



**NAVRACHANA
UNIVERSITY**
a DDC recognized University

School: School of Engineering and Technology
Program/s: BTech Civil Engineering
Year: 3rd **Semester:** 6th
Examination: End Examination
Examination year: May 2023

Course Code: CE301 **Course Name:** Matrix Analysis of Framed Structures
Date: 15/05/2023
Time: 14:00 pm to 16:00 pm

Total Marks: 40
Total Pages:

Instructions:

- Use of a calculator is permitted
- Tables and data are allowed
- One book is allowed
- * COs=Course Outcome mapping. # BTL=Bloom's Taxonomy Level mapping

Q. No.	Details	Marks	COs*	BTL#
Q.1	Explain the flexibility method for indeterminate beam shown in Fig. 1. Also, draw neat sketch of all steps for showing the method. Write only the final equations.	4	CO1 .CO2	BT1, BT2
Q.2	Analyze the following beam shown in Fig. 2 using flexibility method. Consider redundant moment and force at Support A on left side. Consider vertical force and counterclockwise moment positive.	6	CO1 .CO2	BT1, BT2
Q.3	Analyze the frame shown in Fig. 3 for rotation at support B when only flexural deformations are considered. Also, find bending moment and shear force at end of span BC near support C and All the reactions at support C.	8	CO3	BTL1, BTL2,BTL3
Q.4	Obtain stiffness matrix for the frame shown in Fig. 3 when both axial and flexural deformations are included.	8	CO3	BTL1, BTL2,BTL3
Q.5	Determine the stiffness coefficients for the frame shown in Fig. 4. (1) when only flexural deformations are included (2) when axial and flexural deformations are included. Draw neat sketch showing for developing the stiffness coefficients.	8	CO3	BTL1, BTL2,BTL3
Q.6	Obtain physical significance of the flexibilities coefficients of truss shown in Fig. 5. Draw neat sketch.	3	CO1 .CO2	BT1, BT2
Q.7	Explain the steps of obtaining redundant internal member and redundant support force using flexibility method for the statically indeterminate truss shown in Fig. 6.	3	CO1, CO2	BT1, BT2

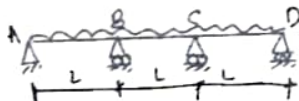


Fig. 1

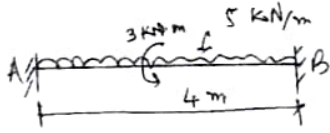


Fig. 2

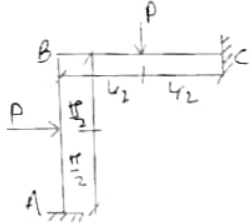


Fig. 3

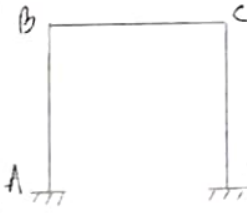


Fig. 4

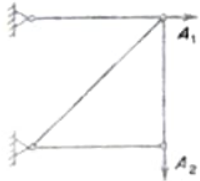


Fig. 5

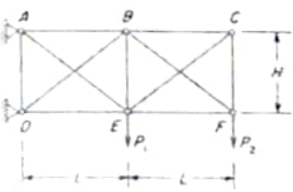


Fig. 6