

SRM VALLIAMMAI ENGINEERING COLLEGE

SRM Nagar, Kattankulathur – 603 203

DEPARTMENT OF CIVIL ENGINEERING

QUESTION BANK



I SEMESTER

PST 203 MATRIX METHODS FOR STRUCTURAL ANALYSIS

M.E. STRUCTURAL ENGINEERING

Regulation – 2023

Academic Year: 2026– 2027

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DEPARTMENT OF CIVIL ENGINEERING
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PST 203 MATRIX METHODS FOR STRUCTURAL ANALYSIS
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SEMESTER: 01st

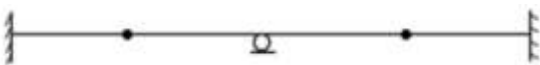
REGULATION-2023

YEAR: M.E /I

UNIT-I ENERGY CONCEPTS IN STRUCTURES

Introduction – Strain Energy – Symmetry of the Stiffness and Flexibility Matrices – Strain Energy in terms of Stiffness and Flexibility Matrices – Stiffness and Flexibility Coefficients in terms of Strain Energy – Additional properties of [a] and [k] – another Interpretation of coefficients a_{ij} and k_{ij} – Betti's law – Applications of Betti's law- Forces not at the coordinates – Strain energy in systems and in elements.

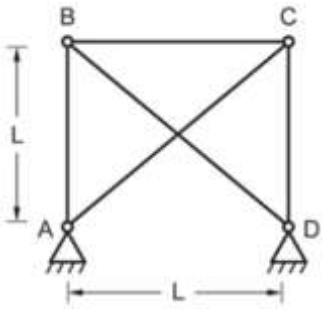
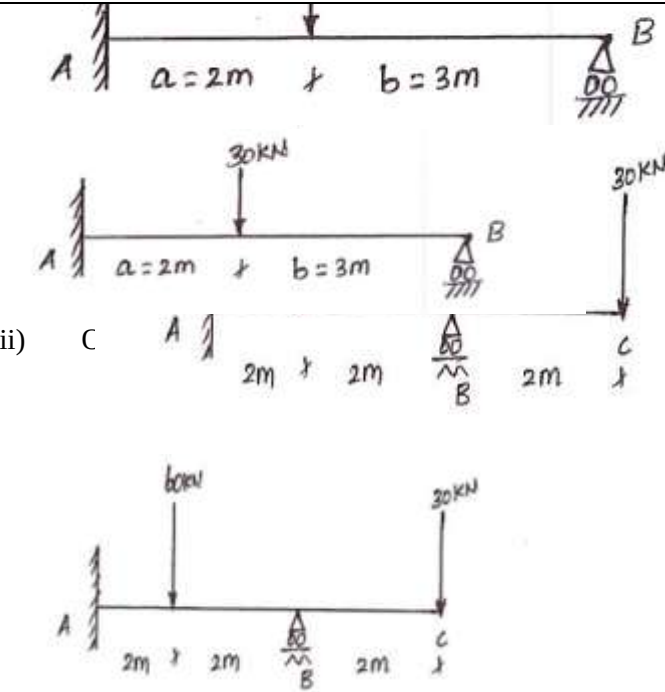
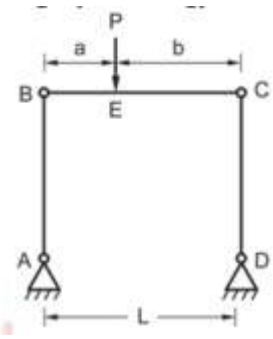
PART-A (2MARKS)

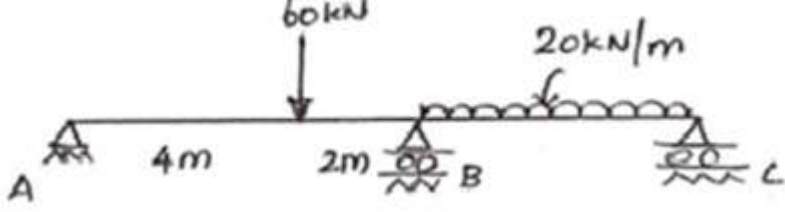
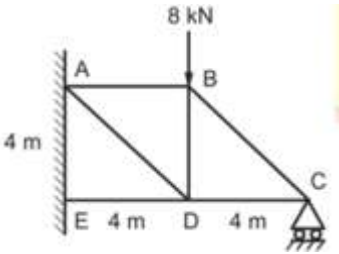
Q.No	Questions	BT Level	Competence
1.	Why is it necessary to compute deflections in structures?	BT-1	Remember
2.	What is meant by cambering technique in structures?	BT-1	Remember
3.	Name any four methods used for computation of deflections in structures.	BT-1	Remember
4.	State the difference between strain energy method and unit load method in the determination of deflection of structures.	BT-2	Understand
5.	Give the equation that is used for the determination of deflection at a given point in beams and frames.	BT-1	Remember
6.	Distinguish between pin jointed and rigidly jointed structure	BT-1	Remember
7.	Define stiffness coefficient.	BT-1	Remember
8.	Define strain energy and Proof stress.	BT-2	Understand
9.	Define Resilience, Proof Resilience and Modulus of Resilience.	BT-2	Understand
10.	State the two methods for analyzing the statically indeterminate structures	BT-2	Understand
11.	What is the strain energy stored in a rod of length l and axial rigidity AE to an axial force P ?	BT-2	Understand
12.	Define Castigliano's first theorem.	BT-2	Understand
13.	State Castigliano's second Theorem.	BT-3	Apply
14.	State the two types of strain energies.	BT-2	Understand
15.	State Maxwells Betti's law	BT-1	Remember
16.	Find the degree of indeterminacy of the structure as given below. 	BT-1	Remember

17.	Find the degree of indeterminacy of structures as given below.	BT-2	Understand
			
18.	Differentiate determinate and indeterminate of structure	BT-3	Apply
19.	Compare the force and displacement methods of analysis.	BT-3	Apply
20.	Write short notes on internal static in determinacy of pin jointed frames.	BT-3	Apply
21.	Discuss about the redundant force	BT-3	Apply
22.	Write the properties of flexibility matrices.	BT-3	Apply
23.	Write the relationship between flexibility and stiffness matrices.	BT-3	Apply
24.	Write about the principles of superposition.	BT-3	Apply
25.	A cantilever is subjected to a single concentrated load P at the middle of the span. Calculate the static indeterminacy of the beam	BT-3	Apply

PART-B (13 MARKS)

Q.No	Questions	BT Level	Competence
1.	Derive the expression for strain energy in Linear Elastic Systems for the following cases. (i) Axial loading (ii) Flexural Loading (moment (or) couple)	BT-3	Apply
2.	State and prove the expression for castigliano's first theorem	BT-3	Apply
3.	Calculate the central deflection and the slope at ends of a simply supported beam carrying a UDL w/ unit length over the whole span.	BT-3	Apply
4.	State and prove the Castigliano's second Theorem.	BT-3	Apply
5.	Derive the strain energy expression for bar element	BT-3	Apply
6.	Derive the strain energy expression for beams	BT-4	Analyze
7.	Express the Stiffness and Flexibility Coefficients in terms of Strain Energy.	BT-4	Analyze
8.	Explain the Castigliano's theorem and superposition with an example.	BT-4	Analyze
9.	Explain the properties of stiffness matrix in terms of strain energy.	BT-4	Analyze
10.	Relate flexibility and strain energy method with an example.	BT-4	Analyze
11.	A beam AB of span 3m is fixed at both the ends and carries a point load of 9 kN at C distant 1m from A. The M.O.I. of the portion AC of the beam is $2I$ and that of portion CB is I . calculate the fixed end moments and reactions.	BT-4	Analyze
12.	Determine the force in various members of the pin-jointed frame as shown in Fig. If the member BC is short by an amount of δ . All members of the	BT-3	Apply

	frame have same axial rigidity as AE. 		
13.	 ii)	BT-3	Apply
14.	Determine the horizontal reaction of the portal frame shown in Fig, by the energy method. 	BT-3	Apply
15.	Determine the deflection of the free end of cantilever of length L subjected to a point load '$W/2$' at the free end. Use Strain energy method.	BT-3	Apply
16.	Determine the deflection of the free end of cantilever of length L subjected to a point load 'W' at the free end. Use Strain Energy method	BT-3	Apply

17.	Determine the reaction components in the continuous beam in figure. Span BC is 5m length EI is constant throughout by using strain energy method.	BT-4	Analyze
			
18.	List the force methods and explain in detail about any methods with an example.	BT-4	Analyze
19.	Write in detail about the Equilibrium, Compatibility and Force displacement Relationships with an example.	BT-4	Analyze
20.	Find the forces in the members of the truss shown in Fig.. The axial rigidities are same for all the members. Use Strain Energy method.	BT-4	Analyze
			

UNIT II CHARACTERISTICS OF STRUCTURES – STIFFNESS AND FLEXIBILITY

Introduction – Structure with Single Coordinate- Two Coordinates-Flexibility and Stiffness Matrices in Coordinates- Examples-Symmetric Nature of Matrices- Stiffness and Flexibility Matrices in Constrained Measurements- Stiffness and Flexibility of Systems and Elements - Computing Displacements and Forces from Virtual Work- Computing Stiffness and Flexibility Coefficients.

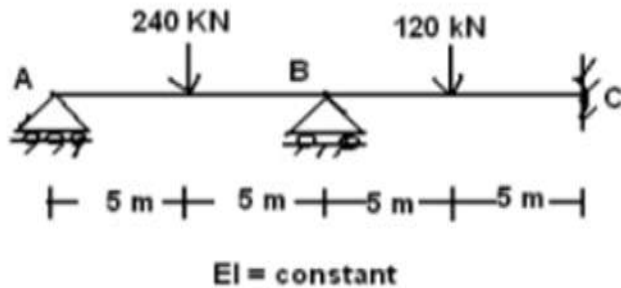
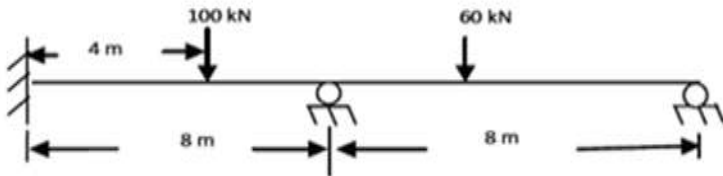
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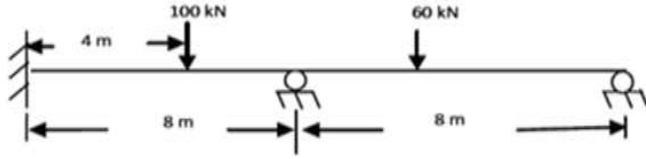
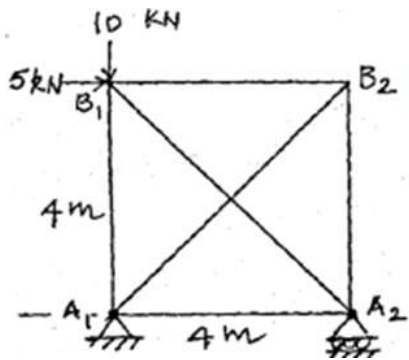
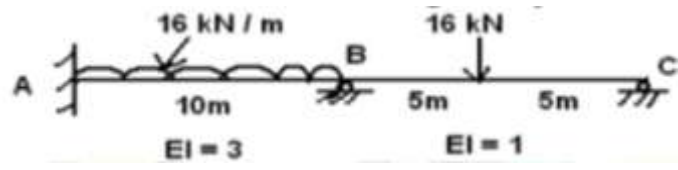
Q.No	Questions	BT Level	Competence
1.	What is the significance of unit load method?	BT-1	Remember
2.	State the basic unit load formula.	BT-1	Remember
3.	Explain Mohr's correction.	BT-1	Remember
4.	Differentiate perfect and imperfect frame.	BT-2	Understand
5.	State Maxwell's Reciprocal theorem?	BT-1	Remember

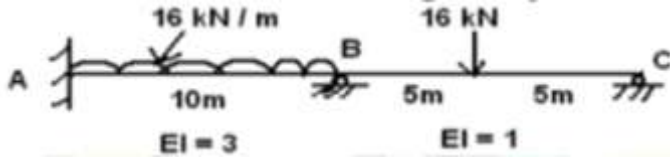
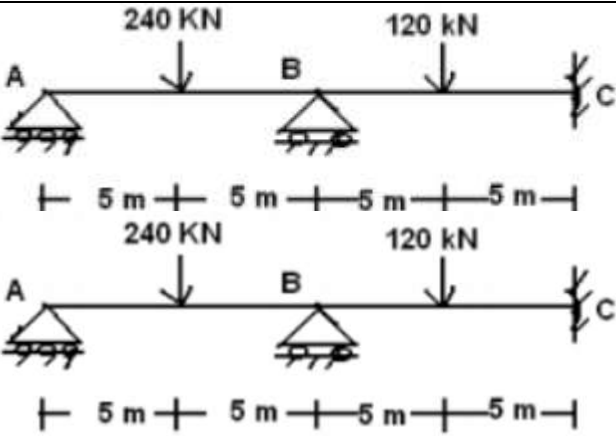
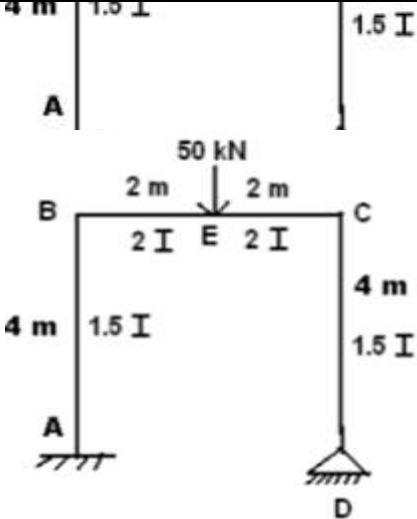
6.	Determine the free end slope of a cantilever beam having length 'L' due to an applied moment 'M' at free end using the principle of virtual work?	BT-1	Remember
7.	Distinguish between pin jointed and rigidly jointed structures. Pin jointed structures:	BT-1	Remember
8.	What are the assumptions made in the analysis of pin jointed trusses?	BT-2	Understand
9.	Give the equation that is used for the determination of deflection at a given point in truss and frames?	BT-2	Understand
10.	What are the assumptions made in the unit load method?	BT-2	Understand
11.	Define stiffness coefficient.	BT-2	Understand
12.	Define flexibility matrix.	BT-2	Understand
13.	Define stiffness matrix.	BT-3	Apply
14.	Write the equilibrium conditions.	BT-2	Understand
15.	List the classical methods of structural analysis.	BT-1	Remember
16.	What are the basic requirements of structural analysis?	BT-1	Remember
17.	Define flexibility coefficient.	BT-2	Understand
18.	Write the law of conservation of theorem.	BT-3	Apply
19.	Define Principle of virtual work.	BT-3	Apply
20.	Find the displacement at free end of the cantilever beam of span 20 m loaded with uniformly distributed load of 20kN/m.	BT-3	Apply
21.	Find the slope at free end of the cantilever beam of span 20 m loaded with uniformly distributed load of 20kN/m.	BT-3	Apply
22.	Find the displacement at under the loading point as shown in figure below.	BT-3	Apply
23.	Find the displacement at free end of the cantilever beam as shown in figure below.	BT-3	Apply
24.	Find the slope at free end of the cantilever beam as shown in figure below.	BT-3	Apply

25.	Write about williot's mohr diagram.	BT-3	Apply

PART-B (13 MARKS)

Q.No	Questions	BT Level	Competence
1.	Find the flexibility coefficients of the continuous beam ABC shown in Fig below by unit load method and draw the bending moment diagram.  $EI = \text{constant}$	BT-3	Apply
2.	A two span continuous beam ABCD is fixed at A and hinged at support B and C. span of AB = Span of BC = 9m. Arrange the flexibility influence co-efficient matrix assuming vertical reaction at B and C as redundant.	BT-3	Apply
3.	Determine the deflection of the free end of cantilever of length L subjected to a point load 'W/2' at the free end. Use unit load method.	BT-3	Apply
4.	Find the flexibility coefficients of the continuous beam ABC shown in Fig below by unit load method and draw the bending moment diagram. 	BT-3	Apply
5.	A two span continuous beam ABC rests on simple supports at A, B and C. All the three supports are at same level. The span AB = 7m and span BC = 5m. The span AB carries a uniformly distributed load of 100 kN/m and span BC carries a central point load of 50 kN. EI is constant for the whole beam. Find the flexibility coefficients moments and reactions at all the support using virtual work method.	BT-3	Apply

6. .	A two span continuous beam ABC is fixed at A and C and rests on simple support at B. All the three supports are at same level. The span AB=4.5m and span BC=8m. The span AB carries a uniformly distributed load of 50 kN/m and span BC carries a central point load of 75kN. EI is constant for the whole beam. Find the flexibility and stiffness coefficients.	BT-4	Analyze
7.	A two span continuous beam ABC rests on simple supports at A,B and C.All the three supports are at same level. The span AB=7m and span BC=5m. The span AB carries a uniformly distributed load of 100 kN/m and span BC carries a central point load of 50kN. EI is constant for the whole beam. Find the deflection at B and C by using virtual work method..	BT-4	Analyze
8.	Find the deflection the supports B and C of continuous beam ABC shown in Fig below by unit load method.	BT-4	Analyze
			
9.	Analyze the pin-jointed plane frame shown in Fig below by unit load method.	BT-4	Analyze
			
10.	Find the deflections at B and C of the continuous beam ABC shown in Fig below by virtual work method.	BT-4	Analyze
			

11.	Find the flexibility and stiffness coefficients of the continuous beam ABC shown in Fig below by virtual work method.	BT-4	Analyze
			
12.		in figure, below by agram. Assume	Apply
13.	A two span continuous beam ABCD is fixed at A and hinged at support B and C. span of AB =Span of BC =10 m. Arrange the flexibility influence co-efficient matrix assuming vertical reaction at B and C as redundant.	BT-3	Apply
14.		shown in Fig below by unit load noment diagram.	Apply
15.	A portal frame ABCD with supports A and D are fixed at same level carries a concentrated load of 100kN at center of the span AB. Span AB=BC=CD=10 m. EI is constant throughout. Analyze the frame by virtual work method.	BT-3	Apply
16.	A two span continuous beam ABCD is fixed at A and hinged at support B and C. span of AB =Span of BC =8m. Generate the flexibility and Stiffness coefficients by using virtual work method.	BT-3	Apply

17.	Explain the Stiffness and Flexibility Matrices in Constrained Measurements.	BT-4	Analyze
18.	Elaborate the Stiffness and Flexibility of Systems and Elements in detail	BT-4	Analyze
19.	Prove the Maxwell's Reciprocal theorem with an example.	BT-4	Analyze
20.	Find the slope and deflections of a propped cantilever beam with point load at midspan using virtual work method.	BT-4	Analyze

UNIT III TRANSFORMATION OF INFORMATION IN STRUCTURES

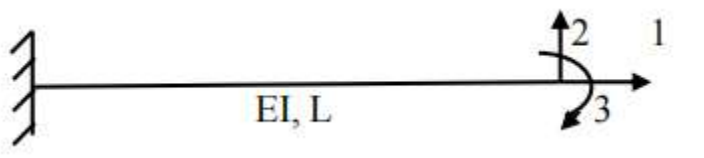
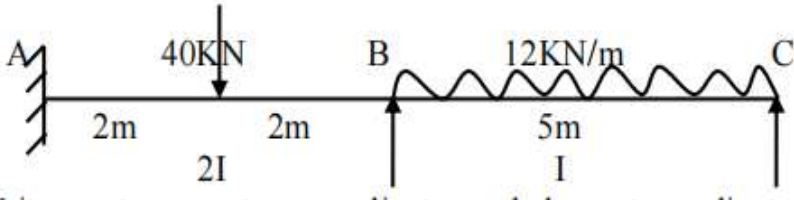
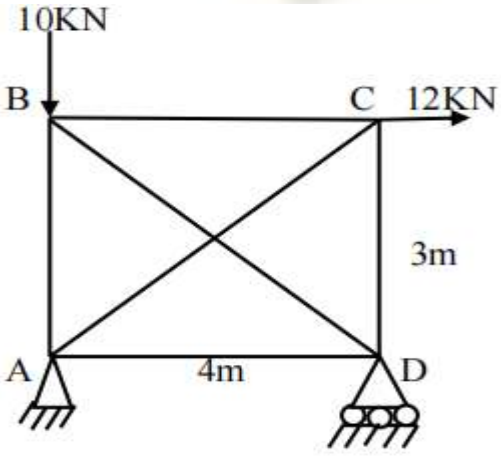
Determinate- Indeterminate Structures-Transformation of System Forces to Element Forces- Element Flexibility to System Flexibility - System Displacement to Element Displacement- Element Stiffness to System Stiffness- Transformation of Forces and Displacements in General–Stiffness and Flexibility in General–Normal Coordinates and Orthogonal Transformation- Principle of superposition.

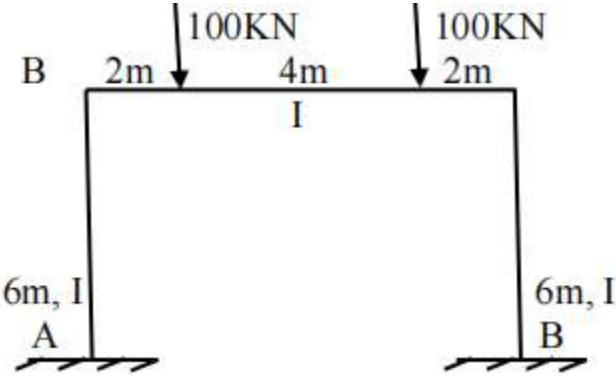
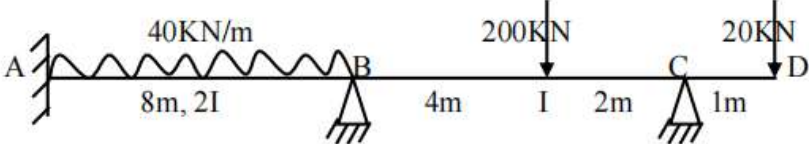
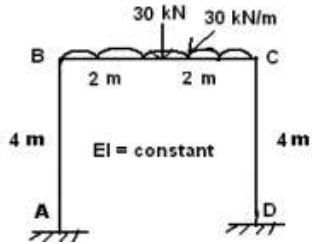
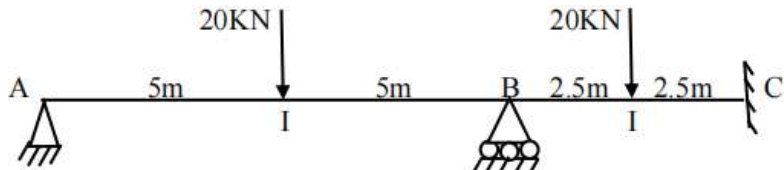
PART-A (2MARKS)

Q.No	Questions	BT Level	Competence
1.	Define: transformation matrices.	BT-1	Remember
2.	Differentiate force transformation matrices and displacement transformation matrices.	BT-1	Remember
3.	What is mean by element flexibility Matrix?	BT-1	Remember
4.	What is mean by System flexibility Matrix?	BT-2	Understand
5.	Distinguish between element coordinate and system coordinate.	BT-1	Remember
6.	State the force transformation matrix?	BT-1	Remember
7.	Define principle of contragredience.	BT-1	Remember
8.	Define: system stiffness matrix.	BT-2	Understand
9.	Define: element stiffness matrix.	BT-2	Understand
10.	Prove that stiffness matrix is inverse of flexibility matrix	BT-2	Understand
11.	Write short notes on system coordinate.	BT-2	Understand
12.	Write short notes on element coordinate.	BT-2	Understand
13.	List out the properties of stiffness matrix.	BT-3	Apply
14.	Explain in local coordinates in matrix method.	BT-2	Understand
15.	Describe in global coordinates in matrix method.	BT-1	Remember
16.	Define degree of freedom	BT-1	Remember
17.	Write down the basic requirement of matrix method of analysis?	BT-2	Understand
18.	Distinguish between flexibility coefficient and stiffness coefficient.	BT-3	Apply
19.	Define consistent deformation method.	BT-3	Apply

20.	Define equilibrium method.	BT-3	Apply
21.	Write down the assumption made in matrix method.	BT-3	Apply
22.	Define primary structure.	BT-3	Apply
23.	Define degree of static indeterminacy.	BT-3	Apply
24.	Define principle of superposition	BT-3	Apply
25.	Explain in detail orthogonal transformation.	BT-1	Remember

PART-B (13 MARKS)

Q.No	Questions	BT Level	Competence
1.	Analyse the member flexibility matrix for the beam shown in fig. 	BT-3	Apply
2.	Analyze a continuous beam as is shown figure using force transformation matrix for the beam shown in fig. by element approach. 	BT-3	Apply
3.	Analyse the given truss shown in fig. by flexibility method using force transformation matrix. Draw BMD and elastic curve. Assume $L/AE = 1$ for all the members. 	BT-3	Apply
4.	the Analyse rigid	BT-3	Apply

	jointed frame shown in fig. by flexibility method using force transformation approach. Draw BMD and elastic curve. 		
5.	Analyze the given beam by stiffness method using displacement transformation approach. Draw BMD and elastic curve. 	BT-3	Apply
6.	Analyse the given frame in fig. by stiffness method. Use element approach. Draw BMD. 	BT-4	Analyze
7.	Assemble structure stiffness matrix for the given beam in fig. EI is constant. 	BT-4	Analyze
8.	Analyse the given truss in fig., using direct stiffness method. Take $AE = 1$ for all members.	BT-4	Analyze

9.	Analyze a continuous beam as is shown figure using force transformation matrix for the beam shown in fig. by element approach.	BT-4	Analyze
10.	Analyze a continuous beam as is shown figure using force transformation matrix for the beam shown in fig. by element approach.	BT-4	Analyze
11.	Analyze a continuous beam as is shown figure using force transformation matrix for the beam shown in fig. by element approach.	BT-4	Analyze
12.	Analyze a continuous beam as is shown figure using force transformation matrix for the beam shown in fig. by element approach.	BT-3	Apply

13.	Analyze a continuous beam as is shown figure using force transformation matrix for the beam shown in fig. by element approach.	BT-3	Apply
14.		BT-3	Apply
15.		BT-3	Apply
16.		BT-3	Apply
17.		BT-3	Apply
18.		BT-4	Analyze
19.		BT-4	Analyze
20.		BT-4	Analyze

UNIT IV THE FLEXIBILITY METHOD

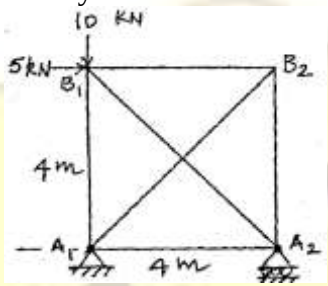
Statically Determinate Structures –Indeterminate Structures-Choice of Redundant Leading to Ill and Well-conditioned Matrices-Transformation to one set of redundant to another-Internal forces due to thermal expansion and Lack of Fit-reducing the size of Flexibility Matrix- Application to Pin-Jointed Plane Truss-Continuous Beams-Frames- Grids.

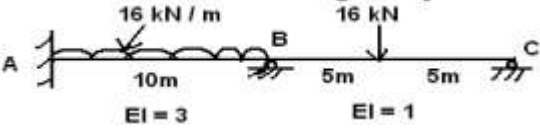
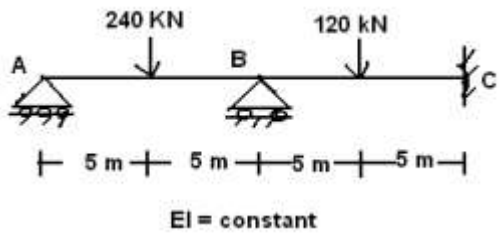
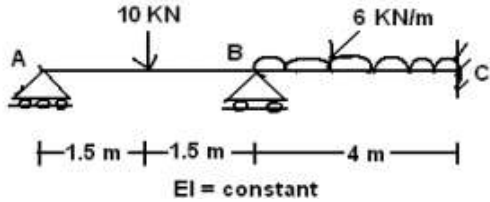
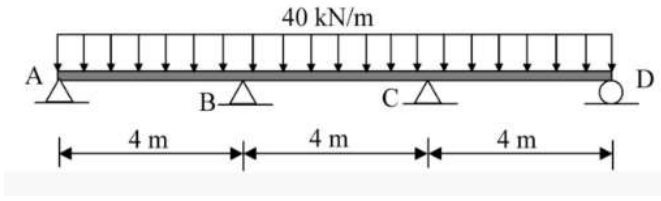
PART-A (2MARKS)

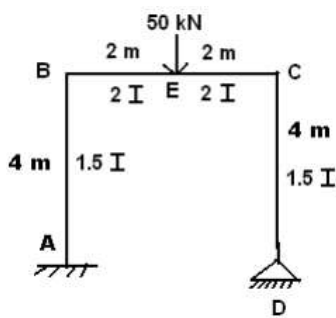
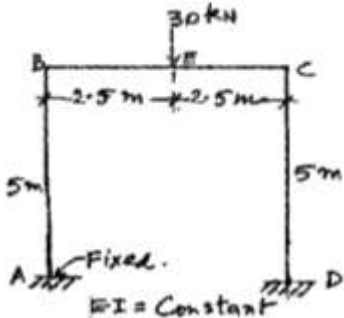
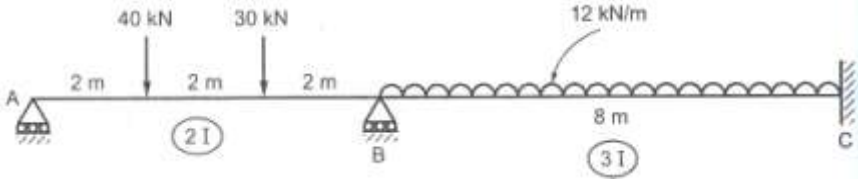
Q.No	Questions	BT Level	Competence
1.	What are the conditions to be satisfied for determinate structures and how are indeterminate structures identified?	BT-1	Remember
2.	Write down the equation for the degree of static indeterminacy of the pin jointed Plane frames, explain the notations used.	BT-1	Remember
3.	Give the mathematical expression for the degree of static indeterminacy of rigid jointed plane frames.	BT-1	Remember
4.	What are the properties which characterize if the structure response by means of force-displacement relationship?	BT-2	Understand
5.	List the classical methods of structural analysis.	BT-1	Remember

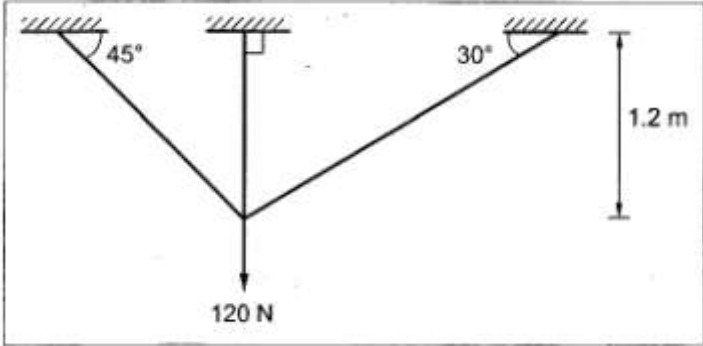
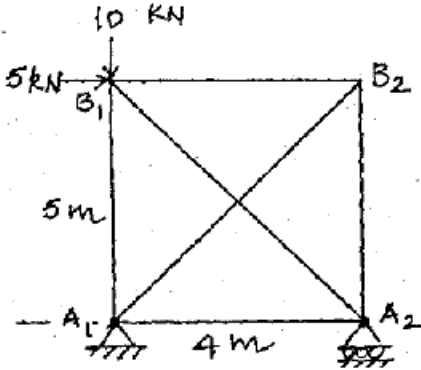
6.	What is meant by flexibility?	BT-1	Remember
7.	In flexibility method unknown quantities are -----and final equations are-----	BT-1	Remember
8.	Define indeterminate structures.	BT-2	Understand
9.	What is a primary structure?	BT-2	Understand
10.	What are equilibrium equations?	BT-2	Understand
11.	What are the different methods of analysis of indeterminate structures?	BT-2	Understand
12.	Differentiate Stiffness method from flexibility method.	BT-2	Understand
13.	What are the basic requirements of structural analysis?	BT-3	Apply
14.	Write the equation for degree of indeterminacy of 2D trusses.	BT-2	Understand
15.	What is meant by compatibility condition?	BT-1	Remember
16.	Write the element Flexibility matrix for a beam member and truss member.	BT-1	Remember
17.	Define flexibility coefficient.	BT-1	Remember
18.	Choose the correct answer. The flexibility method is best suited when the static indeterminacy is -----the kinematic indeterminacy. (a) Less than (b) Equal to (C) Greater than .	BT-2	Understand
19.	List the variables in the force method.	BT-1	Remember
20.	Define External and Internal indeterminacy.	BT-1	Remember
21.	Briefly mention the two types of matrix methods of analysis of indeterminate structures.	BT-1	Remember
22.	Define a primary structure.	BT-2	Understand
23.	What is meant by generalized coordinates?	BT-2	Understand
24.	Explain the compatibility condition used in the flexibility method?	BT-2	Understand
25.	What is the displacement transformation matrix?	BT-2	Understand

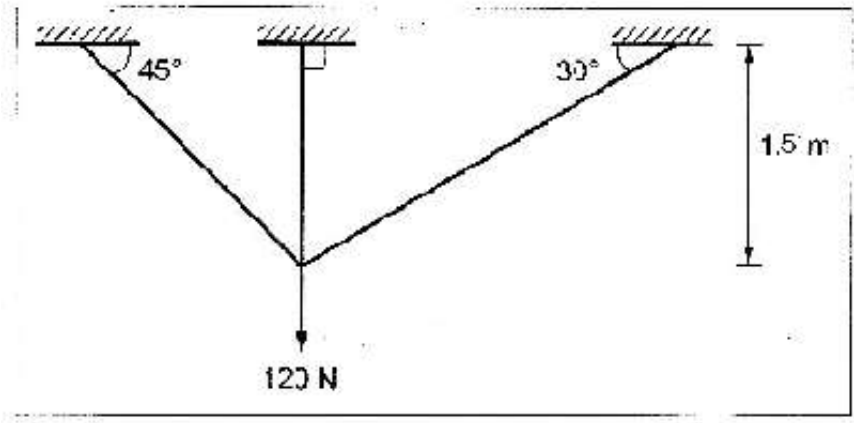
PART-B (13 MARKS)

Q.No	Questions	BT Level	Competence
1.	Analyse the pin-jointed plane frame shown in Fig below by flexibility matrix method. The flexibility for each member is 0.0025 mm/KN. 	BT-3	Apply
2.	Analyse the continuous beam ABC shown in Fig below by flexibility	BT-3	Apply

	matrix method and draw the bending moment diagram.		
			
3.	Generate the flexibility matrix of beam ABC as shown in figure, below by flexibility matrix method and sketch the bending moment diagram. 	BT-3	Apply
4.	A two span continuous beam ABCD is fixed at A and hinged at support B and C. span of AB = Span of BC = 9m. Arrange the flexibility influence co-efficient matrix assuming vertical reaction at B and C as redundant.	BT-3	Apply
5.	Calculate the deflection and moments of continuous beam shown in Fig below using force method. 	BT-3	Apply
6.	A cantilever is subjected to a single concentrated load P at the middle of the span. Calculate the deflection at the free end using flexibility matrix method. EI is uniform throughout.	BT-4	Analyze
7.	Analyze the continuous beam ABCD shown in Fig below by flexibility matrix method and draw the bending moment diagram. M_B and M_C are redundant 	BT-4	Analyze
8.	A portal frame ABCD with supports A and D are fixed at same level carries a uniformly distributed load of 80kN/m on the span AB. Span AB=BC=CD=9m. EI is constant throughout. Analyze the frame by stiffness matrix method.	BT-4	Analyze

9.	Solve the portal frame ABCD shown in Fig below by flexibility matrix method and sketch the bending moment diagram. 	BT-4	Analyze
10.	Solve the portal frame ABCD shown in Fig below by flexibility matrix method and sketch the bending moment diagram. 	BT-4	Analyze
11.	A portal frame ABCD with supports A and D are fixed at same level carries a concentrated load of 100kN at centre of the span AB. Span AB=BC=CD=10 m. EI is constant throughout. Analyze the frame by stiffness matrix method.	BT-4	Analyze
12.	Examine the moment of the continuous beam shown in Fig below by flexibility method. 	BT-3	Apply

13.	Estimate the forces in all the members of the pin-jointed frames shown in Fig below by flexibility method, $AE = \text{constant}$. 	BT-3	Apply
14.	A cantilever beam is subjected to an udl of w kN/m throughout the entire span. Calculate the deflection at the free end using flexibility matrix method. EI is uniform throughout.	BT-3	Apply
15.	A portal frame ABCD with supports A and D are fixed at same level carries a uniformly distributed load of 100 kN/m on the span AB. Span $AB=BC=CD=5$ m. EI is constant throughout. Analyze the frame by stiffness matrix method.	BT-3	Apply
16.	Analyse the pin-jointed plane frame shown in Fig below by flexibility matrix method. 	BT-3	Apply
17.	Estimate the forces in all the members of the pin-jointed frames shown in Fig below by flexibility method, $AE = \text{constant}$.	BT-3	Apply

			
18.	Elaborate the applications to Pin-Jointed Plane Truss with an example	BT-4	Analyze
19.	Write the analysis procedure for pin jointed truss by flexibility matrix method	BT-4	Analyze
20.	Write the analysis procedure for continuous beam by flexibility matrix method	BT-4	Analyze

UNIT V THE STIFFNESS METHOD

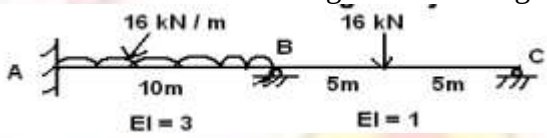
Introduction-Development of Stiffness Method- Stiffness Matrix for Structures with zero force at some coordinates-Analogy between Flexibility and Stiffness-Analysis due to thermal expansion and Lack of Fit-Application of Stiffness approach to Pin Jointed Plane Trusses-Continuous Beams- Frames-Grids-Space Trusses and Frames- Introduction only-Static Condensation Technique- Choice of Method-Stiffness or Flexibility.

PART-A (2MARKS)

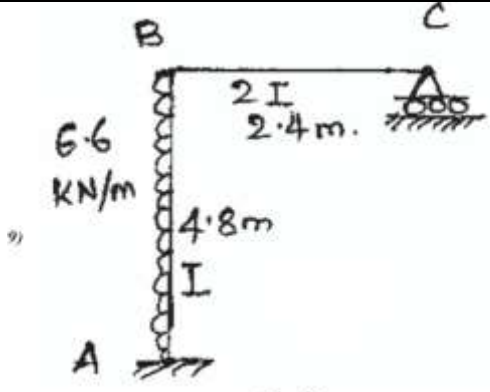
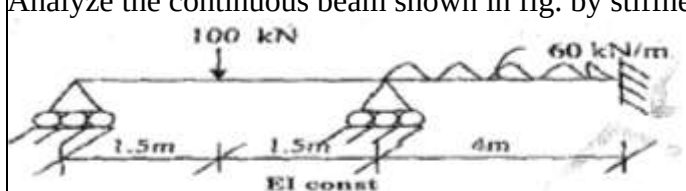
Q.No	Questions	BT Level	Competence
1.	What are the basic unknowns in stiffness matrix method?	BT-1	Remember
2.	Define degree of freedom of the structure with an example.	BT-1	Remember
3.	Explain the global stiffness matrices.	BT-1	Remember
4.	What are the basic unknowns in stiffness matrix method?	BT-2	Understand
5.	What is transformation matrix?	BT-1	Remember
6.	Define Local and Global coordinates.	BT-1	Remember
7.	Define Stiffness coefficient k_{ij} .	BT-1	Remember
8.	Write down the rotation matrix for 2D beam element.	BT-2	Understand
9.	Which property of a structure determines the size of its stiffness matrix?	BT-2	Understand
10.	Explain the terms stiffness matrix and flexibility matrix. Show that	BT-2	Understand

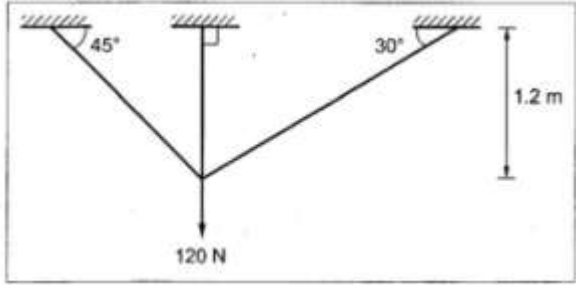
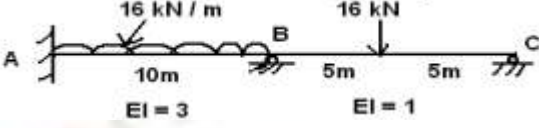
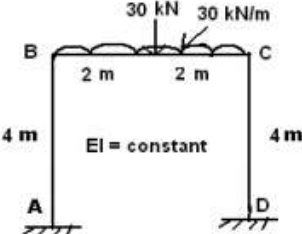
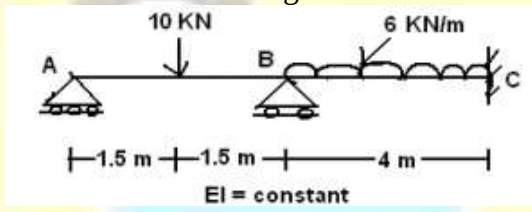
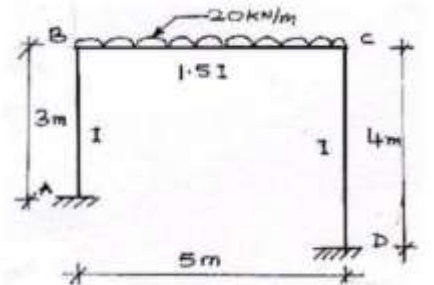
	these are inverse of each other.		
11.	What is meant by relative stiffness of a member?	BT-2	Understand
12.	Create the stiffness matrix for a 2D beam element	BT-2	Understand
13.	Explain the steps involved in stiffness matrix method of analysis.	BT-3	Apply
14.	Write a note on element stiffness matrix.	BT-2	Understand
15.	Is it possible to develop the flexibility matrix for an unstable structure?	BT-1	Remember
16.	Differentiate between flexibility and stiffness.	BT-1	Remember
17.	Explain about the properties of stiffness matrix.	BT-1	Remember
18.	How are the basic equations of stiffness matrix obtained?	BT-2	Understand
19.	Explain about generalized coordinates.	BT-1	Remember
20.	Explain the equilibrium condition used in the stiffness method.	BT-1	Remember
21.	Derive the stiffness matrix of a typical pin-jointed two-dimensional frame element.	BT-1	Remember
22.	Properties of stiffness Matrix	BT-2	Understand
23.	Types of Boundary Condition	BT-2	Understand
24.	Explain formation of load Vector	BT-2	Understand
25.		BT-2	Understand

PART-B (13 MARKS)

Q.No	Questions	BT Level	Competence
1.	Analyse the continuous beam ABC shown in Fig below By stiffness method and also sketch the bending moments diagram. 	BT-4	Analyze
2.	Analyse the portal frame ABCD shown in Fig below by stiffness method and also sketch the bending moment diagram.	BT-4	Analyze

3.	Examine the continuous beam ABC shown in Fig below by stiffness method and also draw the shear force diagram.	BT-3	Apply
4.	Analyze the portal frame ABCD shown in Fig below by stiffness method and also estimate the bending moment.	BT-3	Apply
5.	Compute the final forces of continuous beam shown in Fig below using displacement method.	BT-3	Apply
6.	Analyse the truss shown in Fig below using displacement method.	BT-3	Apply
7.	Solve the portal frame shown in Fig below by matrix stiffness method and sketch the SFD and BMD. Given EI is constant.	BT-3	Apply

			
8.	A two span continuous beam ABC is fixed at A and simply supported over the supports B and C. AB=6m and BC = 4m. Moment of inertia is constant throughout. A uniformly distributed load of 2 Ton/m acts over AB and a single concentrated load of 6 tons acts on BC. Estimate BM by stiffness matrix method.	BT-4	Analyze
9.	A portal frame ABCD with A and D are fixed at same level carries a uniformly distributed load of 2 tons /meters. EI is constant throughout. Assess the final forces by stiffness matrix method. Take Span AB=BC=CD=6m.	BT-4	Analyze
10.	A continuous beam ABC is fixed at A and simply supported over the supports B and C. AB = 11m and BC = 9m. Moment of inertia is constant throughout. A single concentrated central load of 12 tons acts on AB and a uniformly distributed load of 10Tons/m acts over BC,examine the final forces by stiffness matrix method and draw BMD.	BT-4	Analyze
11.	A continuous beam ABCB is simply supported over the supports A, B, C and D. AB = 10m , BC = 8m and CD=10m. Moment of inertia is constant throughout. A single concentrated central load of 12 tons acts on AB and a uniformly distributed load of 10Tons/m acts over BC,examine the final forces by stiffness matrix method and draw BMD.	BT-4	Analyze
12.	Analyze the continuous beam shown in fig. by stiffness matrix method	BT-4	Analyze
			
13.	A portal frame ABCD with A and D are fixed at same level Span AB carries a uniformly distributed load of 20kN /meters. EI is constant throughout. Assess the final forces by stiffness matrix method. Span	BT-4	Analyze
14.	Estimate the forces in all the members of the pin-jointed frames shown in Fig below by Stiffness matrix method, AE = constant.	BT-3	Apply

			
15.	Analyse the continuous beam ABC shown in Fig below By stiffness method and also sketch the bending moments diagram. 	BT-3	Apply
16.	Analyse the portal frame ABCD shown in Fig below by stiffness method and also sketch the bending moment diagram. 	BT-3	Apply
17.	Examine the continuous beam ABC shown in Fig below by stiffness method and also draw the shear force diagram. 	BT-3	Apply
18.	Solve the portal frame ABCD shown in Fig below by stiffness matrix method . 	BT-3	Apply
19.	A portal frame ABCD with A and D are fixed at same level span AB=6m carries a uniformly distributed load of 20kN /meters. Span BC = CD=5m carries uniformly distributed load of 5kN/m EI is constant throughout. Assess the final forces by stiffness matrix method.	BT-3	Apply
20.	Elaborate in detail about the static Condensation Technique.	BT-4	Analyze

