

**Fifth Semester B.E. Degree Examination, July/August 2022**  
**Structural Analysis – II**

Time: 3 hrs.

Max. Marks: 100

**Note:** 1. Answer any FIVE full questions, selecting at least TWO questions from each part.  
 2. Missing data, if any may suitably be assumed.

**PART – A**

- 1 a. What is an influence line? Explain its importance in structural analysis. (06 Marks)  
 b. A series of wheel loads of 60 kN, 70 kN, 120 kN and 50 kN spaced at 2 mt, 3 mt and 2 mt crosses over a simply supported Girder of span 20 mt from Left to Right with 60 kN load leading as shown in Fig. Q1 (b). Determine  
 (i) Maximum B.M. and S.F. at 6 mt from the left support.  
 (ii) Maximum B.M under 70 kN load. (14 Marks)

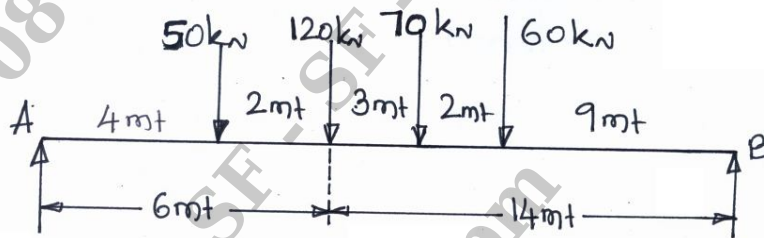


Fig. Q1 (b)

- 2 Analyze the continuous beam shown in Fig. Q2 by using slope deflection method, if the supports A and D are fixed. Draw BMD and SFD and elastic curve. (20 Marks)

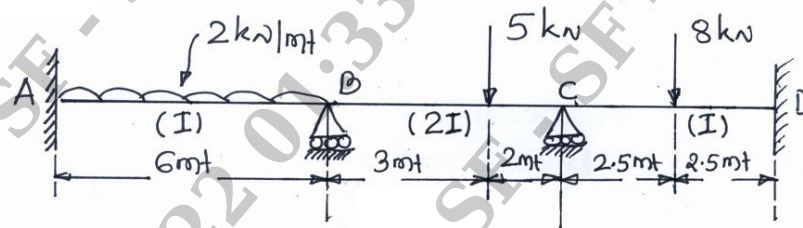
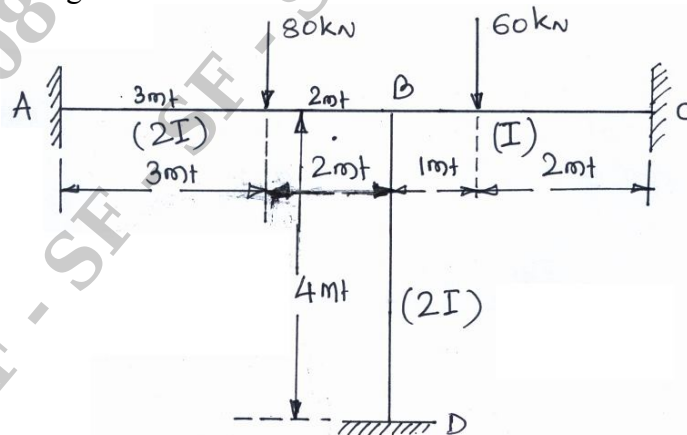


Fig. Q2.

- 3 Analyze the given frame shown in Fig. Q3 by using moment distribution method and draw the bending moment diagram. (20 Marks)

Fig. Q3  
1 of 2

- 4 Analyze the portal frame shown in Fig. Q4 by using moment distribution method and draw the BMD. (20 Marks)

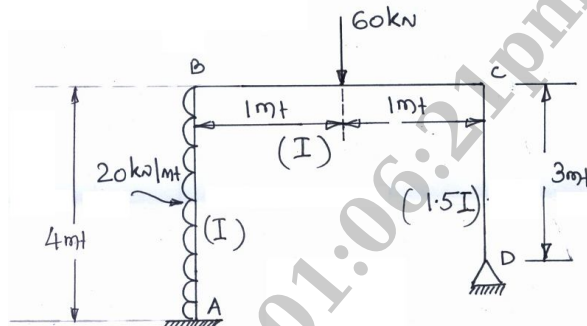


Fig. Q4

**PART – B**

- 5 Analyze the Beam shown in Fig. Q5 by using Kani's method and draw the bending moment diagram. (20 Marks)

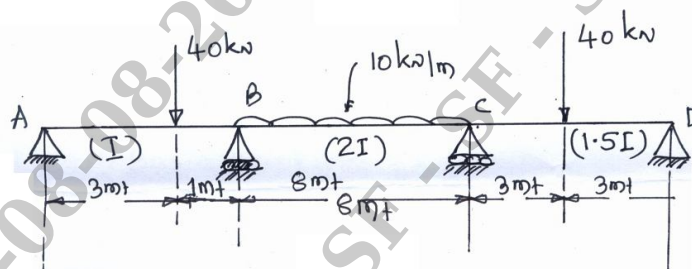


Fig. Q5

- 6 Analyze the beam shown in Fig. Q6 by flexibility method and draw BMD. (20 Marks)

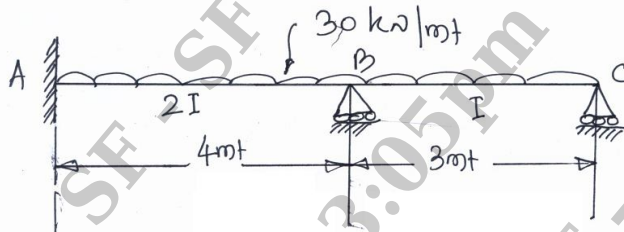


Fig. Q6

- 7 Using the stiffness method of analysis and obtain the moments at the ends of member for the portal frame shown in Fig. Q7 and also draw BMD. (20 Marks)

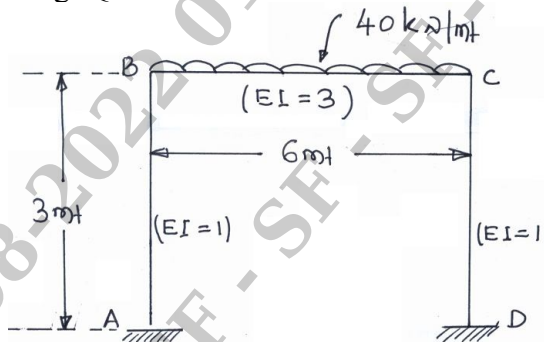


Fig. Q7

- 8 a. Define the following :  
 (i) Natural frequency. (ii) Degrees of freedom.  
 (iii) Damping. (iv) Basic principles of dynamics. (12 Marks)
- b. A mass of 0.01 kN is attached to a spring of stiffness 0.7 kN/mm. Determine the natural frequency and co-efficient of critical damping. (08 Marks)

\*\*\*\*\*