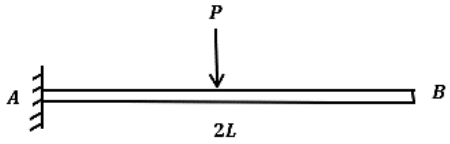
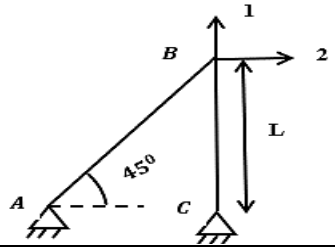
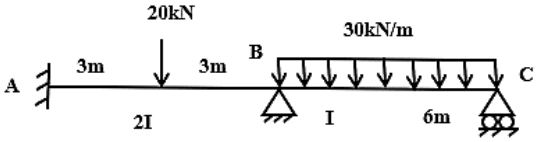
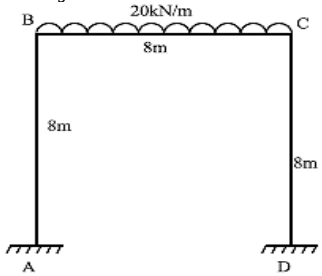
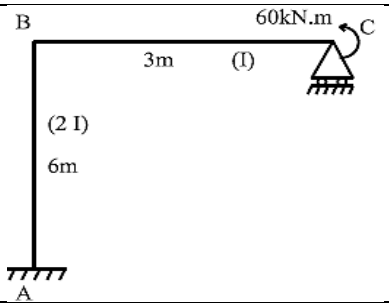
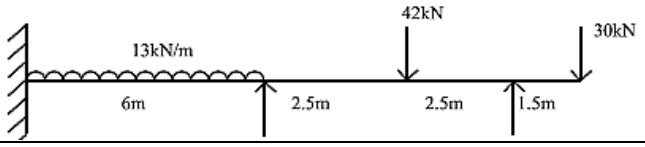
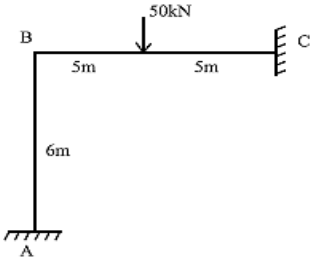
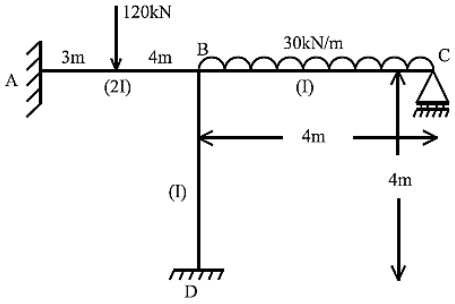
Name: Enrolment No:	UPES

UNIVERSITY OF PETROLEUM AND ENERGY STUDIES
End Semester Examination DECEMBER 2022

Course: Matrix methods of Analysis **Semester: I**
Program: M. Tech (Structures)
Time: 03 hrs. **Max. Marks: 100**
Instructions: All Questions are Compulsory **PAPER-II**

SECTION- A

S. No.		Marks	CO
Q.1	Explain the Degree of freedom of structure with examples.	**4M**	**CO1**
Q.2	Explain Structure and Element coordinates with suitable example.	**4M**	**CO2**
Q.3	Prove that flexibility is inverse of stiffness matrix.	**4M**	**CO2**
Q.4	Explain the importance of Transformation matrix in Element approach	**4M**	**CO2**
Q.5	Explain Betti's theorem with suitable example.	**4M**	**CO1**
	SECTION B		
Q.6	Determine the deflection at free end of Cantilever beam. Adopt element approach 	**10M**	**CO1**
Q.7	Determine the transformation matrix for the truss below. Adopt Element approach. 	**10M**	**CO2**
Q.8	Analyze the beam shown below by flexibility method. Adopt Element method 	**10M**	**CO3**
Q.9	Analyze the frame shown below by Stiffness method. Adopt Element method.  **OR** Analyze the frame shown in figure below by stiffness method. Adopt Element method.	**10M**	**CO4**

			
	SECTION-C		
Q.10	Analyze the beam shown below by Stiffness method. Adopt Element approach. 	**20M**	**CO3**
Q.11	Analyze the frame shown below by flexibility method. Adopt Element approach.  **OR** Analyze the frame shown below by flexibility method. Adopt element approach. 	**20M**	**CO4**