

D 2381

(Pages : 3)

Name.....

Reg. No.....

FIFTH SEMESTER B.TECH. (ENGINEERING) DEGREE EXAMINATION
DECEMBER 2009

Civil Engineering

CE 04 501—STRUCTURAL MECHANICS—II

(2004 admissions)

Time : Three Hours

Maximum : 100 Marks

Missing data, if any, may be assumed.

I. Answer all questions.

- What are the basic steps in the analysis of a continuous beam by slope deflection method ?
- How do you calculate the joint stiffness in moment distribution method ?
- How do you analyse a continuous beam with one end fixed using three moment equation ?
- Briefly explain the procedure for analysing beams by Kani's method.
- What is a substitute frame ? What are the concepts of this method of analysis ?
- Explain the portal method of analysis for lateral loads.
- What is torsion factor ?
- Define 'plastic hinge', 'plastic moment capacity'

(8 × 5 = 40 marks)

II. (a) Analyse the continuous beam shown in Fig. 1 by the slope deflection method. Draw the shearforce and bending moment diagram. EI is constant.

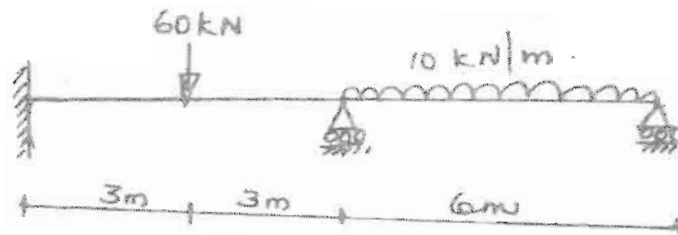


Fig. 1

Or

(b) Analyse the continuous beam shown in Fig. 2 by moment distribution method. EI is constant.

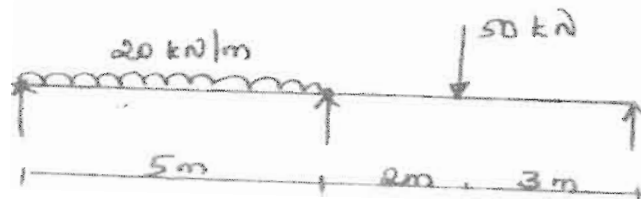


Fig. 2

(15 marks)

Turn over

III. (a) Analyse a three bay three storeyed frame with equal bay length of 4 m and storey height 3.2 m. The frames are placed at 4m intervals. Dead load is 3.5 kN/m^2 and live load is 5 kN/m^2 . Find the maximum moment in beam. EI constant.

Or

(b) Analyse the frame shown in Fig. 3 by cantilever method

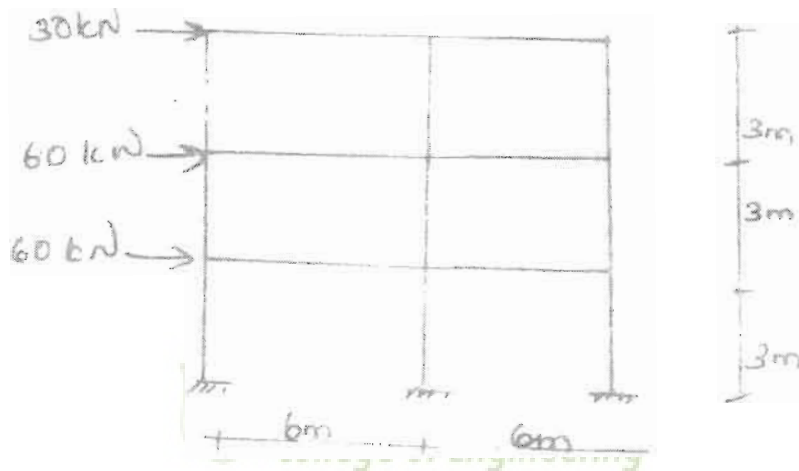


Fig.

(15 marks)

IV. (a) Analyse the continuous beam shown in Fig. 4 by applying the theorem of three moments and draw the bending moment diagram.



Fig 4

Or

- (b) Analyse the continuous beam shown in Fig. 5 by Kani's method. Sketch the bending moment diagram.

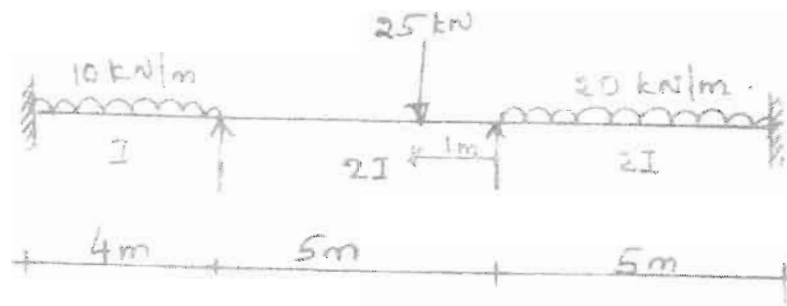


Fig. 5

(15 marks)

- V. 15) A quarter circle beam of radius R curved in plan is fixed at end A and free at end B. It carries a vertical load P at its free end. Determine the deflection at the free end and sketch the shear force, bending moment and torsional moment diagram. Assume flexural rigidity is equivalent to torsional rigidity.

Or

- (b) Determine the plastic moment capacity M_p for the frame shown in Fig. 6

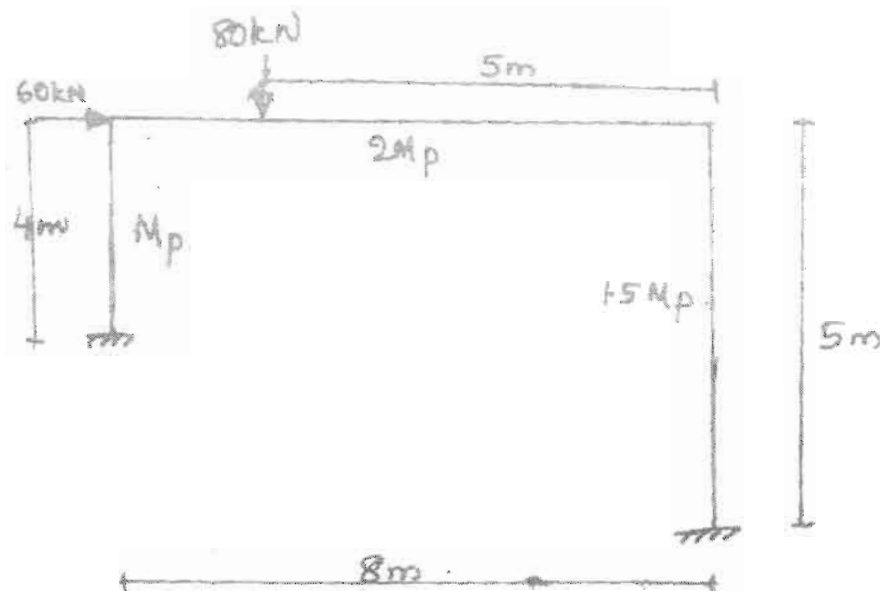


Fig. 6

(15 marks)

[4 × 15 = 60 marks]