Code No: R1622015 **R16** SET - 1

II B. Tech II Semester Supplementary Examinations, April - 2021
STRUCTURAL ANALYSIS-I
(Civil Engineering)

Time: 3 hours Max. Marks: 70

Note: 1. Question Paper consists of two parts (**Part-A** and **Part-B)**
2. Answer **ALL** the question in **Part-A**
3. Answer any **FOUR** Questions from **Part-B**

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PART –A

1. a) Draw the bending moment diagram for a propped cantilever of length l with u.d.l. over the whole span.
   b) Draw the shear force and bending moment diagrams for a fixed beam when one of its supports sinks.
   c) State and deduce the Clapreyon's three-moment equation.
   d) Write the expression MBA in terms of fixed moments, slopes θA, θB and settlement Δ.
   e) Derive the expression for strain energy of a straight prismatic bar of length L and cross-sectional area A, if it is subjected to an axial force, F.
   f) Draw Influence line diagrams for a Pratt truss.

PART -B

2. a) Determine the reactions of the propped cantilever beam and draw SFD and BMD.

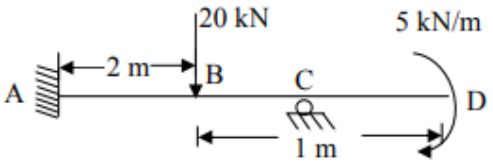

Figure 1

   b) Find the support moment for the propped cantilever carrying uniformly varying load w/unit length from A to B. Draw B.M.D.

3. Analyse the fixed beam shown in the Figure 1.

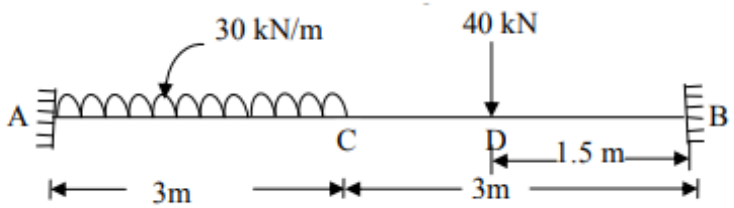

Figure 1

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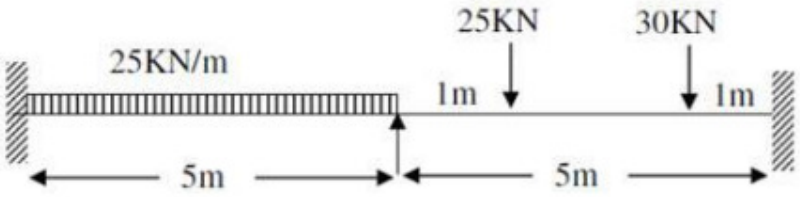
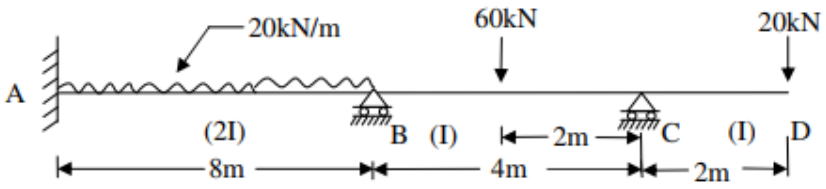
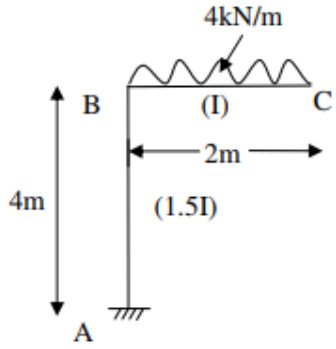
4. Solve the continuous beam in below figure by using theorem of three moments.



5. Analyse the beam ABCD shown in figure by Slope-Deflection method and draw bending moment diagram.



6. Determine the horizontal and vertical component of deflection at the Point 'C' of the frame shown in figure. Take E=200x10^3 N/mm^2 and I =6x10^7 mm^4 . Use Strain Energy method.



7. Draw the Influence line diagram for reactions of a simply supported beam of 12 m span. Also draw the influence line diagrams for Shear force and bending moments at quarter span and mid-span sections.