Hall Ticket No | | | | | | | | | | | Question Paper Code: BST201

INSTITUTE OF AERONAUTICAL ENGINEERING

(Autonomous)

M.Tech I Semester End Examinations (Regular) - February, 2017

Regulation: IARE–R16

MATRIX METHOD OF STRUCTURAL ANALYSIS

(Structural Engineering)

Time: 3 Hours **Max Marks: 70**

Answer ONE Question from each Unit
All Questions Carry Equal Marks
All parts of the question must be answered in one place only

UNIT – I

1. (a) Differentiate between static indeterminacy and kinematic indeterminacy with examples. [8 M]
   (b) Determine the degree of static indeterminacy of the pin-jointed plane frame shown in Figure 1. [6 M]

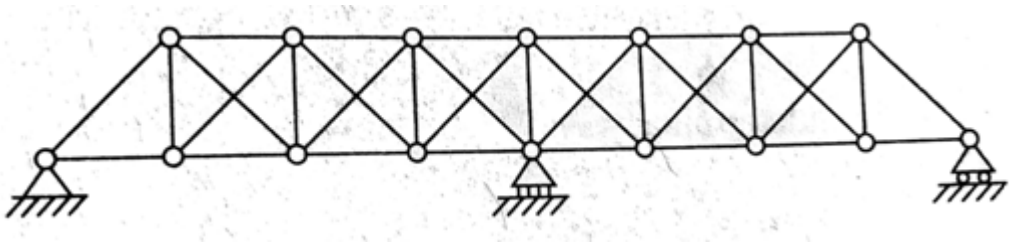

Figure 1

2. (a) Develop the flexibility matrix for prismatic member AB with hinged support at A and roller support at B as shown in Figure 2. [7 M]

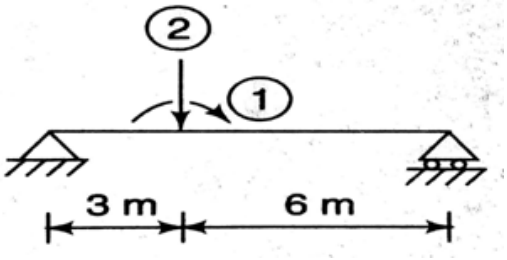

Figure 2

   (b) Develop the stiffness matrix for prismatic member AB with hinged support at A and roller support at B as shown in figure 3. [7 M]

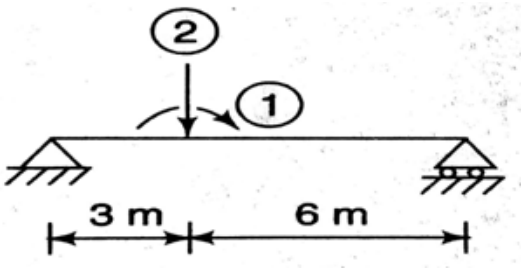

Figure 3

UNIT – II

3. (a) Determine the degree of static and kinematic indeterminacies of the beam shown in Figure 4. [6 M]

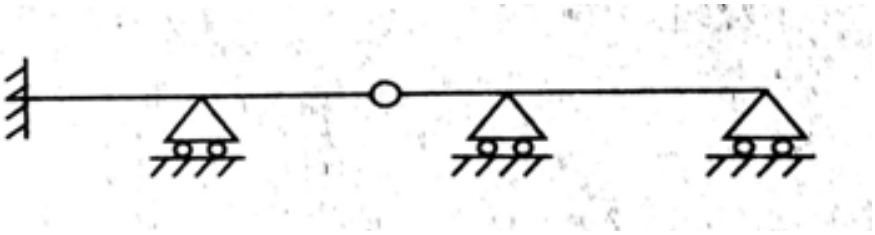

Figure 4

(b) Using the stiffness method, calculate the end deflection and rotation of a cantilever beam loaded uniformly as shown in Figure 5. EI is constant. [8 M]

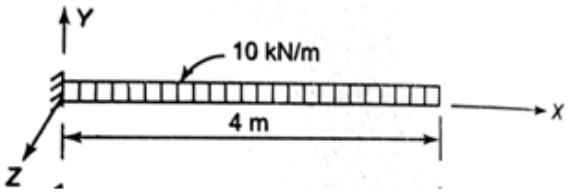

Figure 5

4. (a) Explain the step by step procedure for stiffness matrix method. [12 M]

(b) Determine the degree of freedom for the beam given in Figure 6. [2 M]

Figure 6

UNIT – III

5. Analyse the continuous beam shown in Figure 7 using flexibility method. [14 M]

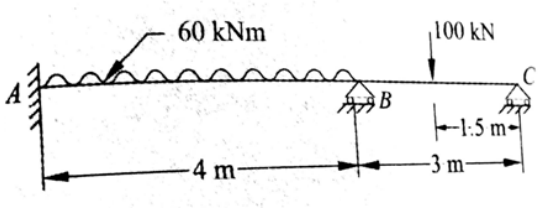

Figure 7

6. Analyse the pin-jointed structure shown in Figure 8 by using flexibility method. The cross sectional area of ach member is 2000 mm^2. Take $E = 200\ kN/mm^2$. [14 M]

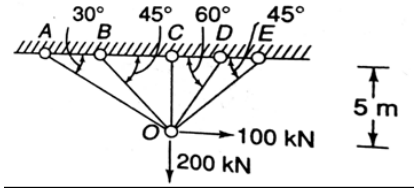

Figure 8

UNIT – IV

7. Analyse the continuous beam shown in Figure 9 using stiffness method. [14 M]

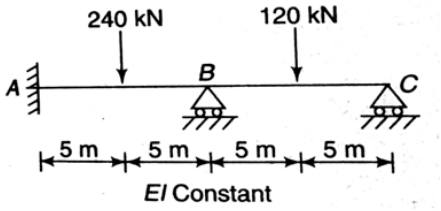

Figure 9

8. Analyse the frame shown in Figure 10 using stiffness method. [14 M]

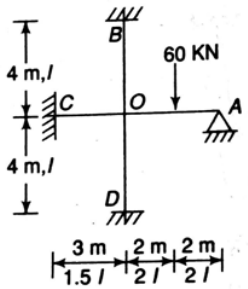

Figure 10

UNIT – V

9. Describe briefly about the behavior of large frames shear walls. [14 M]

10. Analyse the frame shown in Figure 11 and draw the B.M.D. Consider EI as constant. [14 M]

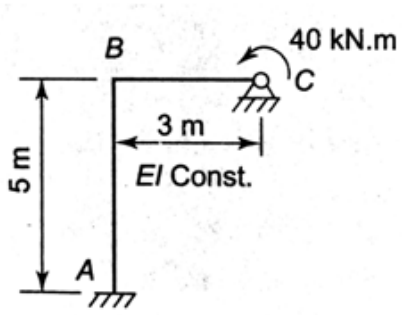

Figure 11