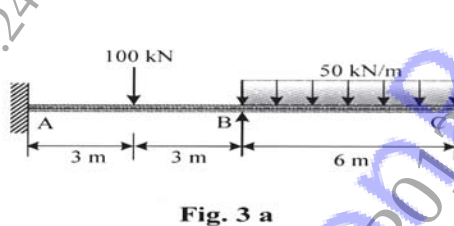
OR

P.T.O.

- Q2) a)** Analyze the propped cantilever by slope deflection method as shown in Fig. 2 a. [8]  
**b)** Analyze the portal frame by slope deflection method as shown in Fig. 2 b. [10]

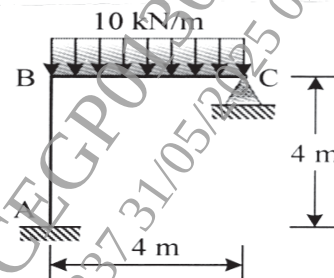
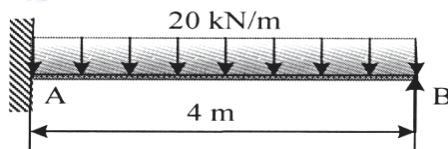


- Q3) a)** Analyze the continuous beam by moment distribution method as shown in Fig.3 a. [8]  
**b)** Analyze the portal frame by moment distribution as shown in Fig.3 b. [10]



OR

- Q4) a)** Analyze the propped cantilever by moment distribution method as shown in Fig.4 a and draw bending moment diagram. [8]  
**b)** Analyze the portal frame by moment distribution method as shown in Fig.4 b. [10]



- Q5) a)** Analyze the continuous beam by stiffness method as shown in Fig. 5 a. [12]  
**b)** Generate the stiffness matrix for the bent as shown in Fig. 5 b. [5]

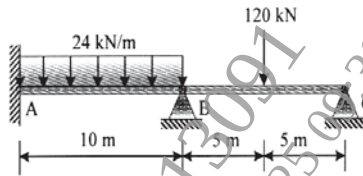


Fig. 5 a

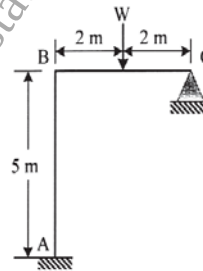


Fig. 5 b

OR

- Q6) a)** Analyze the frame by stiffness method as shown in Fig. 6 a. [12]  
**b)** Generate the stiffness matrix for the beam as shown in Fig. 6 b. [5]

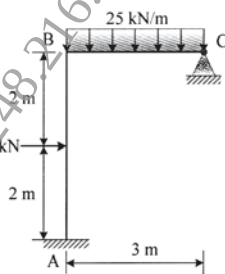


Fig. 6 a

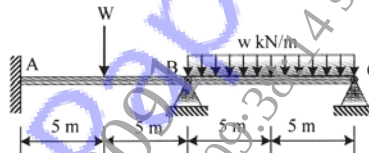


Fig. 6 b

- Q7) a)** State the assumption of plastic analysis. [5]  
**b)** Find the plastic moment for the beam loaded with ultimate loads as shown in Fig. 7 b. [12]

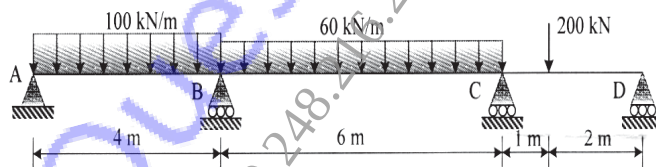


Fig. 7 b

OR

- Q8) a)** State and explain plastic collapse load, plastic moment and plastic section modulus. [5]  
**b)** A beam of T (Flange : 120mm × 12mm and web 168 mm × 12mm) cross-section is subjected to sagging moment, find the shape factor if permissible yield stress in compression and tension is 230 MPa and 280 MPa respectively. [12]

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