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UNIVERSITY OF PETROLEUM AND ENERGY STUDIES

End Semester Examination, December 2017

Program: B. Tech (Civil)

Subject (Course): Structural Analysis II

Course Code : CIVL 3003

No. of page/s: 3

Semester – V

Max. Marks : 100

Duration : 3 Hrs

Paper: I

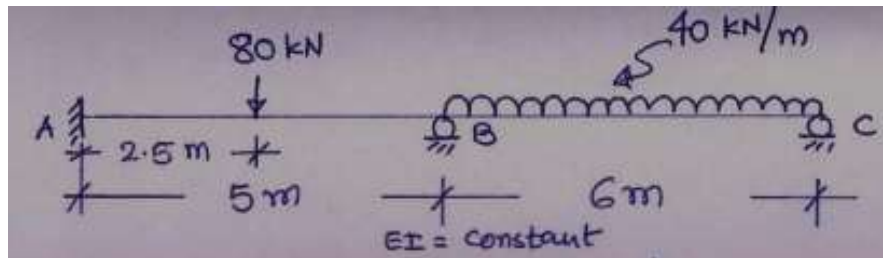
NOTE: Answer all questions from Part-A. Answer all questions from Part-B. Answer both questions from part-C. **Missing data should be suitably assumed & mention clearly**

PART – A

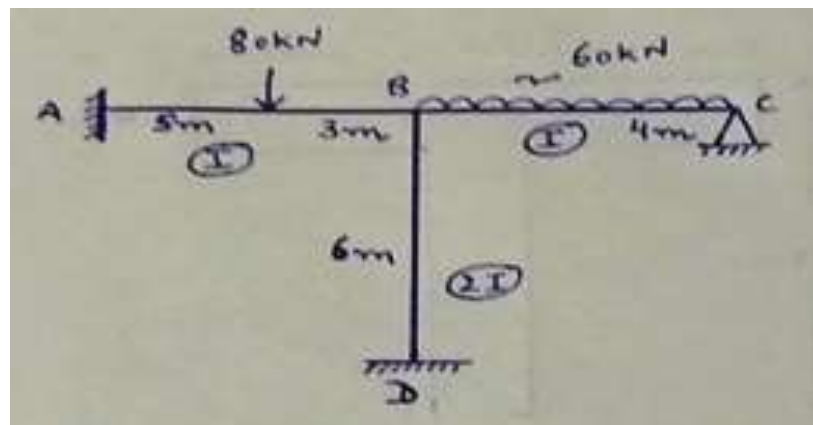
- Q.1 Explain Muller Breslau principle with a suitable example 4 Marks CO2
Q.2 Differentiate between flexibility & stiffness matrix. 4 Marks CO3
Q.3 Explain (i) Shape Factor (ii) Plastic Hinge 4 Marks CO4
Q.4 In a fixed beam of length L, if one end sinks by δ , what are moments & reactions induced at both ends? 4 Marks CO2
Q.5 Write difference between portal & cantilever method of multistoried frames. 4 Marks CO2

PART – B

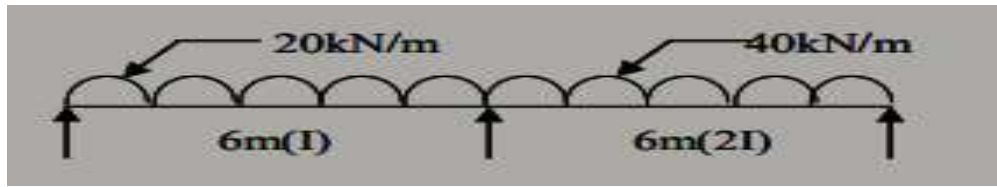
- Q.6 Analyze the Continuous beam shown in figure below by **Flexibility method**. Draw B.M.D & S.F.D for the Same. 10 Marks CO3



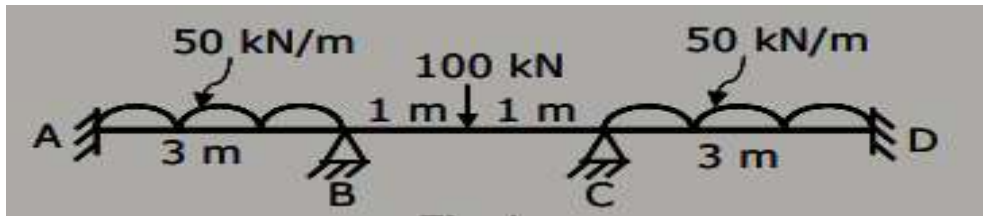
- Q.7 Analyze the frame shown in figure below by **Stiffness method**. Draw B.M.D & S.F.D for the same. 10 Marks CO3



Q.8 Analyze the beam shown in figure below by **Slope deflection method**. Draw B.M.D & S.F.D. The mid support B settles by 8mm. 10 Marks CO2

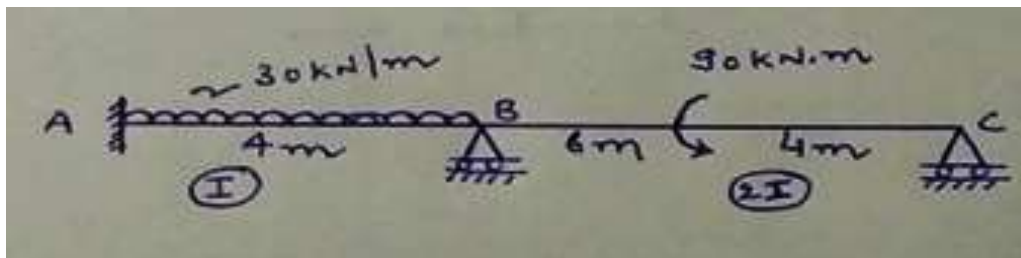


Q.9 Analyze the beam shown in figure below by **Moment distribution method**. Draw B.M.D & S.F.D for the same. 10 Marks CO2



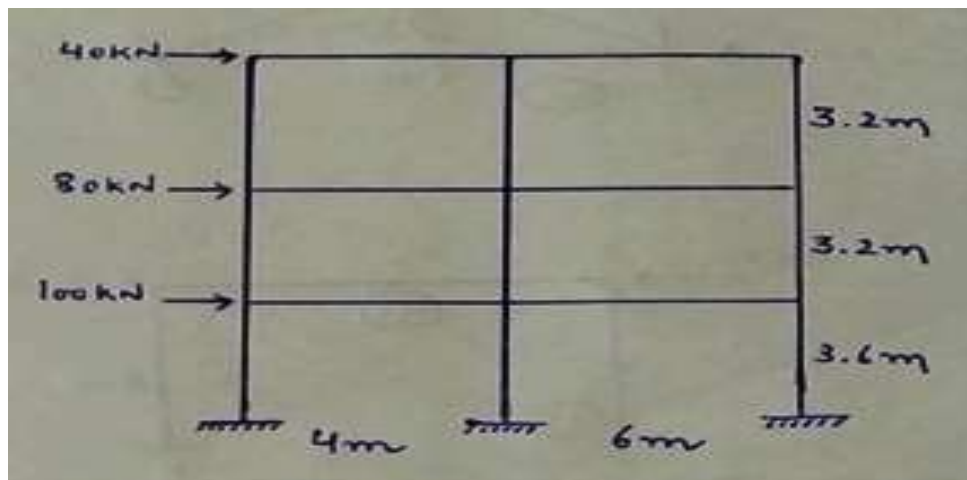
OR

Q.10 Analyze the beam shown in figure below by **Consistent Deformation method**. Draw B.M.D & S.F.D for the same. Take M_A & M_B as redundant. 10 Marks CO1 & CO2



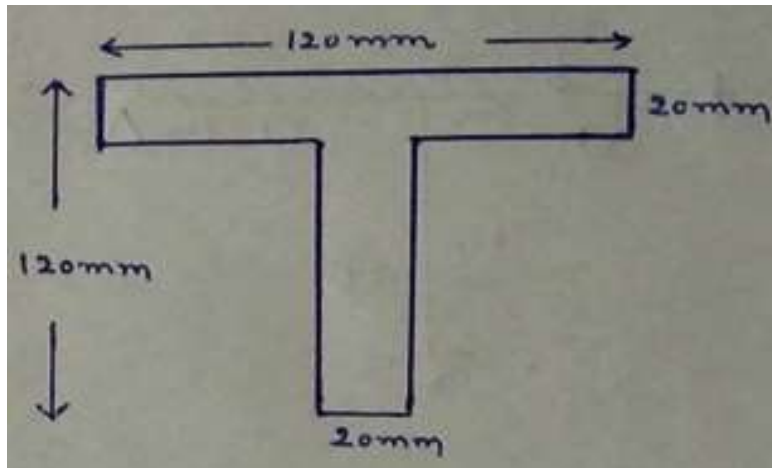
PART - C

Q.11 Analyze the frame shown in figure below by **Cantilever method**. 20 Marks CO2



Q.12 Determine the **Shape factor** for the “T” Beam section shown in figure below. 20 Marks

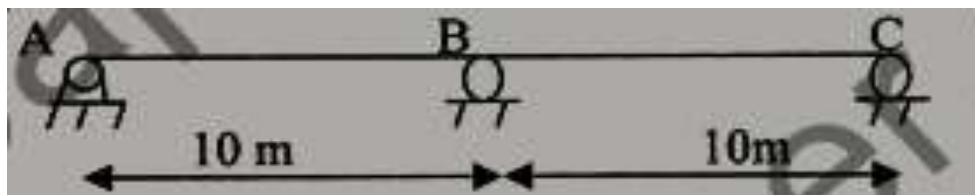
CO4



OR

Q.13 Determine the Influence line diagram for **Bending Moment** at mid span of AB for the continuous beam shown in figure below by **Muller Breslau principle** & determine the ordinate at 2m interval

20 marks CO1 CO2



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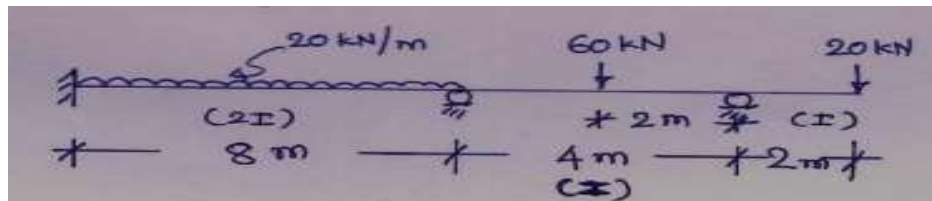
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PART – A

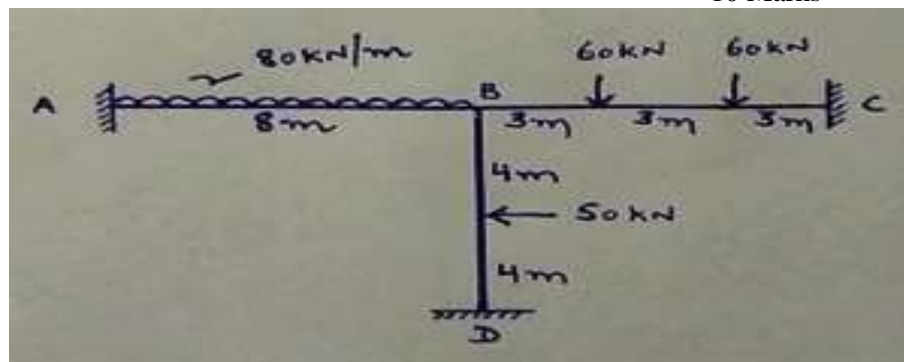
- Q.1 what is Influence line diagram. Explain its importance in structural analysis. 4 Marks CO1
- Q.2 Define the terms with neat sketches. (i) Stiffness (ii) Relative stiffness 4 Marks CO2
- Q.3 State the advantage of fixed beams over simply supported beam. 4 Marks CO2
- Q.4 How sway correction factor is found for analysis of portal frame by Moment distribution method? 4 Marks CO2
- Q.5 Prove that flexibility matrix is inverse of stiffness matrix 4 Marks CO3

PART – B

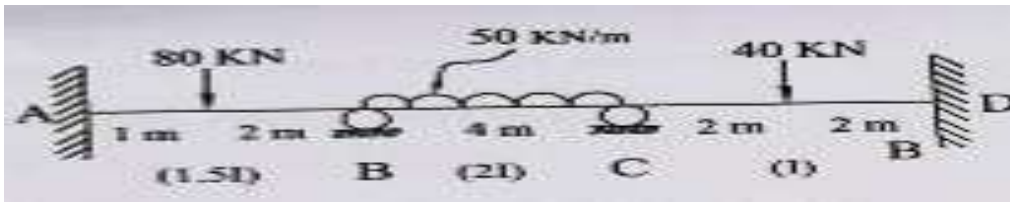
- Q.6 Analyze the Continuous beam shown in figure below by **Flexibility method**. Draw B.M.D & S.F.D for the Same. 10 Marks CO3



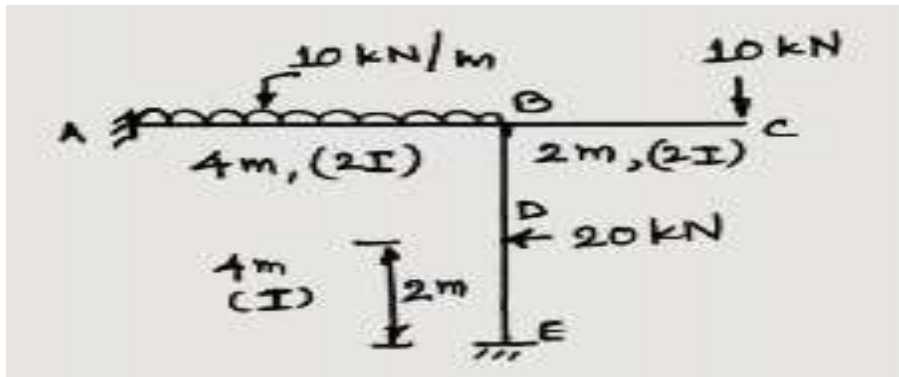
- Q.7 Analyze the frame shown in figure below by **Stiffness method**. Draw B.M.D & S.F.D for the same. 10 Marks CO3



Q.8 Analyze the beam shown in figure below by **Slope deflection method**. Draw B.M.D & S.F.D. The support B & C settles by 8mm & 3mm. 10 Marks CO2

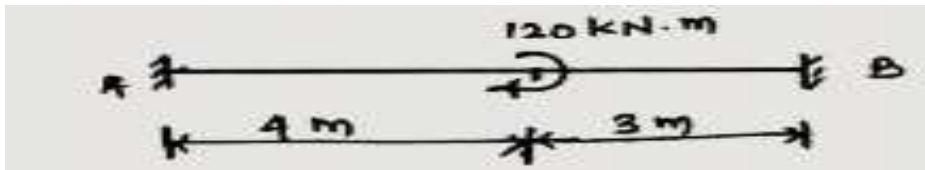


Q.9 Analyze the frame shown in figure below by **Moment distribution method**. Draw B.M.D for the same. 10 Marks CO2



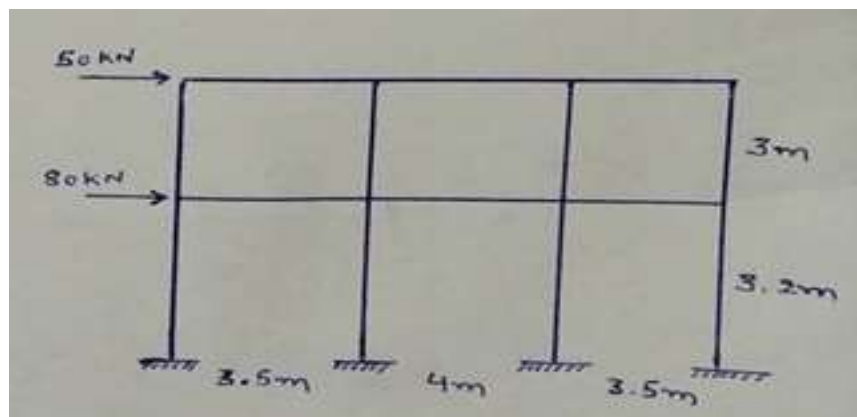
OR

Q.10 Analyze the beam shown in figure below by **Consistent Deformation method**. Draw B.M.D & S.F.D for the same. Take M_A & M_B as redundant. 10 Marks CO1 & CO2



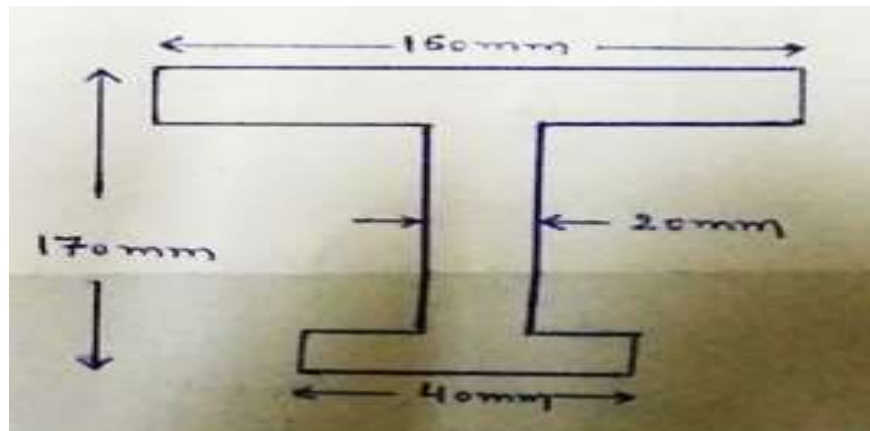
PART - C

Q.11 Analyze the frame shown in figure below by **Portal method**. 20 Marks CO2



Q.12 Determine the **Shape factor** for the “I” Beam section shown in figure below. 20 Marks

CO4



OR

Q.13 Determine the Influence line diagram for **Shear force** at mid span of AB for the continuous beam shown in figure below by **Muller Breslau principle** & determine the ordinate at 2m interval. 20 marks

CO1 & CO2

