**Registration No:**

**Total Number of Pages : 02**                                                     **M.TECH**

**AR-17**
**M.TECH 1ST  SEMESTER EXAMINATIONS(BACK), NOV/DEC 2019**
**SE,MSEPC1030**
**MATRIX METHODS OF ANALYSIS OF STRUCTURES**

**Time: 3 Hours**                                                     **Max Marks : 70**
**The figures in the right hand margin indicate marks.**

## PART-A                                                  (10 X 2=20 MARKS)

**1. Answer the following questions.**
   **a)** Stiffness matrix is always symmetric. Comment.
   **b)** The matrix method analysis is based on which concept.
   **c)** What is the advantage of matrix analysis over classical methods of structural analysis?
   **d)** How the structures are classified?
   **e)** Differentiate between displacement and deformation.
   **f)** Define static indeterminacy.
   **g)** State different levels of structural analysis.
   **h)** What are the basic unknowns in stiffness method?
   **i)** What do you mean by equivalent joint load in matrix analysis?
   **j)** What do you mean by response of structure?

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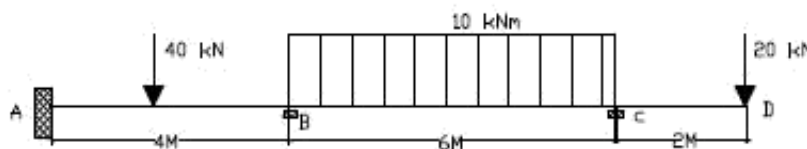**Answer any five questions from the following.**

**2.  a.** Analyze the beam by flexibility matrix method. EI = constant
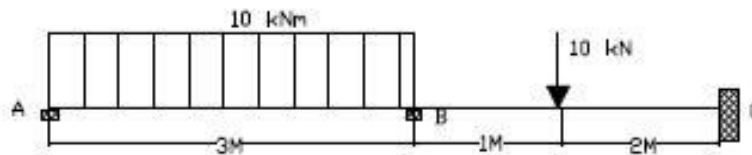


   b. Draw shear force and bending moment diagram for above solution.

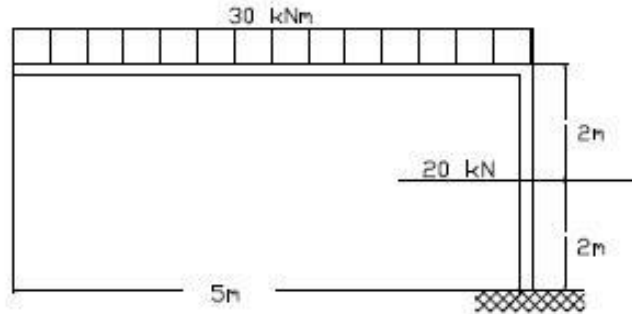**3.** Analyze the continuous beam as shown in fig. for the following conditions.
   **i)** All the supports are rigid
   **ii)** B shrinks by 100 mm under load
   **iii)** $E = 200 \times 10^6$ n/mm$^2$
   **iv)** $I = 100 \times 10^3$ mm$^4$

b. Draw shear force and bending moment diagram.

**4. a)** Neglecting axial deformations, analyze the frame as shown in fig. EI = constant.



b. Draw shear force and bending moment diagram.

**5. a.** Analyze the beam if support B sinks by 20mm.



b. Draw shear force and bending moment diagram.

**6.** a. Analyze the continuous beam having three spans each of 4m length by stiffness matrix method.

Extreme ends are fixed and intermediate supports are roller supports. The beam carries 10 kN

concentrated loads at mid-point of each span. EI = constant.

b. Draw shear force and bending moment diagram.

7 a. Explain the types of indeterminacy with formulation.

b. Calculate the degree of various type of indeterminacy.

8 a. What do you mean by flexibility method of matrix analysis?
b. What are the steps involved to solve the problem by using this method?