Registration No: | | | | | | | | | | **M.TECH**

Total Number of Pages : 2

M.TECH 1ST SEMESTER REGULAR EXAMINATIONS, DECEMBER 2018
MATRIX METHODS OF ANALYSIS OF STRUCTURES
Branch: SE, Subject Code:MSEPC1030
(Regulations 2018)

Time: 3 Hours   **Max Marks : 70**   Question Code: RD18002053

PART-A (10 X 2=20 Marks)

1. Answer the following questions.

     a. Stiffness matrix is always symmetric. Comment.
     b. What is the static indeterminacy of a fixed beam with a concentrated transverse?
     c. What is the advantage of matrix analysis over classical methods of structural analysis?
     d. To get a correct solution to a structural problem ,what are the conditions to be satisfied throughout the structure.
     e. Differentiate between displacement and deformation.
     f. What do you mean by Castiglione's theorem?
     g. How are the structures classified?
     h. What is the kinematic indeterminacy of a fixed beam?
     i. Define the principle of superposition?
   j. State the Maxwell's reciprocal theorem?

PART-B (5 X 10=50 Marks)
Answer any five questions from the following.

2. a) Analyze the truss having a square form of bars of 2m lengths with both diagonal members. The truss is supported on hinge and roller at bottom joints. A 30 kN load acts on the truss at its left hand top corner towards right and toward down of the truss.. The members are of same cross sectional area and EI = constant. Use flexibility method of matrix.   [5]

   b) State the advantages of stiffness method.   [5]

3.a) Neglecting axial deformations, analyze the frame as shown in fig. EI = constant   [5]
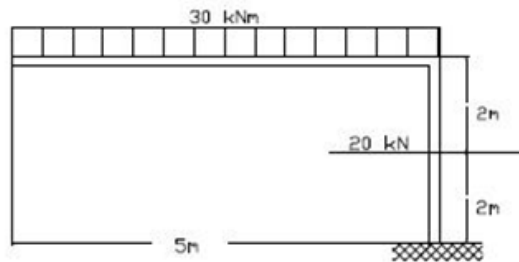
   b) Draw shear force and bending moment diagram   [5]

4 a) Analyze the beam by flexibility matrix method. EI = constant.   [5]
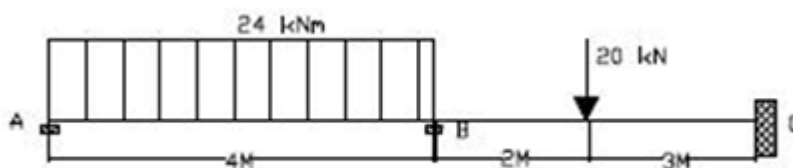
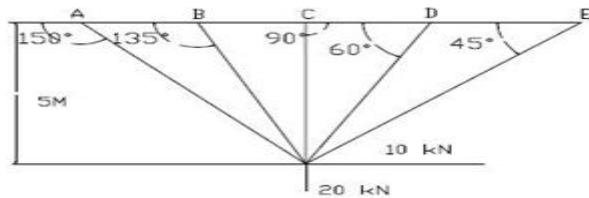   b) Draw Shear Force Diagram and Bending Moment Diagram.   [5]

5. Analyze a truss having a square from of bars of 3m lengths with both diagonal members the truss is supported on a hinge and a roller at the bottom joints. A 20 kN load acts on the truss at its right hand top corner joint towards left the members are of same c/s area and elastic properties .use flexibility matrix method   [5+5]

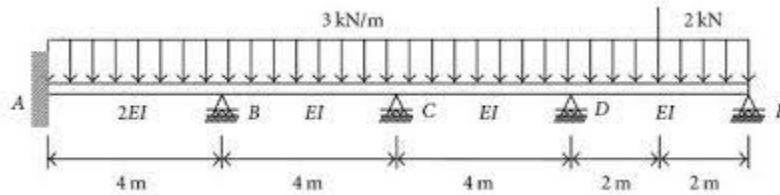6.a) Solve the truss by any method of matrix   [5]

$E = 2000 \text{ kN/cm}^2$

$A = 20 \text{ cm}^2$

b) Enumerate the basic steps in flexibility method.   [5]

7.a) Analyze the continuous beam as shown in figure by stiffness method.   [5]

b) Draw Shear Force Diagram and Bending Moment Diagram.   [5]

8.Write short notes on the following:

    a. Equivalent joint load   [5]
    b. Principle of superposition.   [5]

==0==