Total No. of Questions : 12]

SEAT No. :

P2378

[Total No. of Pages :5

[5153]-1

T.E. (Civil)

STRUCTURAL ANALYSIS - II

(2008 Course) (Semester - I)

Time : 3 Hours] *[Max. Marks :100*

Instructions to the candidates:

1) ***Answers to the two Sections should be written in separate books.***
2) ***Neat diagrams must be drawn wherever necessary.***
3) ***Figures to the right indicate full marks.***
4) ***Use of electronic pocket calculator is allowed.***
5) ***Assume suitable data, if necessary.***
6) ***Attempt Q. 1 or Q.2, Q.3 or Q. 4, Q.5 or Q.6 from Section - I and Q.7 or Q.8, Q.9 or Q.10, Q.11or Q.12 from Section - II.***

SECTION - I

Q1) a) Using Slope Deflection method, determine the support moments and hence Plot the BMD on tension side for the beam ABC if beam is loaded and Supported as narrated below.

Support A is fixed and support B and C are vertical roller.

Span AB = 3m, Span BC = 6m. Downward udl on span AB = 50 kN/m, Downward Concentrated load of 100 kN at the centre of span BC. EI = constant for span AB and BC. **[10]**

b) Analyze the continuous beam loaded and supported as shown in figure 1 (b) by slope - deflection method. The relative moment of Inertia values of all spans are indicated on the beam. Draw bending moment diagram.**[8]**

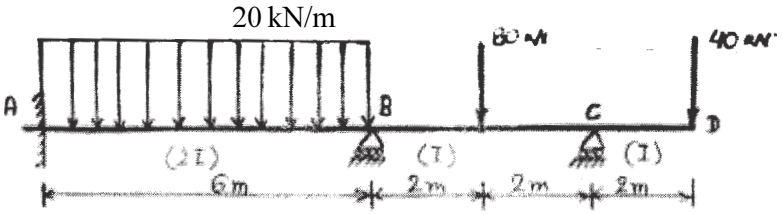


Fig. 1(b)

OR

P.T.O.

Q2) a) A continuous beam ABC consist of span AB=3m & BC = 4m, The ends A & C being fixed. AB & BC carry udl of intensity 4kN/m & 5kN/m. Respectively. Find support moments & draw BMD for the beam. The beam is of Uniform section throughout. By using slope deflection method. **[9]**

b) Analyze the continuous beam as shown in fig. by slope deflection method and draw SFD and BMD Refer Fig. 2 (b). **[9]**

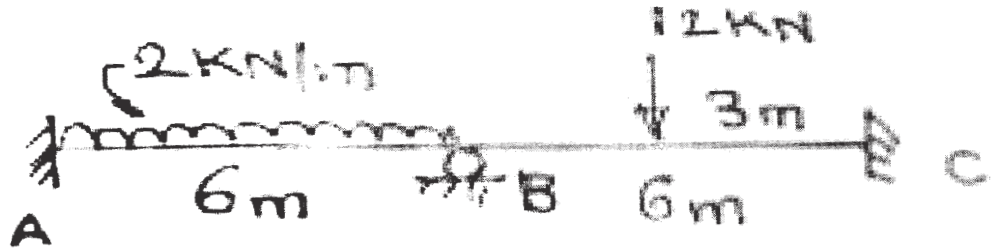


Fig. 2 (b)

Q3) a) Analyse the beam shown in Fig. 2 (b) by Moment Distribution Method. Draw BMD and SFD. **[8]**

b) Analyse the frame shown in Fig. 3 (b) by MDM. Draw BMD. **[8]**

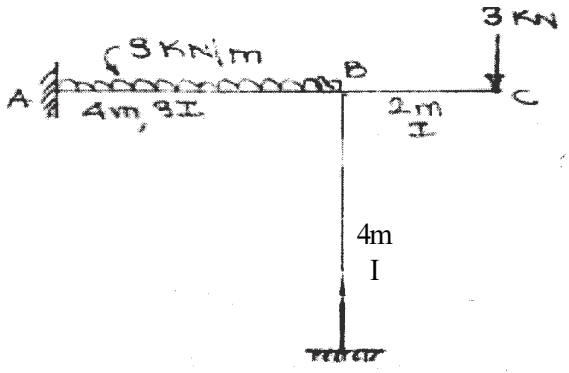


Fig. 3(b)

OR

Q4) a) Draw BMD for the beam shown in fig. 4 (a) by using Moment Distribution Method. **[8]**

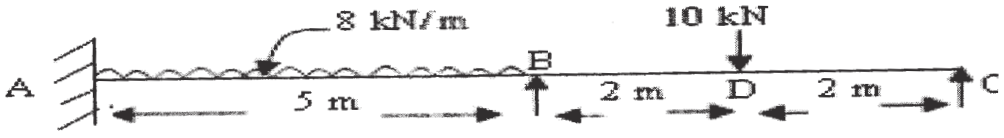


Fig. 4(a)

b) Analyze the frame shown in Fig. 4 (b) by MDM. Draw BMD. **[8]**

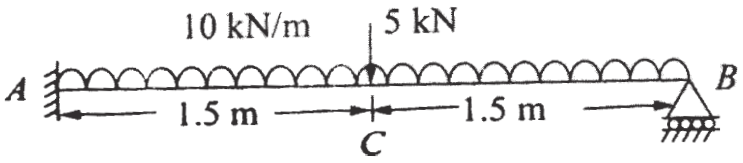


Fig. 4 (b)

Q5) a) A three hinge circular arch hinged at springing and crown point has a span of 30m and a central rise of 8m. It carries uniformly distributed load of 20KN/m over the left half of the span with a concentrated load of 150 KN at right quarter span point. Find the reactions at supports, normal thrust and shear at a section 5m from the left support. **[8]**

b) A two hinged parabolic arch of span 'L' and rise 'h' carries a concentrated Load 'W' at the crown. Determine the expression for horizontal thrust Developed at springing. **[8]**

OR

Q6) a) Plot BMD for three hinged parabolic arch, hinged at crown and at the Springing level. Arch has horizontal span, 30m, central rise, 5m and carries udl, 50 kN/m over the left half span. **[8]**

b) A two hinged parabolic arch of span 20 m, rise 4m and carries the udl of 50 kN/m over the length of 5m from left support A. Determine the horizontal thrust. **[8]**

SECTION - II

Q7) a) Using Flexibility Matrix Method, determine the reactions for the continuous beam ABC subjected to downward point load, 50kN at the center of span AB and clockwise moment, 100kN-m at the center of span BC. Span AB=half of Span BC = 6m. Assume constant EI for ABC. **[12]**

b) Explain concept of Flexibility matrix. **[4]**

OR

Q8) a) Analyze the beam as shown in fig. 8 (a) by Flexibility Matrix Method. Draw B.M.D. Take EI = constant. **[8]**

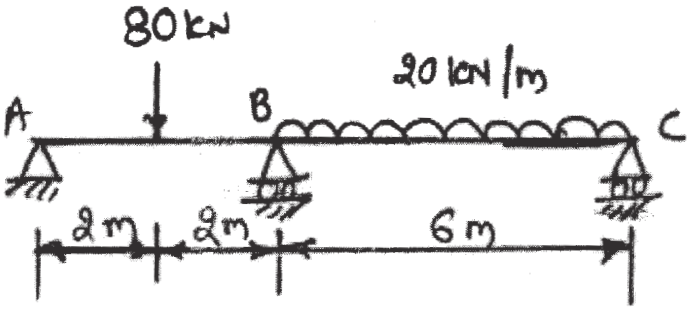


Fig. 8(a)

b) A Propped cantilever beam of span 6m is subjected to udl 100 kN/m over full Span using Flexibility Matrix Method, Analysis the beam and plot SFD & BMD. **[8]**

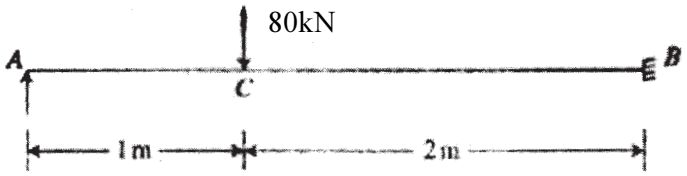
Q9) a) List out the property of stiffness matrix method. **[4]**

b) A continuous beam ABCD, fix at A and D and continuous over support B and C. Span AB = BC = CD = 4 meter each span is subjected to UDL of 15 KN/m, 20KN/m 4 KN/m respectively. Analyze the beam by Stiffness Matrix method and draw SFD and BMD. **[12]**

OR

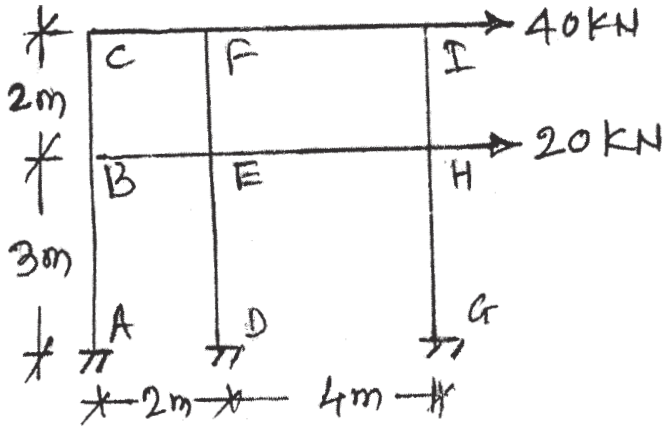
Q10)a) Analyze the beam as shown in fig. 8(a) by Stiffness method. Draw B.M.D. Take EI = constant. **[8]**

b) Using stiffness matrix method find the end moments at A and B for the given beam. **[8]**



Q11)a) A beam supported at both ends having span 8m. The beam carries Uniformly distributed load of 10KN/m over its entire span. Determine the central deflection in terms of its EI. Use finite difference method. Use Five nodes. **[6]**

b) A rigid jointed 2 bay - 2 story frames is shown in the fig 11 (b). Using Cantilever method, determine support reactions and moments. Area of Column. ABC = A and Area of column DEF & GHI = 2A. **[12]**



OR

Q12)a) The beam is supported and loaded an shown in fig. Q.12 (a). Determine the Deflection in terms of its EI under the load. Use finite difference method. Use five nodes. **[6]**

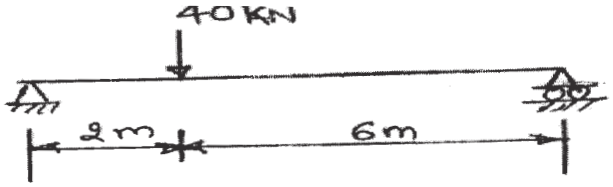


Fig 12(a)

b) Determine the approximate values of moment, shear, and axial force in each Member of frame loaded and supported as shown in fig. Q. 12 (b). Draw B.M.D. Use portal method. **[12]**

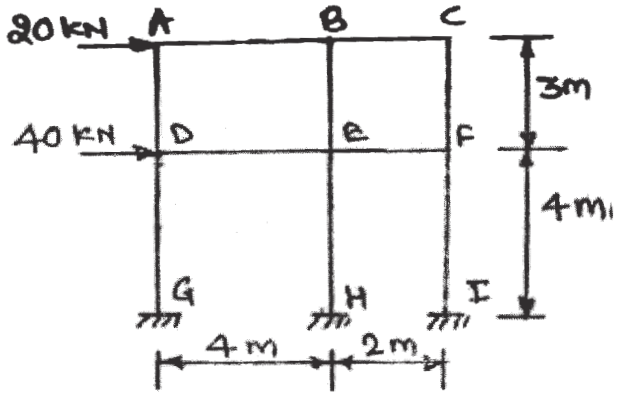


Fig 12(b)