D 90145 (Pages : 4) Name.....

Reg. No.....

FIFTH SEMESTER B.TECH. (ENGINEERING) [09 SCHEME] DEGREE EXAMINATION, NOVEMBER 2015

CE/PTCE 09 505—STRUCTURAL ANALYSIS—II

Time : Three Hours Maximum : 70 Marks

Part A

Answer **all** *questions.*

1. Define degree of indeterminacy with an example.
2. List out the types of supports.
3. Define the term 'Compatability'.
4. Explain the term 'flexibility Co-efficient'.
5. Name any *two* methods of horizontal load analysis for multistory frames.

(5 × 2 = 10 marks)

Part B

Answer any **four** *questions.*

1. Define clapeyron's Theorem.
2. Draw loading patterns for substitute frame analysis for Max. B.M.
3. What is the difference between elastic theory and plastic theory of design ?
4. A beam of rectangular cross-section is subjected to a B.M. of 0.75 Mp. Find out the depth of the elastic core.
5. Draw neat sketches of substitute frames for maximum B.M. Conditions.
6. Compare different methods of analysis of structures.

(4 × 5 = 20 marks)

Part C

1. Show that the slope-deflection equations for the members shown in figure - 1 (shown on 2nd page), are,

$$M_{AB} = \frac{16EI}{11L}\left[3\theta_A + 2\theta_B - \frac{5\delta}{L}\right] \text{ and } M_{BA} = \frac{16EI}{11L}\left[2\theta_A + 5\theta_B - \frac{7\delta}{L}\right].$$

Turn over

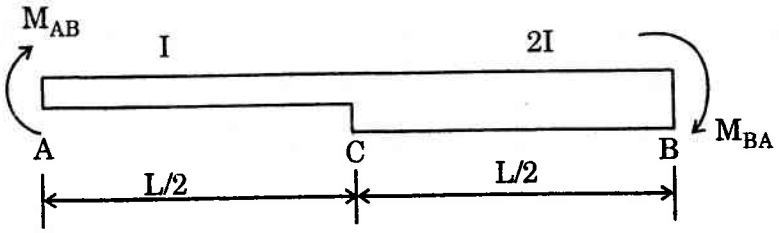


Fig. 1

Or

2. A continuous beam ABC is shown in figure - 2. Calculate the moments induced at ends if support B settle by 30 mm. Draw the BMD and the deflected shape of the beam. Take $E = 2 \times 10^5$ N/mm^2. and $I = 3 \times 10^6$ mm^4.

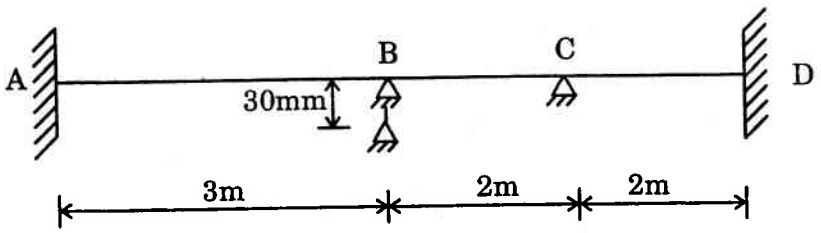


Fig. 2

3. Draw the BMD and sketch the deflected shape of the frame as shown in figure - 3. The ends A and D are fixed and BC is loaded with u.d.l. of 6 kN/m.

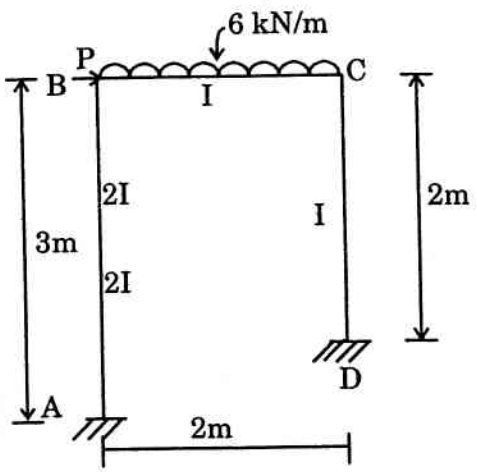


Fig. 3

Or

4. Using Kani's method of analysis, solve the problem shown in figure 4.

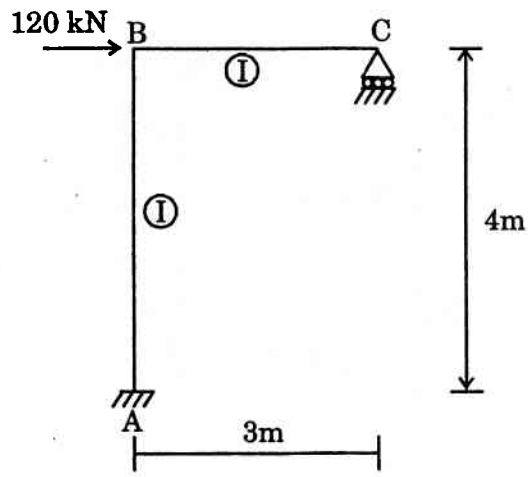


Fig. 4

5. Explain the following :—
   (a) Rotation factors.
   (b) Linear displacement factor.
   (c) Restraint moments.
   (d) Storey moment.

Or

6. Analyse the structure and draw BMD and SFD using Kani's method along with the deflected shape for the figure - 5.

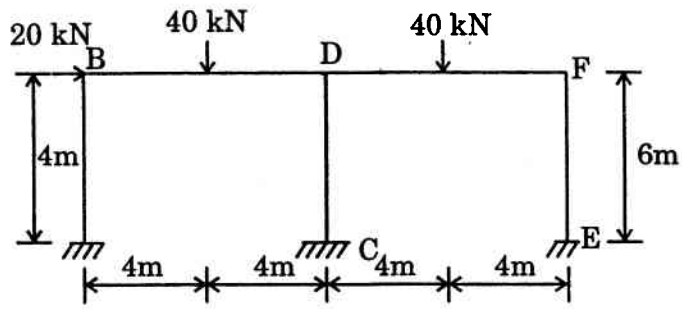
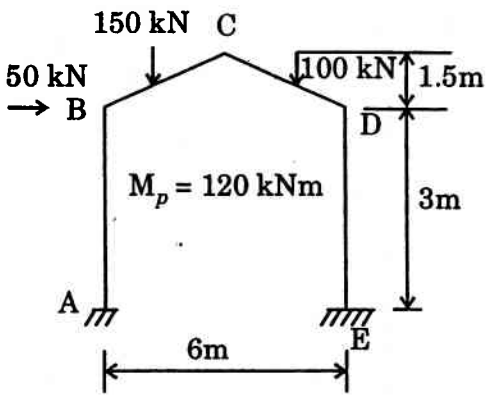


Fig. 5

7. Calculate the collapse load factor for the gable frame as shown in figure - 6. Sketch the BMD at ultimate load.



Or

8. Explain elaborately the methods of analysis for horizontal loads for a multistorey building frame with examples.

(4 × 10 = 40 marks)