USN | | | | | | | | | | |

10CV751

Seventh Semester B.E. Degree Examination, June/July 2018
Matrix Method of Structural Analysis

Time: 3 hrs. Max. Marks:100

Note: 1. ***Answer FIVE full questions, selecting at least TWO questions from each part.***
2. ***Assume the missing data suitably, if any.***

PART – A

1 Explain (i) Flexibility and Stiffness (ii) Principle of contragradience (iii) Local and Global axis (iv) Boundary condition **(20 Marks)**

2 a. Derive element flexibility matrix and element stiffness matrix for the system co-ordinates shown in Fig. Q2 (a). **(10 Marks)**

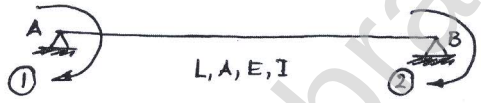

Fig. Q2 (a)

b. Develop system flexibility for a continuous beam shown in Fig. Q2 (b). Treat M_A and M_B as redundant. **(10 Marks)**

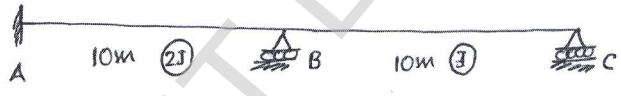

Fig. Q2 (b)

3 Analyse the frame shown in Fig. Q3 by flexibility matrix method. Draw BMD. Use element approach. **(20 Marks)**

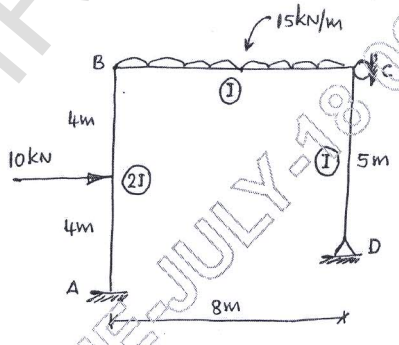

Fig. Q3

4 a. Determine the member forces in a joint loaded as shown in Fig. Q4, by force transformation
b. matrix method. AE is constant. Use element approach. **(20 Marks)**

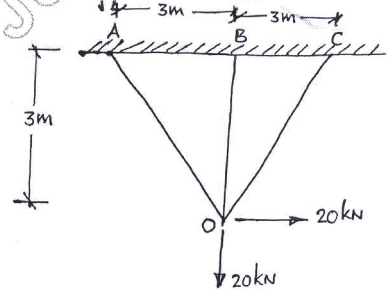

Fig. Q4

PART – B

5 Analyse the continuous beam loaded shown in Fig. Q5 by stiffness matrix method. Draw BMD and SFD. Use displacement transformation matrix method. **(20 Marks)**

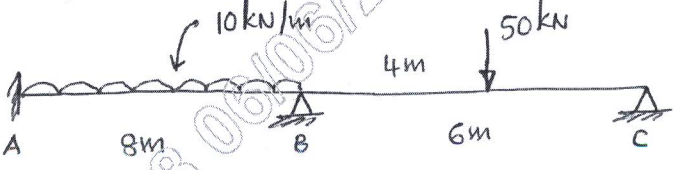

Fig. Q5

6 Analyse the frame shown in Fig. Q6 by displacement transformation matrix method. Draw BMD. **(20 Marks)**

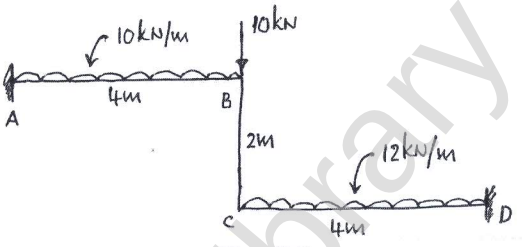

Fig. Q6

7 Find the forces in the members of a joint loaded as shown in Fig. Q7, using stiffness matrix method. Axial rigidity of all the members are same. Use element approach. **(20 Marks)**

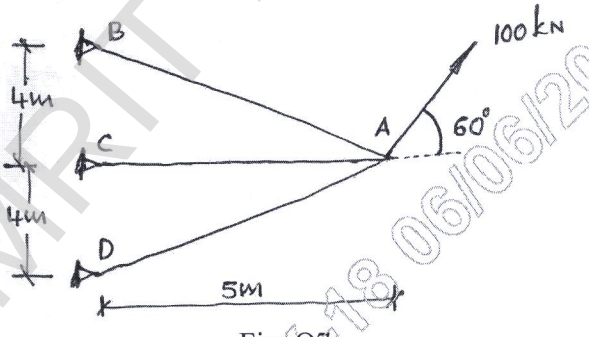

Fig. Q7

8 Analyse the continuous beam shown in Fig. Q 8 by Direct stiffness matrix method. Draw BMD. **(20 Marks)**

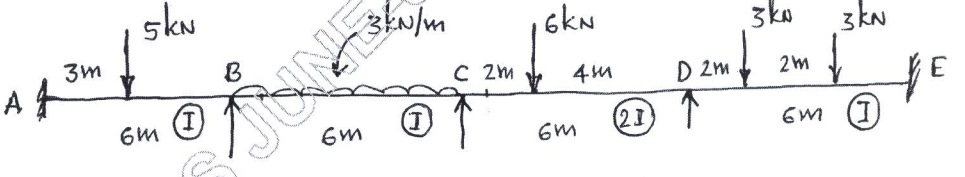

Fig. Q8

* * * * *