0Mid-West University

Examinations Management Office

End Semester Examinations-2080

Master level/Structural Engineering /1st Semester

Time: 3 hours

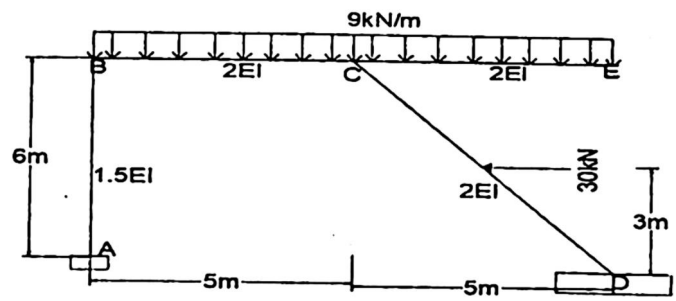
Full Marks: 60

Pass Marks: 30

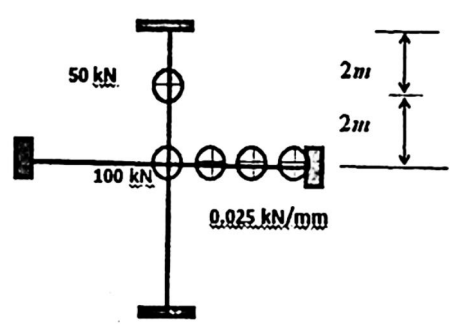
Subject: Advanced Structural Analysis (STR511/MSTR501)

- *Attempt all the questions*
- *Figures in the margin indicate full marks.*
- *Assume suitable values, with a stipulation, if necessary.*
- *Candidates are required to answer the questions in their own words as far as possible.*

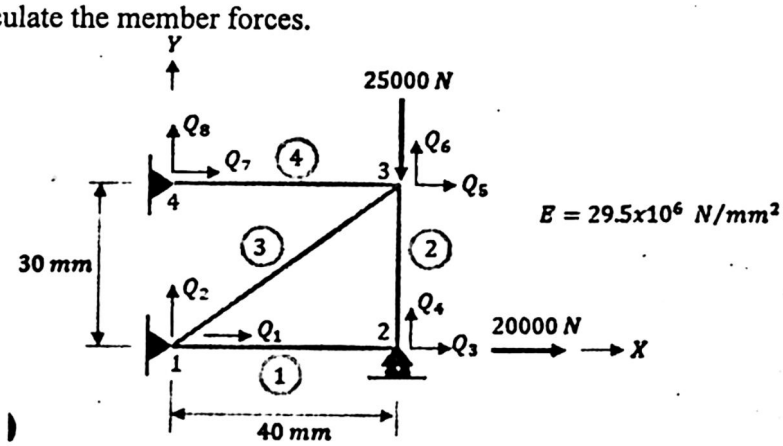
1. Create Stiffness matrix of the following Frame and draw bending moment diagram using Displacement method. **[12]**



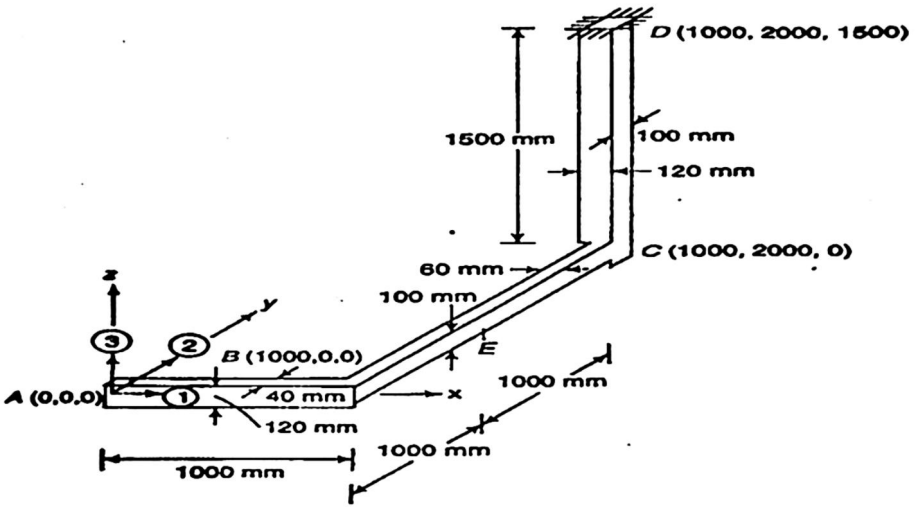
2. Create stiffness matrix for unit displacements and load displacements following grid structure symmetric in geometry. A horizontal member section is 300x500mm. Take E= 200 GPa and G=150GPa. Tale all members are 4m in length **[10]**



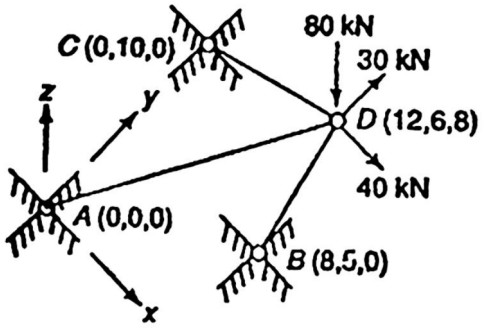
3. A truss system consisting of four bar elements is shown below. The modulus of elasticity of all the elements in this truss system is E= 29.5 × 106 N/mm2. The cross-sectional areas are given as A1 = 0.8mm2, A2 =1 mm2, A3 = 1.2 mm2 and A4 = 1.1 mm2.. Developed sriffness matrix and calculate the member forces. **[12]**



Cranked bar shown in figure below it hinged at point A and fixed at Point D it carries the uniform distributed vertical load of 2kN/m on member AB and vertical load of 1kN on member BC at its Centre E. Compute the Reaction at Support A. [12]



5. Using Tension coefficient method calculate the member forces of the pin jointed space truss as shown figure below. [8]



6. Write the short Notes on any Two 2x3=6 [6]
   a) Sky line and Band width matrix approach
   b) Analysis of symmetry and skew symmetry Structure
   c) Ritch approach of Beam analysis with Shear stress.

THE END