Ref No:

SRI KRISHNA INSTITUTE OF TECHNOLOGY

COURSE PLAN

Academic Year 2019 - 2020

Program:	B E – Civil Engineering
Semester :	5
Course Code:	17CV52
Course Title:	Analysis of Indeterminate Structures
Credit / L-T-P:	4 / 4-0-0
Total Contact Hours:	50
Course Plan Author:	DR. K NARESH

Academic Evaluation and Monitoring Cell

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Note : Remove "Table of Content" before including in CP Book
Each Course Plan shall be printed and made into a book with cover page
Blooms Level in all sections match with A.2, only if you plan to teach / learn at higher levels

17CV52 : Analysis of Indeterminate Structures

A. COURSE INFORMATION

1. Course Overview

Degree:	Civil Engineering	Program:	B.E
Year / Semester :	2019/V	Academic Year:	2019-20
Course Title:	Analysis of Indeterminate Structures	Course Code:	17CV52
Credit / L-T-P:	04	SEE Duration:	180 Minutes
Total Contact Hours:	50	SEE Marks:	60 Marks
CIA Marks:	40 Marks	Assignment	1 / Module
Course Plan Author:	Dr. K. Naresh	Sign	Dt:
Checked By:	MOHAN K T	Sign	Dt:

2. Course Content

Module	Module Content	Teaching Hours	Module Concepts	Blooms Level
1	**SLOPE DEFLECTION METHOD:**Introduction, sign convention, development of slope deflection equation, analysis of continuous beams including settlements,Analysis of orthogonal rigid plane frames including sway frames with kinematic indeterminacy ≤ 3	10	slope	L2, L4, L5
2	**MOMENT DISTRIBUTION METHOD:**Introduction, Definition of terms, Development of method, Analysis of continuous beams with support yielding, Analysis of orthogonal rigid plane frames including sway frames with kinematic indeterminacy ≤ 3	10	Distribution factor carry over moment	L2, L4, L5
3	**KANI'S METHOD:** Introduction, Concept, Relationships between bending moment and deformations, Analysis of continuous beams with and without settlements, Analysis of frames with and without sway	10	Rotation factor kani's box	L2, L4, L5
4	**MATRIX METHOD OF ANALYSIS (FLEXIBILITY METHOD)** :Introduction, Axes and coordinates, Flexibility matrix, Analysis of continuous beams and plane trusses using system approach,Analysis of simple orthogonal rigid frames using system approach with static indeterminacy ≤ 3.	10	Displacement formation of flexibility matrix	L2, L4, L5
5	**MATRIX METHOD OF ANALYSIS (STIFFNESS METHOD)** Introduction, Stiffness matrix, Analysis of continuous beams and plane trusses using system approach. Analysis of simple orthogonal rigid frames using system approach with kinematic indeterminacy ≤ 3.	10	Rotation formation of stiffness matrix	L2, L4, L5

3. Course Material

Module	Details	Available
1	Text books	
a)	Indeterminate Structural Analysis -K.U. Muthu, H.Narendra etal,	In Lib
2	Reference books	
a)	Indeterminate Structural Analysis -Wang C K, McGraw Hill	In dept
3	Others (Web, Video, Simulation, Notes etc.)	Not Available

4. Course Prerequisites

SNo	Course Code	Course Name	Module / Topic / Description	Sem	Remarks	Blooms Level

1	17cv42	Analysis of determinate structures	Conditions of equilibrium, Degree of freedom, static and kinematic indeterminacy.	4	-	L2,L5
2	17cv32	Strength of materials	Shear force and bending moment diagrams	3	-	L4,L5

Note: If prerequisites are not taught earlier, GAP in curriculum needs to be addressed. Include in Remarks and implement in B.5.

B. OBE PARAMETERS

1. Course Outcomes

#	COs	Teach. Hours	Concept	Instr Method	Assessment Method	Blooms' Level
17cv52.1	Student should be able to determine the moments in indeterminate beams with or without sinking having constant moment of inertia or variable moment of inertia using slope deflection method.	05	slope	Black board	Internal assessment and Assignment	L2, L4, L5
17cv52.2	Student should be able to determine the moments in frames subjected to sway or non sway having constant moment of inertia or variable moment of inertia using slope deflection method.	05	slope	Black board	Internal assessment and Assignment	L2, L4, L5
17cv52.3	Student should be able to determine the moments in indeterminate beams with or without sinking having constant moment of inertia or variable moment of inertia using moment distribution method.	05	Distribution factor carry over moment	Black board	Internal assessment and Assignment	L2, L4, L5
17cv52.4	Student should be able to determine the moments in frames subjected to sway or non sway having constant moment of inertia or variable moment of inertia using moment distribution method.	05	Distribution factor carry over moment	Black board	Internal assessment and Assignment	L2, L4, L5
17cv52.5	Student should be able to determine the moments in indeterminate beams with or without sinking having constant moment of inertia or variable moment of inertia using Kani's method.	05	Rotation factor kani's box	Black board	Internal assessment and Assignment	L2, L4, L5
17cv52.6	Student should be able to determine the moments in frames subjected to sway or non sway having constant moment of inertia or variable moment of inertia using Kani's method.	05	Rotation factor kani's box	Black board	Internal assessment and Assignment	L2, L4, L5
17cv52.7	Student should be able to determine the moments in indeterminate beams with or without sinking having constant moment of inertia or variable moment of inertia using Flexibility	05	Displacement formation of flexibility matrix	Black board	Internal assessment and Assignment	L2, L4, L5

	method.					
17cv52.8	Student should be able to determine the moments in frames subjected to sway or non sway having constant moment of inertia or variable moment of inertia using Flexibility method.	05	Displacement formation of flexibility matrix	Black board	Internal assessment and Assignment	L2, L4, L5
17cv52.9	Student should be able to determine the moments in indeterminate beams with or without sinking having constant moment of inertia or variable moment of inertia using Stiffness method.	05	Rotation formation of stiffness matrix	Black board	Internal assessment and Assignment	L2, L4, L5
17cv52.10	Student should be able to determine the moments in frames subjected to sway or non sway having constant moment of inertia or variable moment of inertia using Stiffness method.	05	Rotation formation of stiffness matrix	Black board	Internal assessment and Assignment	L2, L4, L5
-	**Total**	**50**	-	-	-	-

Note: Identify a max of 2 Concepts per Module. Write 1 CO per concept.

2. Course Applications

SNo	Application Area	CO	Level
1	Used for the design of Reinforced cement concrete, Pre stressed concrete, steel and Marine structures.	CO1 CO2	L5
2	Used for the design of Reinforced cement concrete, Pre stressed concrete, steel and Marine structures.	CO3 CO4	L5
3	Used for the design of Reinforced cement concrete, Pre stressed concrete, steel and Marine structures.	CO5 CO6	L5
4	Used for the design of Reinforced cement concrete, Pre stressed concrete, steel and Marine structures.	CO7 CO8	L5
5	Used for the design of Reinforced cement concrete, Pre stressed concrete, steel and Marine structures.	CO9 CO10	L5

Note: Write 1 or 2 applications per CO.

3. Articulation Matrix

(CO – PO MAPPING)

-	Course Outcomes	Program Outcomes												
#	COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	Level
17cv52.1	Student should be able to determine the moments in indeterminate beams with or without sinking having constant moment of inertia or variable moment of inertia using slope deflection method.	1	3	-	-	-	-	-	-	-	-	-	-	L5
17cv52.2	Student should be able to determine the moments in frames subjected to sway or non sway having constant moment of	1	3	-	-	-	-	-	-	-	-	-	-	L5

	inertia or variable moment of inertia using slope deflection method.													
17cv52.3	Student should be able to determine the moments in indeterminate beams with or without sinking having constant moment of inertia or variable moment of inertia using moment distribution method.	1	3	-	-	-	-	-	-	-	-	-	-	L5
17cv52.4	Student should be able to determine the moments in frames subjected to sway or non sway having constant moment of inertia or variable moment of inertia using moment distribution method.	1	3	-	-	-	-	-	-	-	-	-	-	L5
17cv52.5	Student should be able to determine the moments in indeterminate beams with or without sinking having constant moment of inertia or variable moment of inertia using Kani's method.	1	3	-	-	-	-	-	-	-	-	-	-	L5
17cv52.6	Student should be able to determine the moments in frames subjected to sway or non sway having constant moment of inertia or variable moment of inertia using Kani's method.	1	3	-	-	-	-	-	-	-	-	-	-	L5
17cv52.7	Student should be able to determine the moments in indeterminate beams with or without sinking having constant moment of inertia or variable moment of inertia using Flexibility method.	1	3	-	-	-	-	-	-	-	-	-	-	L5
17cv52.8	Student should be able to determine the moments in frames subjected to sway or non sway having constant moment of inertia or variable moment of inertia using Flexibility method.	1	3	-	-	-	-	-	-	-	-	-	-	L5
17cv52.9	Student should be able to determine the moments in indeterminate beams with or without sinking having constant moment of inertia or variable moment of inertia using Stiffness method.	1	3	-	-	-	-	-	-	-	-	-	-	L5
17cv52.10	Student should be able to determine the moments in frames subjected to sway or non	1	3	-	-	-	-	-	-	-	-	-	-	L5

	sway having constant moment of inertia or variable moment of inertia using Stiffness method.													
CV52PC.	Average	**1**	**3**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
Note: Mention the mapping strength as 1, 2, or 3														

4. Mapping Justification

Mapping		Justification	Mapping Level
CO	**PO**	**-**	**-**
CO1	PO1	Knowledge of Final moments is required for analysis of an structure	L5
CO1	PO2	Analysis of beam by Slope deflection method is required to calculate the final bending moments of members.	L5
CO2	PO1	Knowledge of Final moments is required for analysis of an structure	L5
CO2	PO2	Analysis of frames by Slope deflection method is required to calculate the final bending moments of members.	L5
CO3	PO1	Knowledge of Final moments is required for analysis of an structure	L5
CO3	PO2	Analysis of beam and truss by Moment distribution method is required to calculate the final bending moments of members.	L5
CO4	PO1	Knowledge of Final moments is required for analysis of an structure	L5
CO4	PO2	Analysis of frames by Moment distribution is required to calculate the final bending moments of members.	L5
CO5	PO1	Knowledge of Final moments is required for analysis of an structure	L5
CO5	PO2	Analysis of beam by kani's method is required to calculate the final bending moments of members.	L5
CO6	PO1	Knowledge of Final moments is required for analysis of an structure	L5
CO6	PO2	Analysis of frames by kani's method method is required to calculate the final bending moments of members.	L5
CO7	PO1	Knowledge of Final moments is required for analysis of an structure	L5
CO7	PO2	Analysis of Beams by Flexibility Matrix method is required to calculate the final bending moments of members.	L5
CO8	PO1	Knowledge of Final moments is required for analysis of an structure	L5
CO8	PO2	Analysis of frames by Flexibility Matrix method is required to calculate the final bending moments of members.	L5
CO9	PO1	Knowledge of Final moments is required for analysis of an structure	L5
CO9	PO2	Analysis of beam by Stiffness Matrix method is required to calculate the final bending moments of members.	L5
CO10	PO1	Knowledge of Final moments is required for analysis of an structure	L5
CO10	PO2	Analysis of frame by Stiffness Matrix method is required to calculate the final bending moments of members.	L5

Note: Write justification for each CO-PO mapping.

5. Curricular Gap and Content

SNo	Gap Topic	Actions Planned	Schedule Planned	Resources Person	PO Mapping
1					
2					
3					
4					
5					

Note: Write Gap topics from A.4 and add others also.

6. Content Beyond Syllabus

SNo	Gap Topic	Actions Planned	Schedule Planned	Resources Person	PO Mapping
1					
2					
3					
4					
5					
6					
7					
8					
9					
10					

Note: Anything not covered above is included here.

C. COURSE ASSESSMENT

1. Course Coverage

Module #	Title	Teaching Hours	No. of question in Exam						CO	Levels
			CIA-1	CIA-2	CIA-3	Asg	Extra Asg	SEE		
1	Slope deflection method	10	2	-	-	1	1	2	CO1 CO2	L5
2	Moment Distribution method	10	2	-	-	1	1	2	CO3 CO4	L5
3	Kani's method	10	-	2	-	1	1	2	CO5 CO6	L5
4	Flexibility matrix method	10	-	2	-	1	1	2	CO7 CO8	L5
5	Stiffness matrix method	10	-	-	4	1	1	2	CO9 CO10	L5
-	**Total**	**50**	**4**	**4**	**4**	**5**	**5**	**10**	**-**	**-**

Note: Distinct assignment for each student. 1 Assignment per chapter per student. 1 seminar per test per student.

2. Continuous Internal Assessment (CIA)

Evaluation	Weightage in Marks	CO	Levels
CIA Exam – 1	30	CO1, CO2, CO3, CO4	L5
CIA Exam – 2	30	CO5,CO6,CO7,CO8	L5
CIA Exam – 3	30	CO9,CO10	L5
Assignment - 1	10	CO1, CO2, CO3, CO4	L5
Assignment - 2	10	CO5,CO6,CO7,CO8	L5
Assignment - 3	10	CO9,CO10	L5
Final CIA Marks	**40**	**-**	**-**

Note : Blooms Level in last column shall match with A.2 above.

D1. TEACHING PLAN - 1

Module - 1

Title:	Slope deflection method	Appr Time:	10 Hrs
a	***Course Outcomes***	-	**Blooms**
-	The student should be able to:	-	**Level**

1	determine the moments in indeterminate beams with or without sinking having constant moment of inertia or variable moment of inertia using slope deflection method.	CO1	L2, L4, L5
2	determine the moments in frames subjected to sway or non sway having constant moment of inertia or variable moment of inertia using slope deflection method.	CO2	L2, L4, L5
b	***Course Schedule***	-	-
Class No	**Module Content Covered**	**CO**	**Level**
1	Slope Deflection Method: Introduction	C01	L2
2	sign convention,	C01	L2
3	development of slope deflection equation	C01	L4
4	analysis of continuous beams including settlements	C01	L4
5	Analysis of orthogonal rigid plane frames including sway frames with kinematic indeterminacy ≤ 3	C01	L5
6	Problems	C01	L5
7	Problems	C01	L5
8	Problems	C02	L5
9	Problems	C02	L5
10	Problems	C02	L5
		C02	L5
c	Application Areas	**CO**	**Level**
1	Used for the design of Reinforced cement concrete, Pre stressed concrete, steel and Marine structures.	CO1	L5
d	Review Questions	-	-
1	Analyse the continuous beam by Slope Deflection method and Draw SFD and BMD	CO1	L5
2	Analyse the Portal frame by Slope Deflection method and Draw SFD and BMD	CO1	L5
e	Experiences	-	-
1			
2			

Module – 2

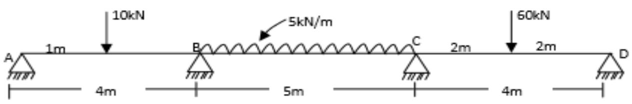
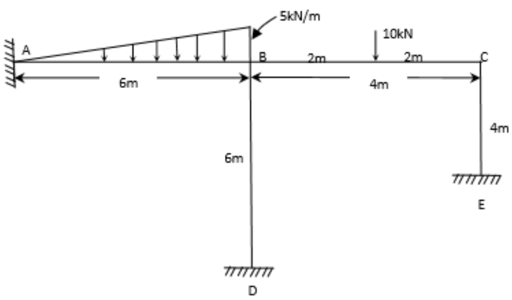
Title:	Moment distribution method	Appr Time:	10 Hrs
a	***Course Outcomes***	-	**Blooms**
-	The student should be able to:	-	**Level**
1	Student should be able to determine the moments in indeterminate beams with or without sinking having constant moment of inertia or variable moment of inertia using moment distribution method.	CO3	L2, L4, L5
2	Student should be able to determine the moments in frames subjected to sway or non sway having constant moment of inertia or variable moment of inertia using moment distribution method.	CO4	L2, L4, L5
b	***Course Schedule***	-	-
Class No	**Module Content Covered**	**CO**	**Level**

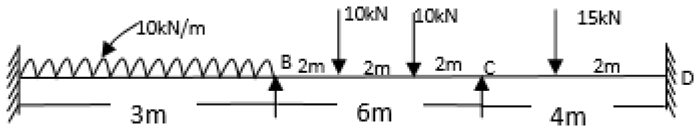
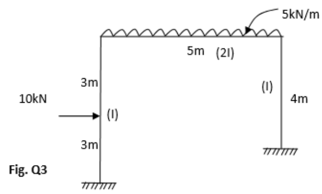
11	**Moment Distribution Method:** Introduction	CO3	L2
12	Definition of terms, Development of method	CO3	L2
13	Analysis of continuous beams with support yielding	C03	L4
14	Analysis of orthogonal rigid plane frames including sway frames with kinematic indeterminacy ≤ 3	C03	L4
15	Analysis of orthogonal rigid plane frames including sway frames with kinematic indeterminacy ≤ 3	C04	L5
16	Numericals	C04	L5
17	Numericals	C04	L5
18	Numericals	C04	L5
19	Numericals	C04	L5
20	Numericals	C04	L5
c	**Application Areas**	**CO**	**Level**
1	Used for the design of Reinforced cement concrete, Pre stressed concrete, steel and Marine structures.	CO3	L5
2	Used for the design of Reinforced cement concrete, Pre stressed concrete, steel and Marine structures.	CO4	L5
d	**Review Questions**	-	-
1	Analyse the continuous beam by moment distribution method and Draw SFD and BMD	CO3	L5
2	Analyse the Portal frame by moment distribution method and Draw SFD and BMD	CO4	L5
e	**Experiences**	-	-
1			
2			

E1. CIA EXAM – 1

a. Model Question Paper - 1

Crs Code:	17cv52	Sem:	V	Marks:	30	Time:	75 minutes
Course:	Analysis of Indeterminate Structures						

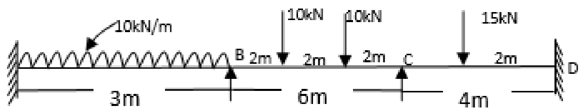
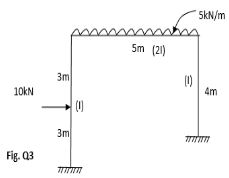
-	**-**	**Note: Answer any 3 questions, each carry equal marks.**	**Marks**	**CO**	**Level**
1		Analyse the continuous beam by Slope Deflection method and Draw SFD and BMD.  Fig. Q.1	15	CO1	L5
		OR			
2		Analyse the Portal frame by Slope Deflection method and Draw SFD and BMD  Fig. Q.2	15	CO2	L5

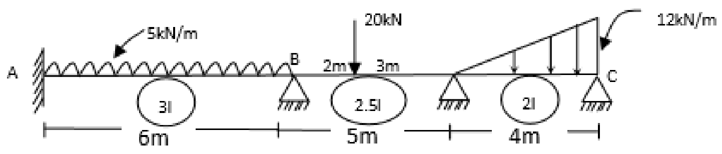
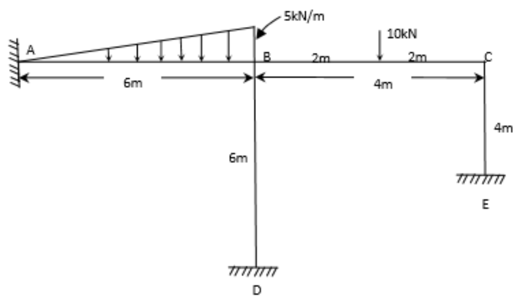
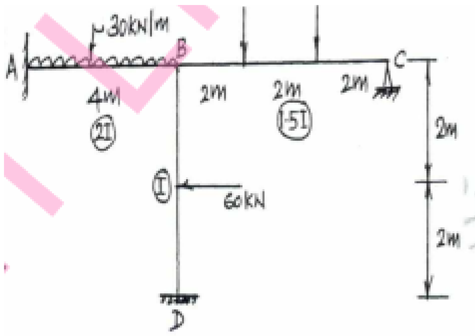
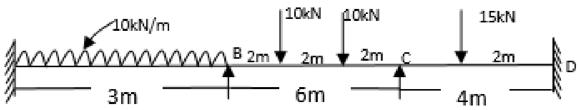
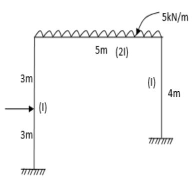
3		Analyse the continuous beam by moment distribution method and Draw SFD and BMD  Fig.Q4	15	CO3	L5
		OR			
4		Analyse the Portal frame by moment distribution method and Draw SFD and BMD 	15	CO4	L5

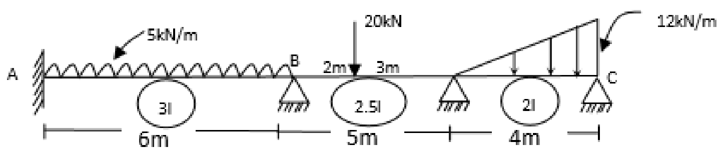
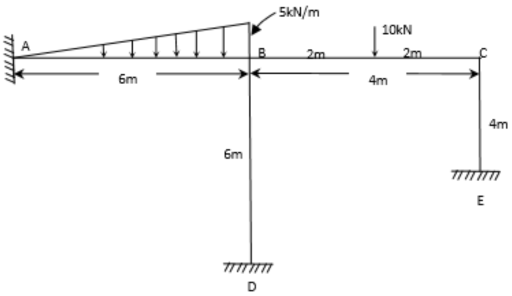
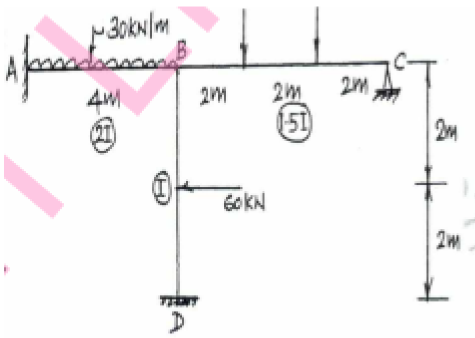
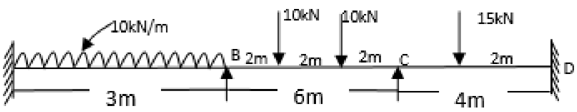
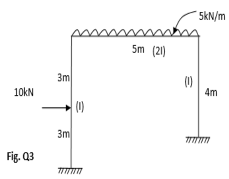
b. Assignment -1

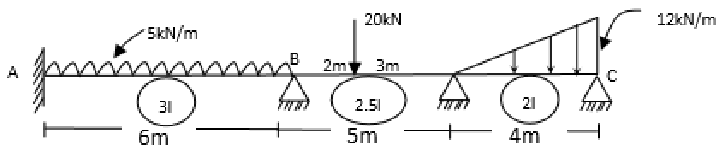
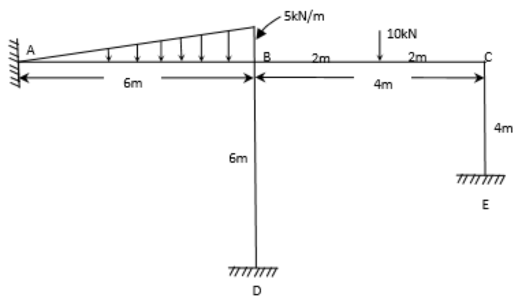
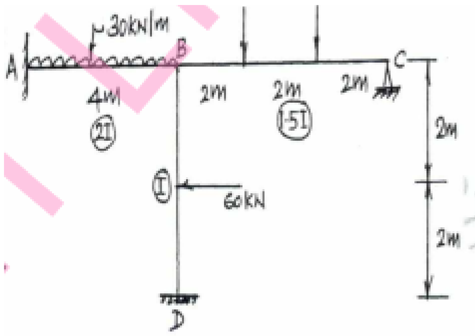
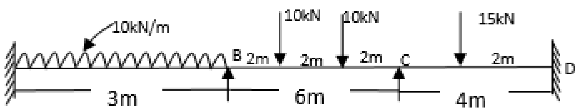
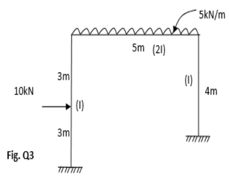
Note: A distinct assignment to be assigned to each student.

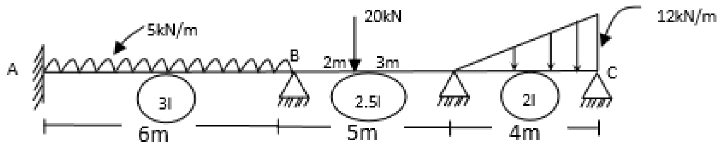
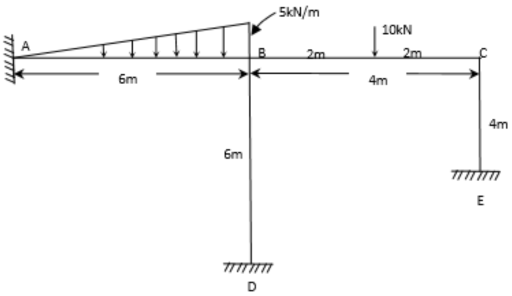
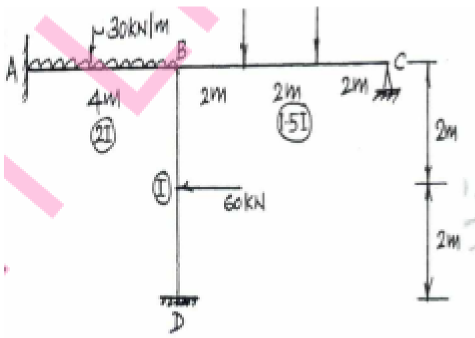
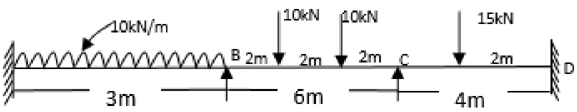
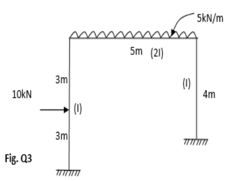
Model Assignment Questions							
Crs Code:	17CV52	Sem:	V	Marks:	15	Time:	90 – 120 minutes
Course:	Analysis of Indeterminate Structures						
Note: Each student to answer 2-3 assignments. Each assignment carries equal mark.							

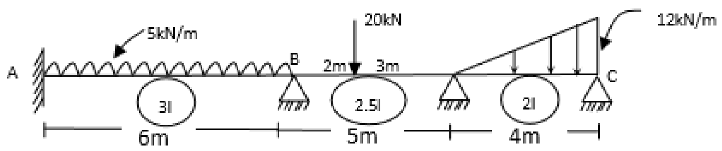
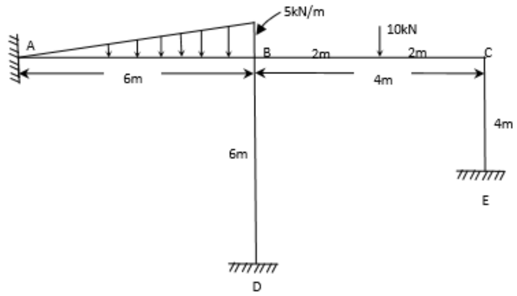
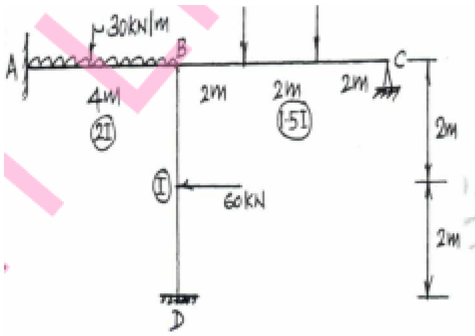
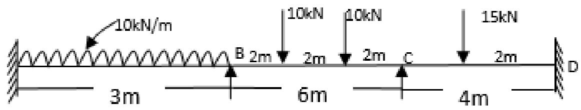
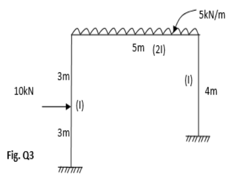
SNo	USN	Assignment Description	Marks	CO	Level
1		Analyse the continuous beam by Slope Deflection method and Draw SFD and BMD. 	15	CO1	L5
2		Analyse the Portal frame by Slope Deflection method and Draw SFD and BMD. 	15	CO2	L5
3		Analyse the continuous beam by moment distribution method and Draw SFD and BMD	15	CO3	L5

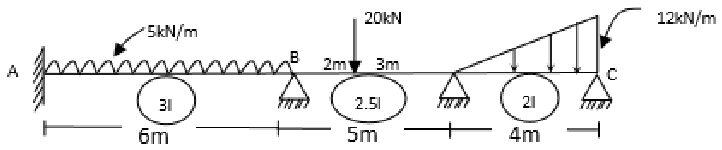
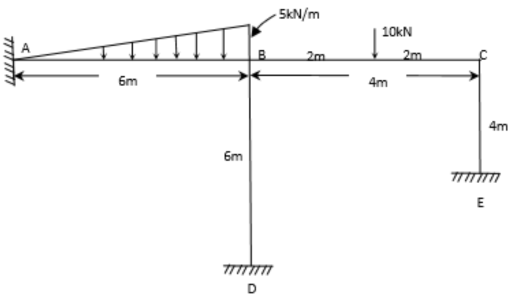
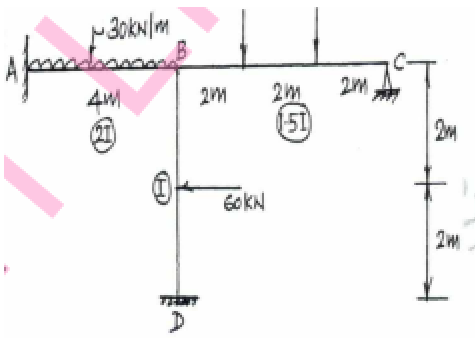
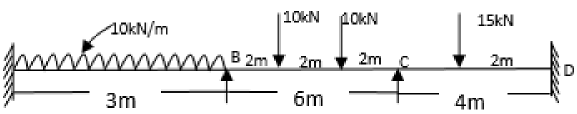
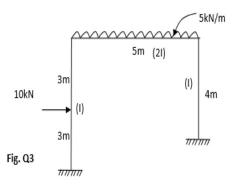
					
4		Analyse the Portal frame by moment distribution method and Draw SFD and BMD 	15	CO4	L5
5		Analyze the frame shown in using slope deflection method. Draw BMD. 	5	CO1	L5
6		Analyse the continuous beam by Slope Deflection method and Draw SFD and BMD. 	15	CO1	L5
7		Analyse the Portal frame by Slope Deflection method and Draw SFD and BMD.  Fig. Q3	15	CO2	L5

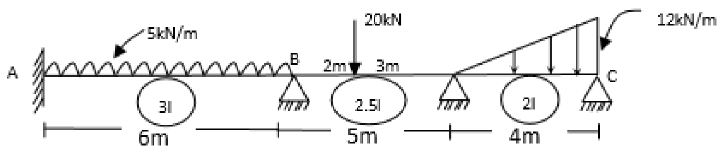
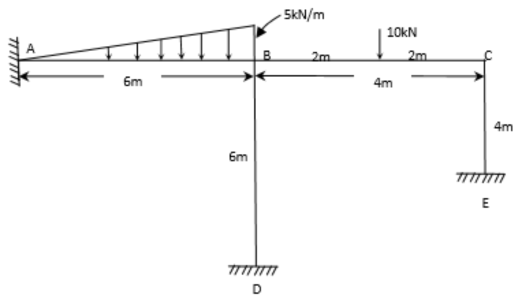
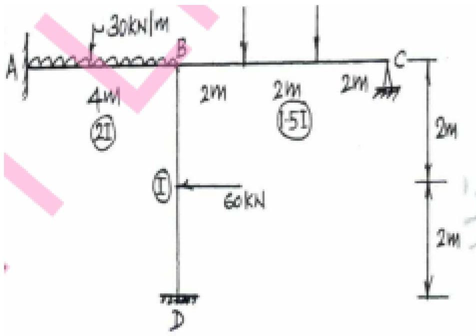
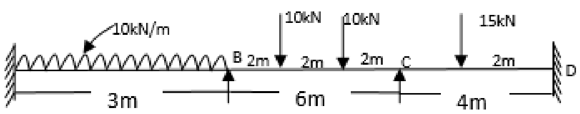
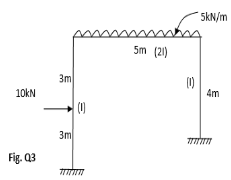
8		Analyse the continuous beam by moment distribution method and Draw SFD and BMD  	15	CO3	L5
9		Analyse the Portal frame by moment distribution method and Draw SFD and BMD  	15	CO4	L5
10		Analyze the frame shown in using slope deflection method. Draw BMD.  	5	CO1	L5
11		Analyse the continuous beam by Slope Deflection method and Draw SFD and BMD.  	15	CO1	L5
12		Analyse the Portal frame by Slope Deflection method and Draw SFD and BMD.  	15	CO2	L5
13		Analyse the continuous beam by moment distribution method and Draw SFD and BMD	15	CO3	L5

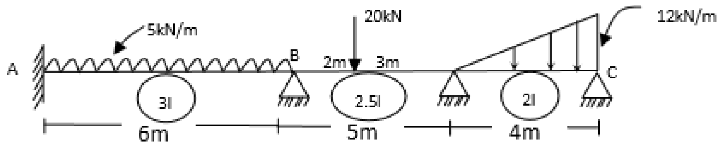
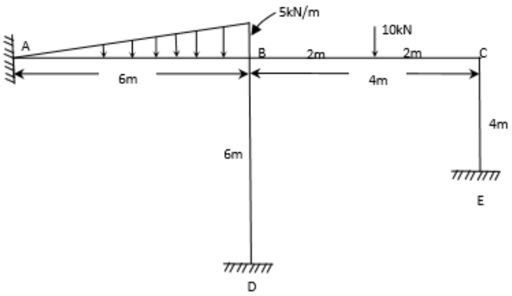
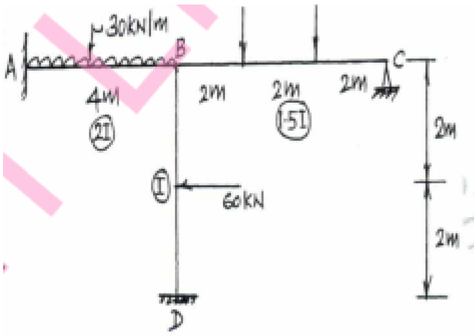
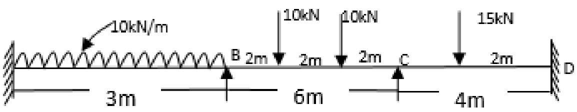
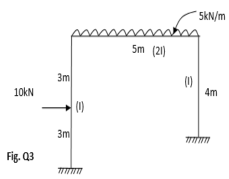
					
14		Analyse the Portal frame by moment distribution method and Draw SFD and BMD 	15	CO4	L5
15		Analyze the frame shown in using slope deflection method. Draw BMD. 	5	CO1	L5
16		Analyse the continuous beam by Slope Deflection method and Draw SFD and BMD. 	15	CO1	L5
17		Analyse the Portal frame by Slope Deflection method and Draw SFD and BMD. 	15	CO2	L5

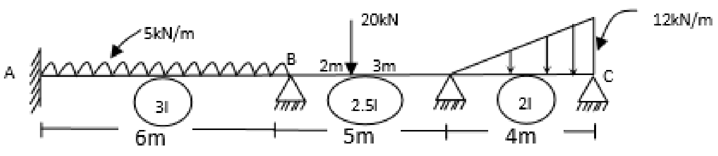
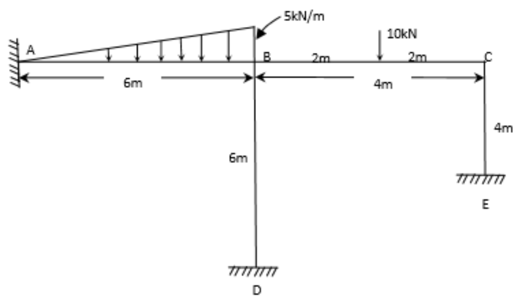
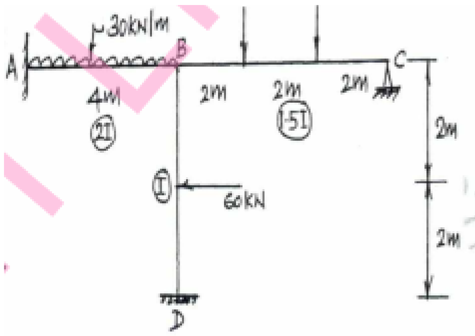
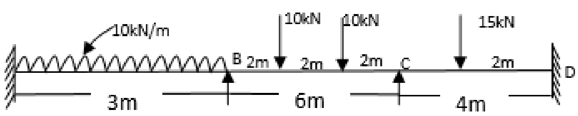
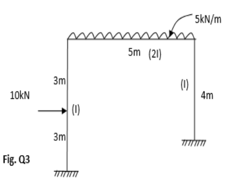
18		Analyse the continuous beam by moment distribution method and Draw SFD and BMD 	15	CO3	L5
19		Analyse the Portal frame by moment distribution method and Draw SFD and BMD 	15	CO4	L5
20		Analyze the frame shown in using slope deflection method. Draw BMD. 	5	CO1	L5
21		Analyse the continuous beam by Slope Deflection method and Draw SFD and BMD. 	15	CO1	L5
22		Analyse the Portal frame by Slope Deflection method and Draw SFD and BMD. 	15	CO2	L5
23		Analyse the continuous beam by moment distribution method and Draw SFD and BMD	15	CO3	L5

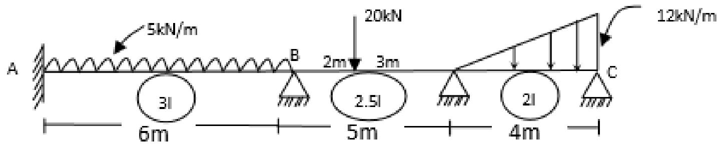
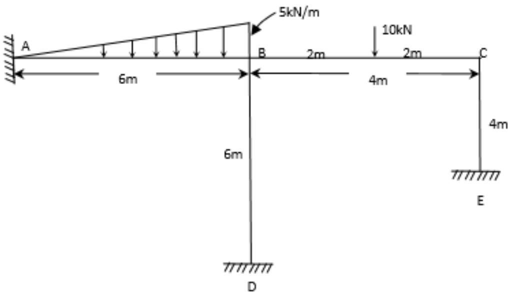
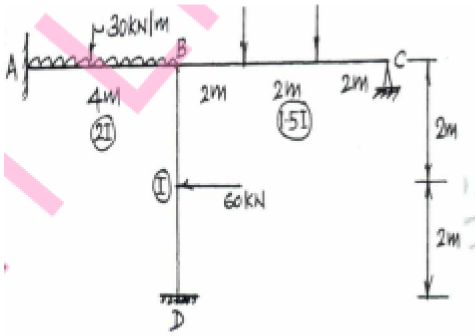
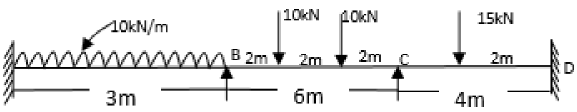
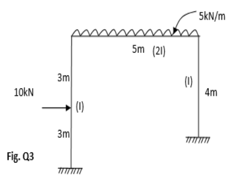
					
24		Analyse the Portal frame by moment distribution method and Draw SFD and BMD 	15	CO4	L5
25		Analyze the frame shown in using slope deflection method. Draw BMD. 	5	CO1	L5
26		Analyse the continuous beam by Slope Deflection method and Draw SFD and BMD. 	15	CO1	L5
27		Analyse the Portal frame by Slope Deflection method and Draw SFD and BMD. 	15	CO2	L5

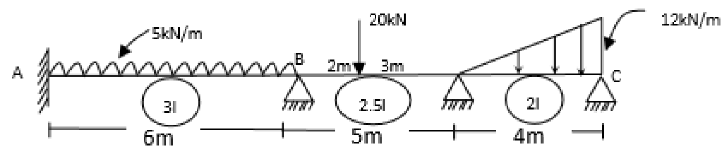
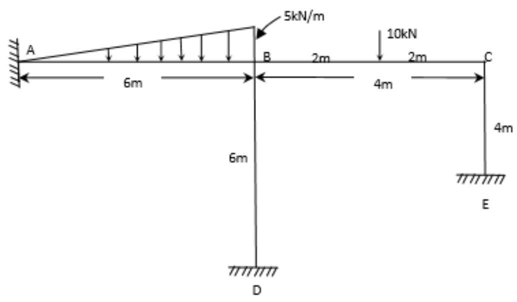
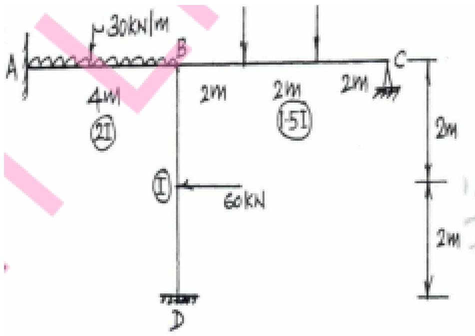
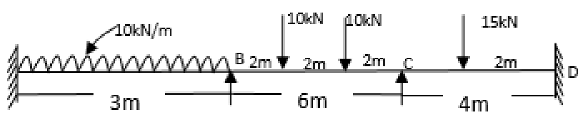
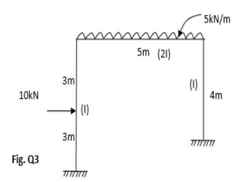
28		Analyse the continuous beam by moment distribution method and Draw SFD and BMD  	15	CO3	L5
29		Analyse the Portal frame by moment distribution method and Draw SFD and BMD  	15	CO4	L5
39		Analyze the frame shown in using slope deflection method. Draw BMD.  	5	CO1	L5
31		Analyse the continuous beam by Slope Deflection method and Draw SFD and BMD.  	15	CO1	L5
32		Analyse the Portal frame by Slope Deflection method and Draw SFD and BMD.  	15	CO2	L5
33		Analyse the continuous beam by moment distribution method and Draw SFD and BMD	15	CO3	L5

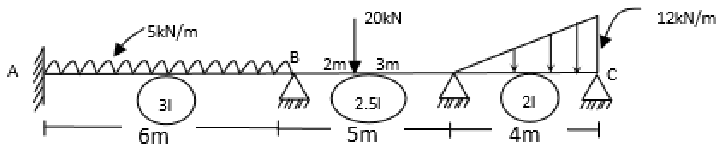
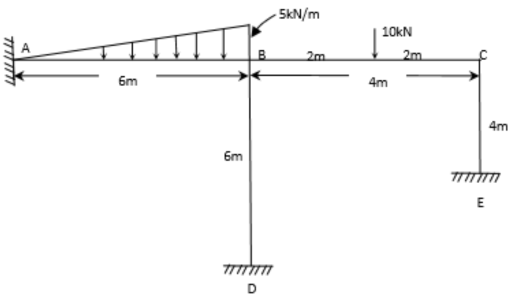
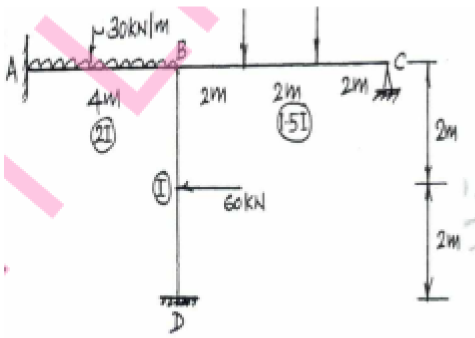
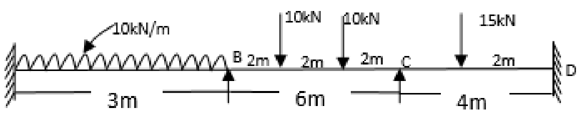
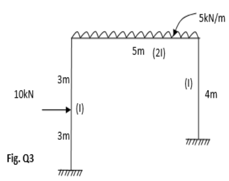
					
34		Analyse the Portal frame by moment distribution method and Draw SFD and BMD 	15	CO4	L5
35		Analyze the frame shown in using slope deflection method. Draw BMD. 	5	CO1	L5
36		Analyse the continuous beam by Slope Deflection method and Draw SFD and BMD. 	15	CO1	L5
37		Analyse the Portal frame by Slope Deflection method and Draw SFD and BMD. 	15	CO2	L5

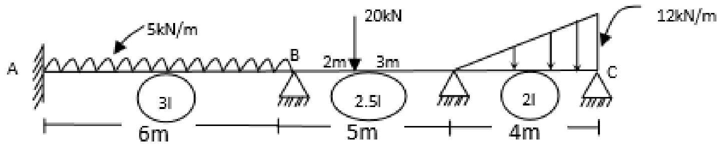
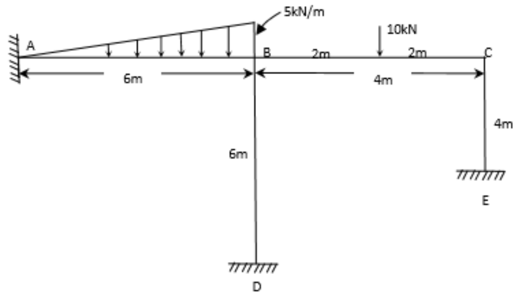
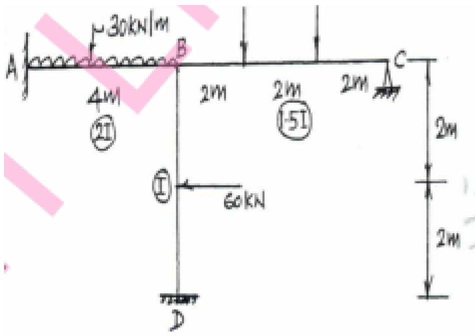
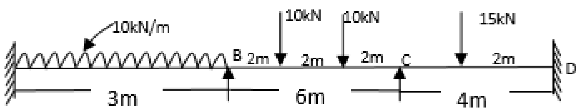
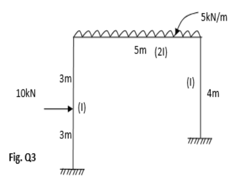
38		Analyse the continuous beam by moment distribution method and Draw SFD and BMD 	15	CO3	L5
39		Analyse the Portal frame by moment distribution method and Draw SFD and BMD 	15	CO4	L5
40		Analyze the frame shown in using slope deflection method. Draw BMD. 	5	CO1	L5
41		Analyse the continuous beam by Slope Deflection method and Draw SFD and BMD. 	15	CO1	L5
42		Analyse the Portal frame by Slope Deflection method and Draw SFD and BMD. 	15	CO2	L5
43		Analyse the continuous beam by moment distribution method and Draw SFD and BMD	15	CO3	L5

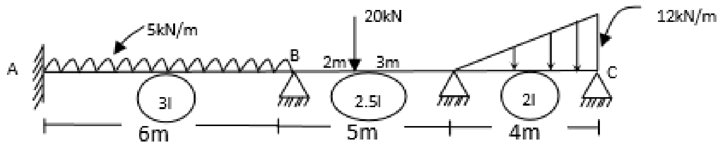
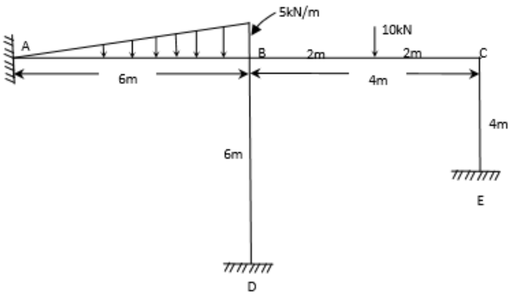
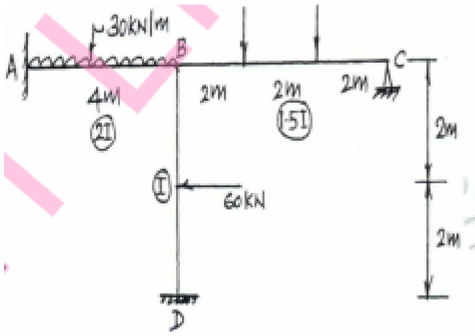
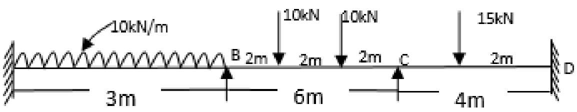
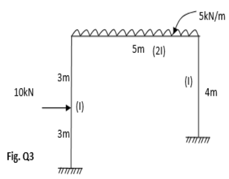
					
44		Analyse the Portal frame by moment distribution method and Draw SFD and BMD 	15	CO4	L5
45		Analyze the frame shown in using slope deflection method. Draw BMD. 	5	CO1	L5
46		Analyse the continuous beam by Slope Deflection method and Draw SFD and BMD. 	15	CO1	L5
47		Analyse the Portal frame by Slope Deflection method and Draw SFD and BMD.  Fig. Q3	15	CO2	L5

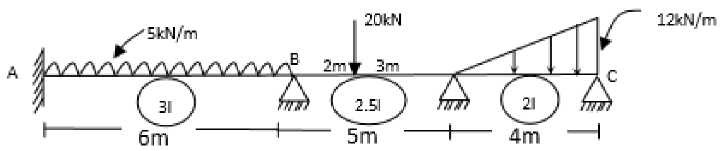
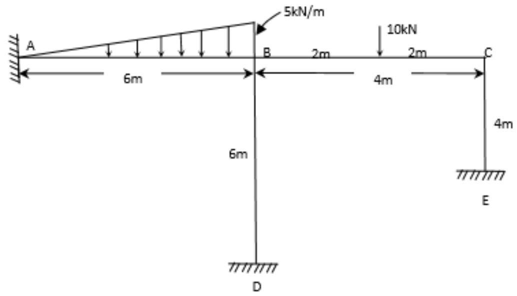
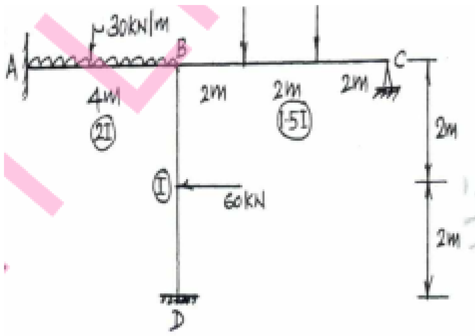
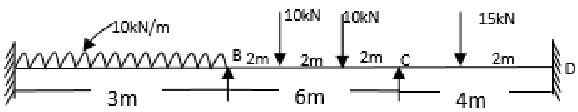
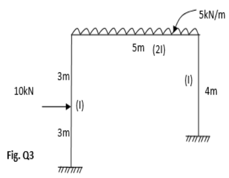
48		Analyse the continuous beam by moment distribution method and Draw SFD and BMD 	15	CO3	L5
49		Analyse the Portal frame by moment distribution method and Draw SFD and BMD 	15	CO4	L5
50		Analyze the frame shown in using slope deflection method. Draw BMD. 	5	CO1	L5
51		Analyse the continuous beam by Slope Deflection method and Draw SFD and BMD. 	15	CO1	L5
52		Analyse the Portal frame by Slope Deflection method and Draw SFD and BMD. 	15	CO2	L5
53		Analyse the continuous beam by moment distribution method and Draw SFD and BMD	15	CO3	L5

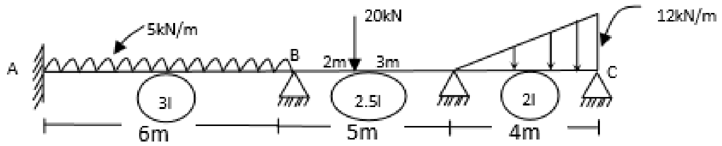
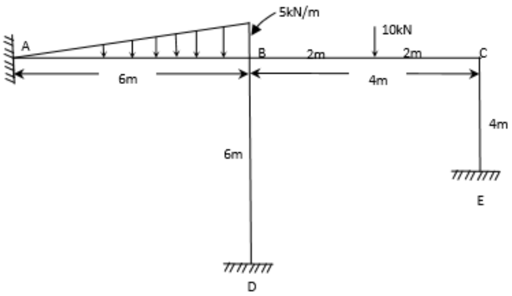
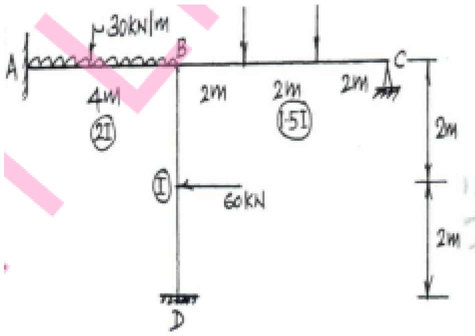
					
54		Analyse the Portal frame by moment distribution method and Draw SFD and BMD 	15	CO4	L5
55		Analyze the frame shown in using slope deflection method. Draw BMD. 	5	CO1	L5
56		Analyse the continuous beam by Slope Deflection method and Draw SFD and BMD. 	15	CO1	L5
57		Analyse the Portal frame by Slope Deflection method and Draw SFD and BMD. 	15	CO2	L5

58		Analyse the continuous beam by moment distribution method and Draw SFD and BMD 	15	CO3	L5
59		Analyse the Portal frame by moment distribution method and Draw SFD and BMD 	15	CO4	L5
60		Analyze the frame shown in using slope deflection method. Draw BMD. 	5	CO1	L5
61		Analyse the continuous beam by Slope Deflection method and Draw SFD and BMD. 	15	CO1	L5
62		Analyse the Portal frame by Slope Deflection method and Draw SFD and BMD. 	15	CO2	L5
63		Analyse the continuous beam by moment distribution method and Draw SFD and BMD	15	CO3	L5

					
64		Analyse the Portal frame by moment distribution method and Draw SFD and BMD 	15	CO4	L5
65		Analyze the frame shown in using slope deflection method. Draw BMD. 	5	CO1	L5
66		Analyse the continuous beam by Slope Deflection method and Draw SFD and BMD. 	15	CO1	L5
67		Analyse the Portal frame by Slope Deflection method and Draw SFD and BMD. 	15	CO2	L5

68		Analyse the continuous beam by moment distribution method and Draw SFD and BMD 	15	CO3	L5
69		Analyse the Portal frame by moment distribution method and Draw SFD and BMD 	15	CO4	L5
70		Analyze the frame shown in using slope deflection method. Draw BMD. 	5	CO1	L5
71		Analyse the continuous beam by Slope Deflection method and Draw SFD and BMD. 	15	CO1	L5
72		Analyse the Portal frame by Slope Deflection method and Draw SFD and BMD. 	15	CO2	L5
73		Analyse the continuous beam by moment distribution method and Draw SFD and BMD	15	CO3	L5

					
74		Analyse the Portal frame by moment distribution method and Draw SFD and BMD 	15	CO4	L5
75		Analyze the frame shown in using slope deflection method. Draw BMD. 	5	CO1	L5
76		Analyse the continuous beam by Slope Deflection method and Draw SFD and BMD. 	15	CO1	L5
77		Analyse the Portal frame by Slope Deflection method and Draw SFD and BMD. 	15	CO2	L5

78		Analyse the continuous beam by moment distribution method and Draw SFD and BMD 	15	CO3	L5
79		Analyse the Portal frame by moment distribution method and Draw SFD and BMD 	15	CO4	L5
80		Analyze the frame shown in using slope deflection method. Draw BMD. 	5	CO1	L5

D2. TEACHING PLAN - 2`

Module – 3

Title:	Kani's method	Appr Time:	10 Hrs
a	***Course Outcomes***	-	**Blooms**
-	The student should be able to:	-	**Level**
1	determine the moments in indeterminate beams with or without sinking having constant moment of inertia or variable moment of inertia using Kani's method.	CO5	L2, L4 L5
2	determine the moments in frames subjected to sway or non sway having constant moment of inertia or variable moment of inertia using Kani's method.	CO6	L2, L4 L5
b	***Course Schedule***		
Class No	**Module Content Covered**	**CO**	**Level**
20	Kani's Method: Introduction	Co5	L2
21	Concept, Relationships between bending moment and deformations	Co5	L2
22	Analysis of continuous beams with and without settlements	Co5	L4
23	Analysis of frames with and without sway	Co5	L4
24	Numericals	Co5	L5
25	Numericals	Co5	L5

26	Numericals	C06	L5
27	Numericals	C06	L5
28	Numericals	C06	L5
29	Numericals	C06	L5
30	Numericals	C06	L5
c	**Application Areas**	**CO**	**Level**
1	Used for the design of Reinforced cement concrete, Pre stressed concrete, steel and Marine structures.	C05	L5
2	Used for the design of Reinforced cement concrete, Pre stressed concrete, steel and Marine structures.	C06	L5
d	**Review Questions**	-	-
1	Analyse the continuous beam by Kani's method and Draw SFD and BMD	C05	L5
2	Analyse the Portal frame by Kani's method and Draw SFD and BMD	C06	L5
e	**Experiences**	-	-
1			
2			

Module – 4

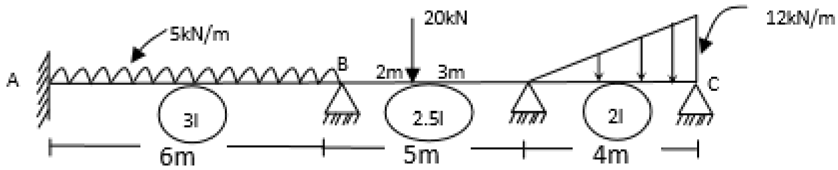
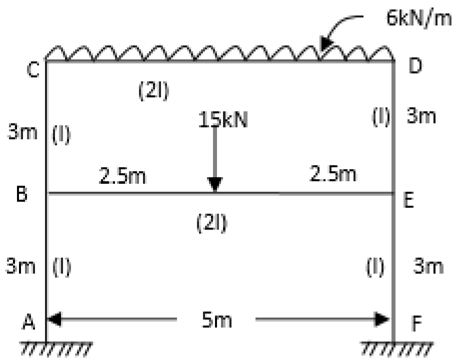
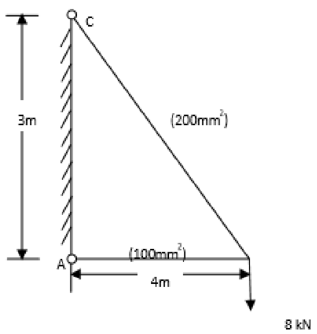
Title:	Matrix method of Analysis.(Stiffness matrix)	Appr Time:	10 Hrs
a	***Course Outcomes***	-	**Blooms**
-	The student should be able to:	-	**Level**
1	determine the moments in indeterminate beams with or without sinking having constant moment of inertia or variable moment of inertia using Stiffness method.	CO7	L2
2	determine the moments in frames subjected to sway or non sway having constant moment of inertia or variable moment of inertia using Stiffness method.	CO8	L2
b	***Course Schedule***		
Class No	**Module Content Covered**	**CO**	**Level**
31	Matrix Method of Analysis (Stiffness Method): Introduction	CO7	L2
32	Stiffness matrix	CO7	L2
33	Analysis of continuous beams and plane trusses using system approach	CO7	L2
34	Analysis of simple orthogonal rigid frames using system approach with kinematicndeterminacy ≤ 3	CO7	L4
35	Analysis of simple orthogonal rigid frames using system approach with kinematic Indeterminacy ≤ 3	CO8	L4
36	Problems	CO8	L4
37	Problems	CO8	L5
38	Problems	CO8	L5
39	Problems	CO8	L5
40	Problems	CO8	L5
c	**Application Areas**	**CO**	**Level**
1	Used for the design of Reinforced cement concrete, Pre stressed concrete, steel and Marine structures.	CO9	L5
2	Used for the design of Reinforced cement concrete, Pre stressed concrete, steel and Marine structures.	CO10	L5

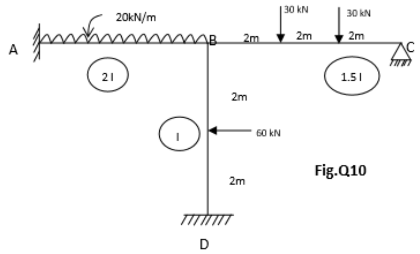
d	**Review Questions**	-	-
1	Analyse the continuous beam by Stiffness matrix method and Draw SFD and BMD	CO9	L5
2	Analyse the Portal frame by Stiffness matrix method and Draw SFD and BMD	CO10	L5
e	**Experiences**	-	-

E2. CIA EXAM – 2

a. Model Question Paper - 2

Crs Code:	17CV52	Sem:	V	Marks:	30	Time:	75 minutes
Course:	Analysis of Indeterminate Structures						

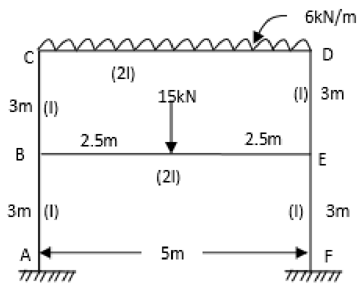
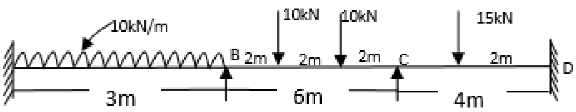
-	-	**Note: Answer any 2 questions, each carry equal marks.**	**Marks**	**CO**	**Level**
1		Analyse the continuous beam by Kani's method and Draw SFD and BMD 	15	CO5	L5
		OR			
2		Analyse the Portal frame by Kani's method and Draw SFD and BMD 	15	CO6	L5
3		Using stiffness method, determine forces in the members AB and BC of a pin jointed frame given in Fig. Q9. The cross sections are indicated in the brackets against each member. E = 2 x 105 N/mm2 	15	CO7	L5
		OR			

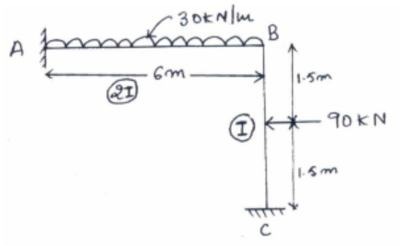
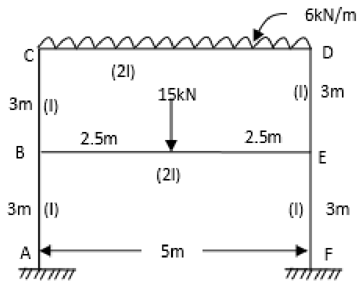
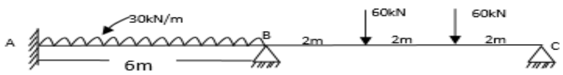
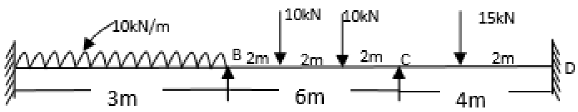
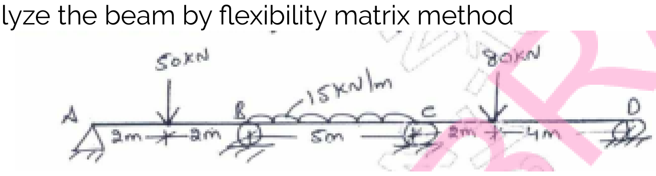
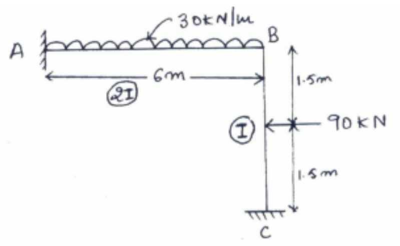
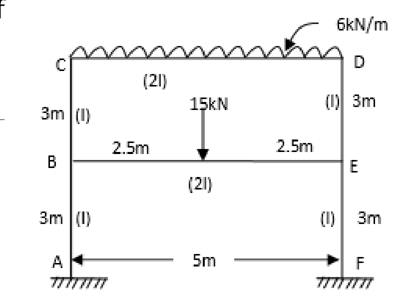
4		Analyze the frame shown in Fig. using stiffness method. Draw BMD  Fig.Q10	15	CO8	L5

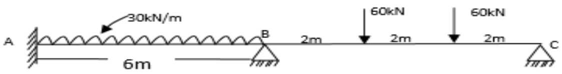
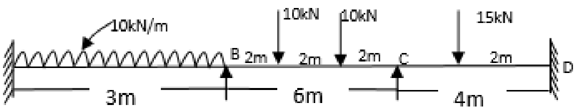
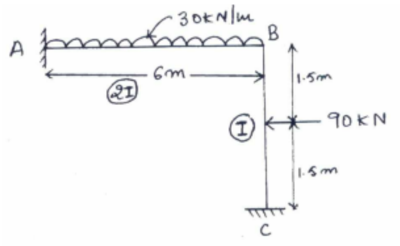
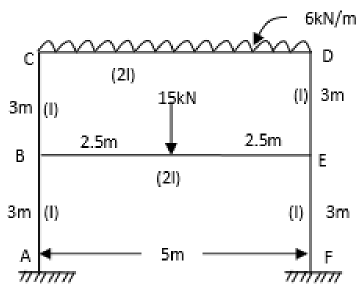
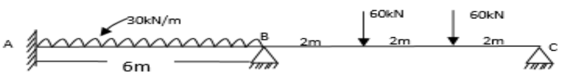
b. Assignment – 2

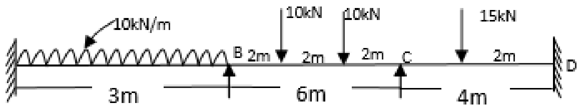
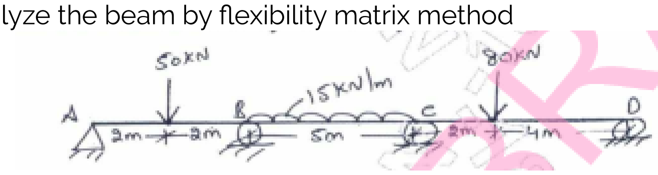
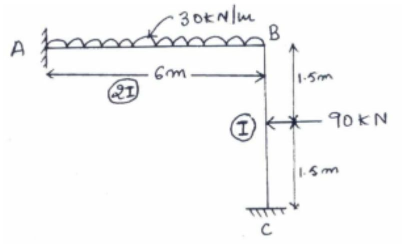
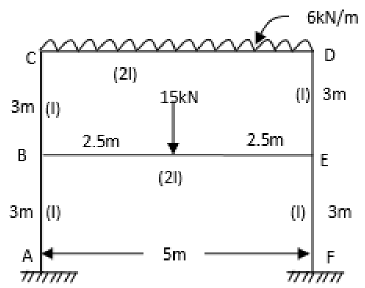
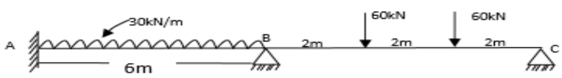
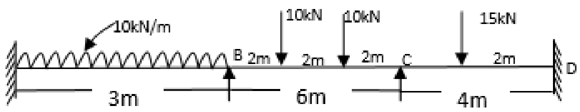
Note: A distinct assignment to be assigned to each student.

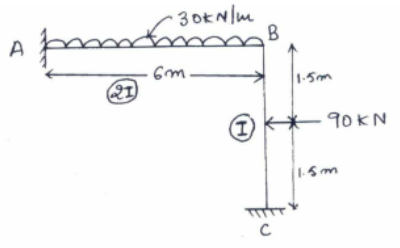
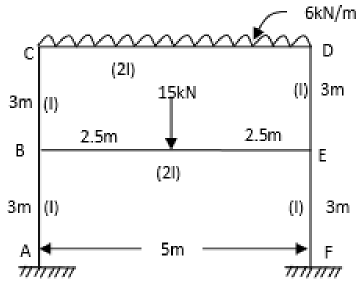
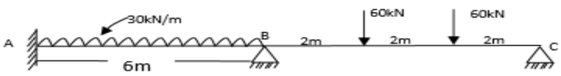
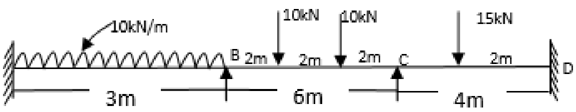
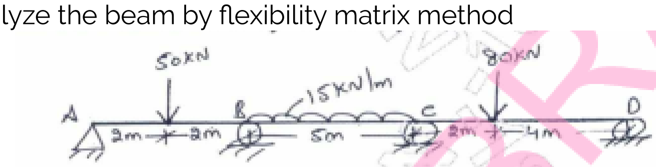
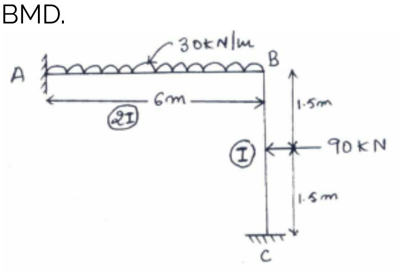
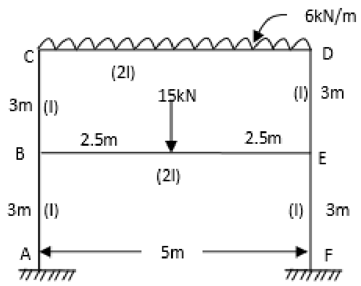
Model Assignment Questions							
Crs Code:	17CV52	Sem:	V	Marks:	15	Time:	90 – 120 minutes
Course:	Analysis of Indeterminate Structures						
Note: Each student to answer 2-3 assignments. Each assignment carries equal mark.							

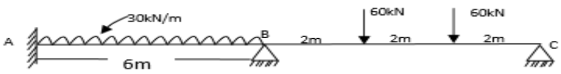
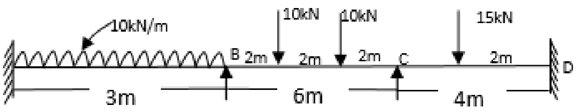
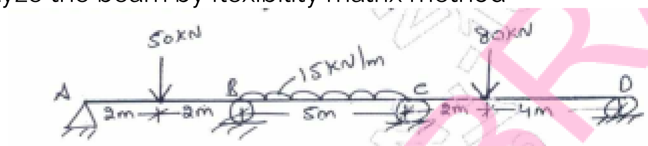
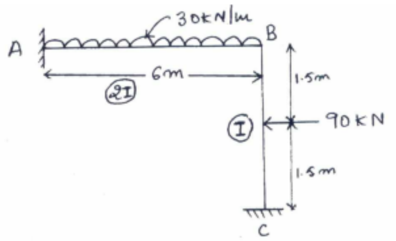
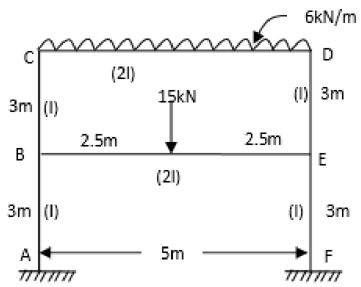
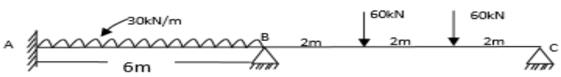
SNo	USN	Assignment Description	Marks	CO	Level
1		Analyze the frame shown in using Kani's method taking advantage of symmetry. Draw BMD . 	15	CO5	L5
2		Analyse the continuous beam by Kani's method and Draw SFD and BMD 	15	CO6	L5
3		Analyse the continuous beam by flexibility matrix method and Draw SFD and BMD. 	15	CO7	L5
4		Analyze the beam by flexibility matrix method 	15	CO7	L5

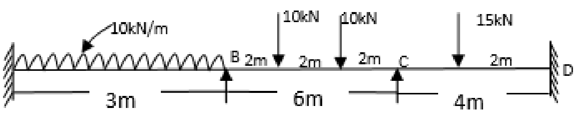
5		Analyze the portal frame shown in using flexibility method. Draw SFD and BMD. 	15	CO7	L5
6		Analyze the frame shown in using Kani's method taking advantage of symmetry. Draw BMD . 	15	CO5	L5
7		Analyse the continuous beam by Kani's method and Draw SFD and BMD 	15	CO6	L5
8		Analyse the continuous beam by flexibility matrix method and Draw SFD and BMD. 	15	CO7	L5
9		Analyze the beam by flexibility matrix method 	15	CO7	L5
10		Analyze the portal frame shown in using flexibility method. Draw SFD and BMD. 	15	CO7	L5
11		Analyze the frame shown in using Kani's method taking advantage of symmetry. Draw BMD . 	15	CO5	L5

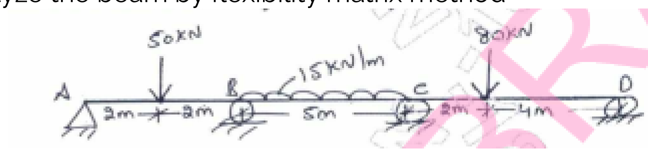
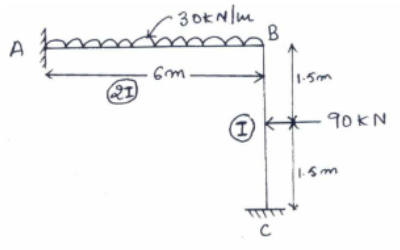
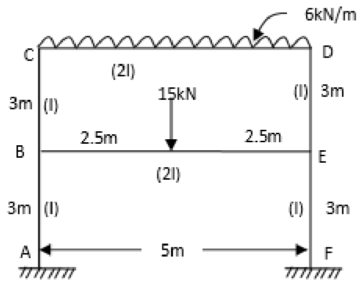
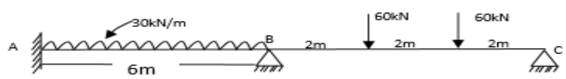
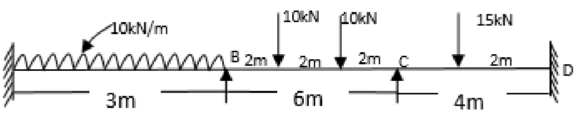
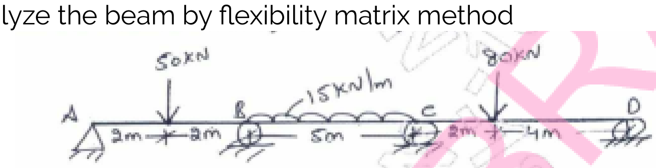
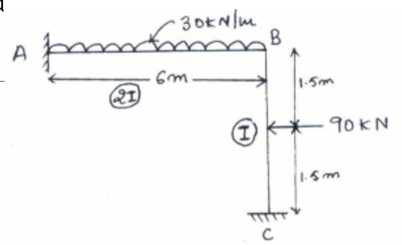
12		Analyse the continuous beam by Kani's method and Draw SFD and BMD  	15	CO6	L5
13		Analyse the continuous beam by flexibility matrix method and Draw SFD and BMD.  	15	CO7	L5
14		Analyze the beam by flexibility matrix method  	15	CO7	L5
15		Analyze the portal frame shown in using flexibility method. Draw SFD and BMD.  	15	CO7	L5
16		Analyze the frame shown in using Kani's method taking advantage of symmetry. Draw BMD .  	15	CO5	L5
17		Analyse the continuous beam by Kani's method and Draw SFD and BMD  	15	CO6	L5

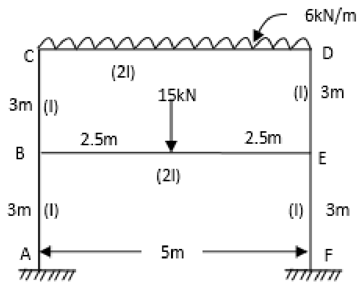
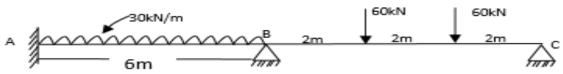
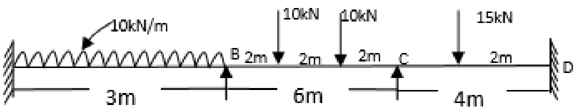
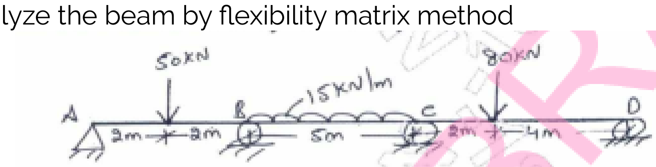
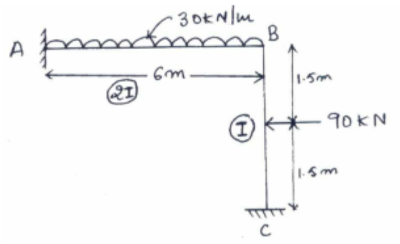
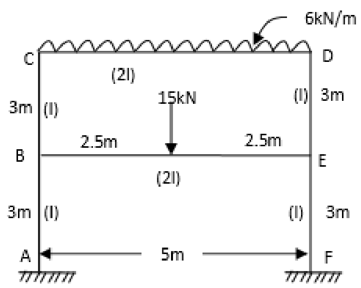
18		Analyse the continuous beam by flexibility matrix method and Draw SFD and BMD. 	15	CO7	L5
19		Analyze the beam by flexibility matrix method 	15	CO7	L5
20		Analyze the portal frame shown in using flexibility method. Draw SFD and BMD. 	15	CO7	L5
21		Analyze the frame shown in using Kani's method taking advantage of symmetry. Draw BMD . 	15	CO5	L5
22		Analyse the continuous beam by Kani's method and Draw SFD and BMD 	15	CO6	L5
23		Analyse the continuous beam by flexibility matrix method and Draw SFD and BMD. 	15	CO7	L5
24		Analyze the beam by flexibility matrix method 	15	CO7	L5
25		Analyze the portal frame shown in using flexibility method.	15	CO7	L5

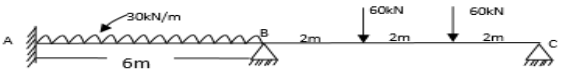
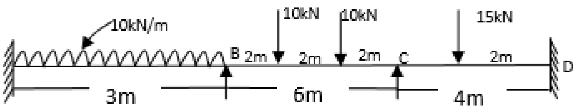
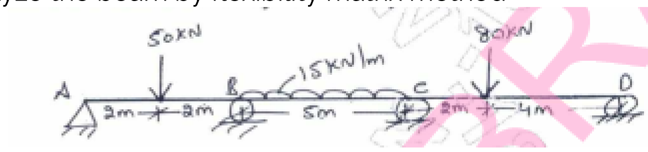
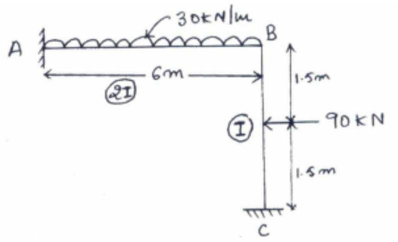
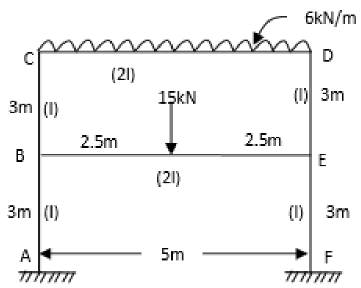
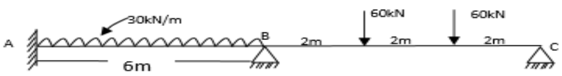
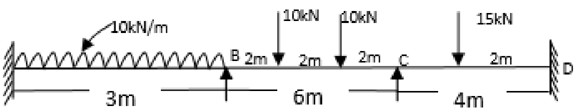
		Draw SFD and BMD. 			
26		Analyze the frame shown in using Kani's method taking advantage of symmetry. Draw BMD . 	15	CO5	L5
27		Analyse the continuous beam by Kani's method and Draw SFD and BMD 	15	CO6	L5
28		Analyse the continuous beam by flexibility matrix method and Draw SFD and BMD. 	15	CO7	L5
29		Analyze the beam by flexibility matrix method 	15	CO7	L5
39		Analyze the portal frame shown in using flexibility method. Draw SFD and BMD. 	15	CO7	L5
31		Analyze the frame shown in using Kani's method taking advantage of symmetry. Draw BMD . 	15	CO5	L5

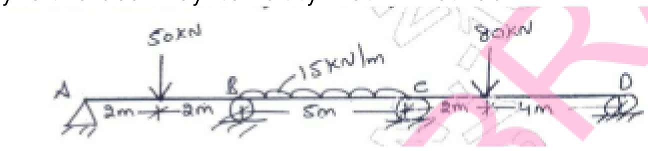
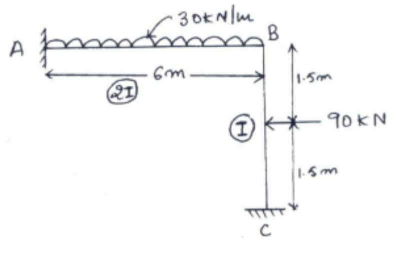
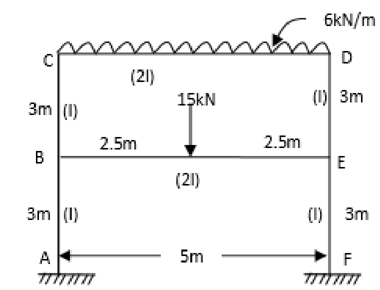
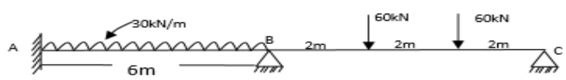
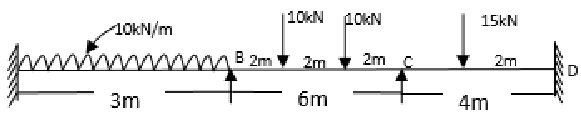
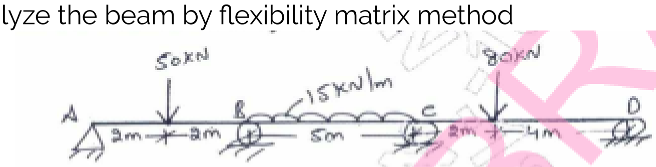
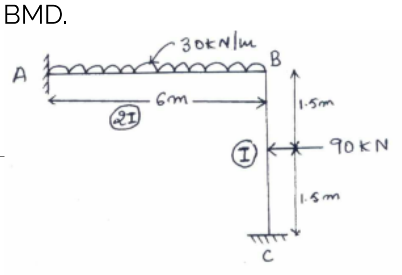
32		Analyse the continuous beam by Kani's method and Draw SFD and BMD 	15	CO6	L5
33		Analyse the continuous beam by flexibility matrix method and Draw SFD and BMD. 	15	CO7	L5
34		Analyze the beam by flexibility matrix method 	15	CO7	L5
35		Analyze the portal frame shown in using flexibility method. Draw SFD and BMD. 	15	CO7	L5
36		Analyze the frame shown in using Kani's method taking advantage of symmetry. Draw BMD . 	15	CO5	L5
37		Analyse the continuous beam by Kani's method and Draw SFD and BMD 	15	CO6	L5
38		Analyse the continuous beam by flexibility matrix method and Draw SFD and BMD.	15	CO7	L5

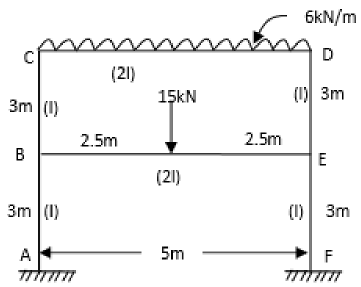
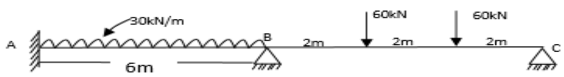
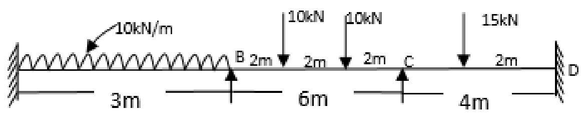
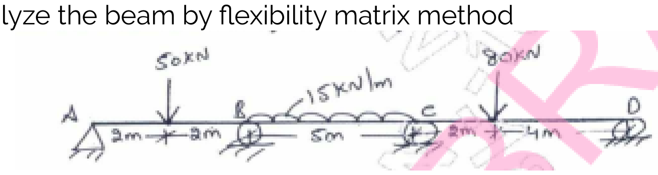
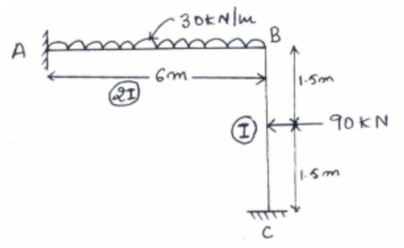
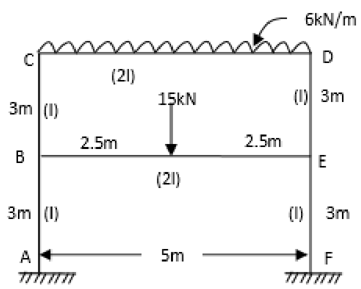


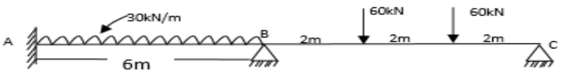
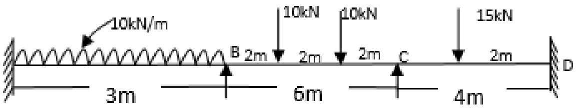
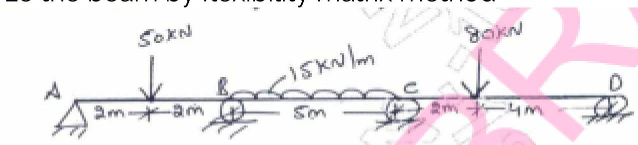
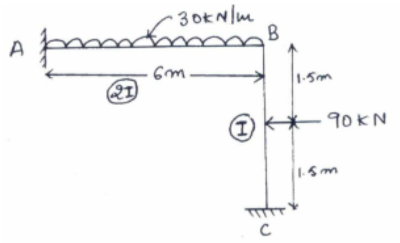
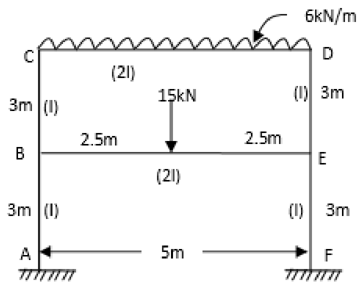
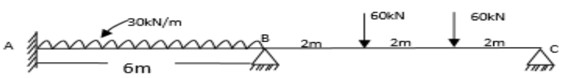
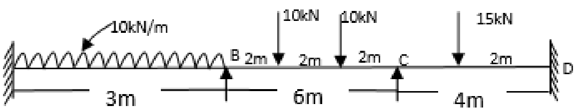
39		Analyze the beam by flexibility matrix method 	15	CO7	L5
40		Analyze the portal frame shown in using flexibility method. Draw SFD and BMD. 	15	CO7	L5
41		Analyze the frame shown in using Kani's method taking advantage of symmetry. Draw BMD . 	15	CO5	L5
42		Analyse the continuous beam by Kani's method and Draw SFD and BMD 	15	CO6	L5
43		Analyse the continuous beam by flexibility matrix method and Draw SFD and BMD. 	15	CO7	L5
44		Analyze the beam by flexibility matrix method 	15	CO7	L5
45		Analyze the portal frame shown in using flexibility method. Draw SFD and BMD. 	15	CO7	L5

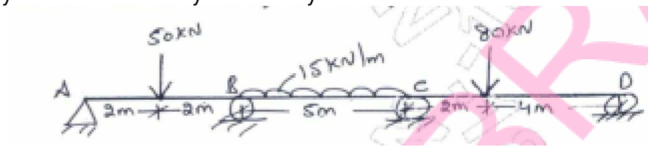
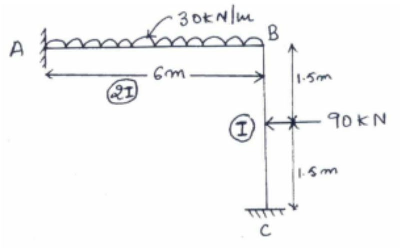
46		Analyze the frame shown in using Kani's method taking advantage of symmetry. Draw BMD . 	15	CO5	L5
47		Analyse the continuous beam by Kani's method and Draw SFD and BMD 	15	CO6	L5
48		Analyse the continuous beam by flexibility matrix method and Draw SFD and BMD. 	15	CO7	L5
49		Analyze the beam by flexibility matrix method 	15	CO7	L5
50		Analyze the portal frame shown in using flexibility method. Draw SFD and BMD. 	15	CO7	L5
51		Analyze the frame shown in using Kani's method taking advantage of symmetry. Draw BMD . 	15	CO5	L5

52		Analyse the continuous beam by Kani's method and Draw SFD and BMD 	15	CO6	L5
53		Analyse the continuous beam by flexibility matrix method and Draw SFD and BMD. 	15	CO7	L5
54		Analyze the beam by flexibility matrix method 	15	CO7	L5
55		Analyze the portal frame shown in using flexibility method. Draw SFD and BMD. 	15	CO7	L5
56		Analyze the frame shown in using Kani's method taking advantage of symmetry. Draw BMD . 	15	CO5	L5
57		Analyse the continuous beam by Kani's method and Draw SFD and BMD 	15	CO6	L5
58		Analyse the continuous beam by flexibility matrix method and Draw SFD and BMD. 	15	CO7	L5

59		Analyze the beam by flexibility matrix method 	15	CO7	L5
60		Analyze the portal frame shown in using flexibility method. Draw SFD and BMD. 	15	CO7	L5
61		Analyze the frame shown in using Kani's method taking advantage of symmetry. Draw BMD . 	15	CO5	L5
62		Analyse the continuous beam by Kani's method and Draw SFD and BMD 	15	CO6	L5
63		Analyse the continuous beam by flexibility matrix method and Draw SFD and BMD. 	15	CO7	L5
64		Analyze the beam by flexibility matrix method 	15	CO7	L5
65		Analyze the portal frame shown in using flexibility method. Draw SFD and BMD. 	15	CO7	L5

66		Analyze the frame shown in using Kani's method taking advantage of symmetry. Draw BMD . 	15	CO5	L5
67		Analyse the continuous beam by Kani's method and Draw SFD and BMD 	15	CO6	L5
68		Analyse the continuous beam by flexibility matrix method and Draw SFD and BMD. 	15	CO7	L5
69		Analyze the beam by flexibility matrix method 	15	CO7	L5
70		Analyze the portal frame shown in using flexibility method. Draw SFD and BMD. 	15	CO7	L5
71		Analyze the frame shown in using Kani's method taking advantage of symmetry. Draw BMD . 	15	CO5	L5

72		Analyse the continuous beam by Kani's method and Draw SFD and BMD  	15	CO6	L5
73		Analyse the continuous beam by flexibility matrix method and Draw SFD and BMD.  	15	CO7	L5
74		Analyze the beam by flexibility matrix method  	15	CO7	L5
75		Analyze the portal frame shown in using flexibility method. Draw SFD and BMD.  	15	CO7	L5
76		Analyze the frame shown in using Kani's method taking advantage of symmetry. Draw BMD .  	15	CO5	L5
77		Analyse the continuous beam by Kani's method and Draw SFD and BMD  	15	CO6	L5
78		Analyse the continuous beam by flexibility matrix method and Draw SFD and BMD.  	15	CO7	L5

79		Analyze the beam by flexibility matrix method 	15	CO7	L5
80		Analyze the portal frame shown in using flexibility method. Draw SFD and BMD. 	15	CO7	L5

D3. TEACHING PLAN - 3

Module – 5

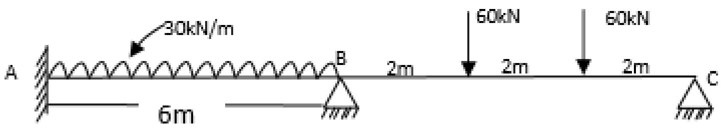
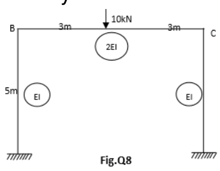
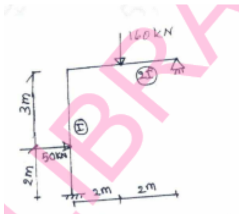
Title:	Matrix method of Analysis.(Flexibility matrix)	Appr Time:	12 Hrs
a	***Course Outcomes***	-	**Blooms**
-	The student should be able to:	-	**Level**
1	Student should be able to determine the moments in indeterminate beams with or without sinking having constant moment of inertia or variable moment of inertia using Flexibility method.	CO9	L5
2	Student should be able to determine the moments in frames subjected to sway or non sway having constant moment of inertia or variable moment of inertia using Flexibility method.	CO10	L5
b	***Course Schedule***		
Class No	**Module Content Covered**	**CO**	**Level**
41	Matrix Method of Analysis (Flexibility Method) : Introduction	CO9	L5
42	Axes and coordinates	CO9	L5
43	Flexibility matrix	CO9	L5
44	Analysis of continuous beams and plane trusses using system approach	CO10	L5
45	Analysis of simple orthogonal rigid frames using system approach with static indeterminacy ≤ 3	CO10	L5
46	Analysis of simple orthogonal rigid frames using system approach with static indeterminacy ≤ 3	CO9	L5
47	Numericals	CO9	L5
48	Numericals	CO10	L5
49	Numericals	CO10	L5
50	Numericals	CO10	L5
c	**Application Areas**	**CO**	**Level**
1	Used for the design of Reinforced cement concrete, Pre stressed concrete, steel and Marine structures.	CO7	L5
1	Used for the design of Reinforced cement concrete, Pre stressed concrete, steel and Marine structures.	CO8	L5
d	**Review Questions**	-	-
1	Analyse the continuous beam by flexibility matrix methodand Draw SFD and BMD	CO7	L5
2	Analyse the truss by flexibility matrix method and Draw SFD and BMD	CO8	L5

e	Experiences	-	-
1			
2			
Title:	Matrix method of Analysis.(Flexibility matrix)	Appr Time:	12 Hrs

E3. CIA EXAM – 3

a. Model Question Paper - 3

Crs Code:	17CV52	Sem:	V	Marks:	30	Time:	75 minutes
Course:	Analysis of Indeterminate Structures						

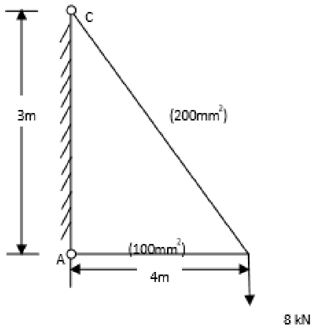
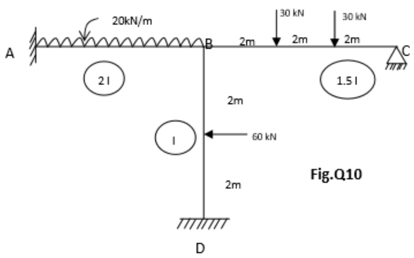
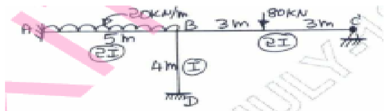
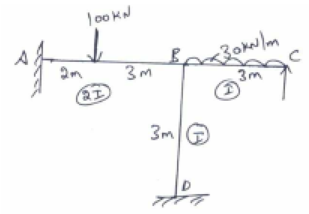
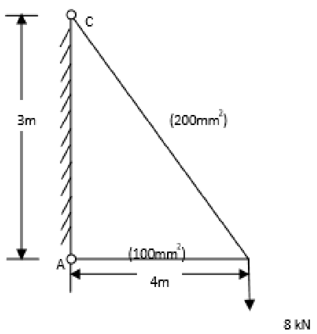
-	-	Note: Answer any 2 questions, each carry equal marks.	Marks	CO	Level
1		Analyse the continuous beam by flexibility matrix methodand Draw SFD and BMD. 	15	CO9	L5
		OR			
2		Analyse the truss by flexibility matrix method and Draw SFD and BMD.  Fig.Q8	15	CO10	L5
3		Analyze the jointed frame as shown in fig by stiffness matrix method and determine its bending moment diagram. 	15	CO9	L5
		OR			
4		Analyze the portal frame shown in using moment stiffness matrix method. Draw SFD and BMD. 	15	CO10	L5

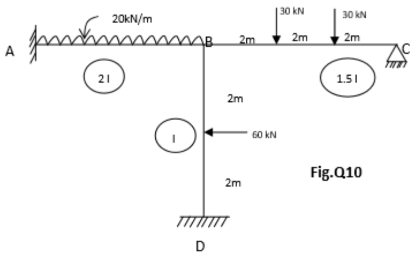
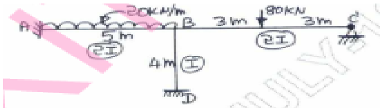
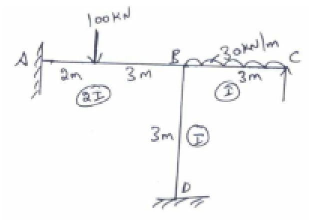
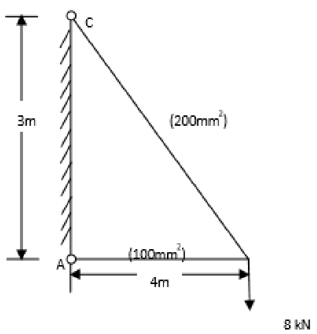
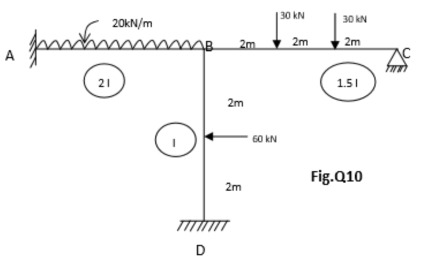
b. Assignment – 3

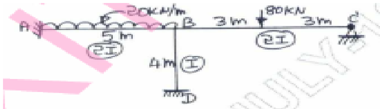
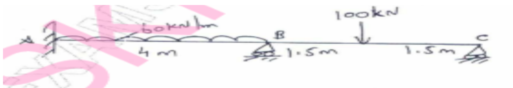
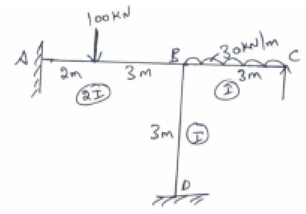
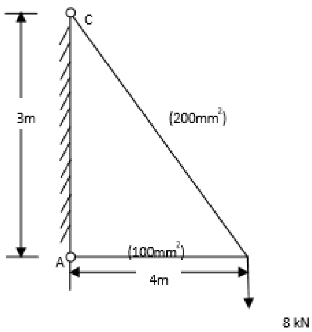
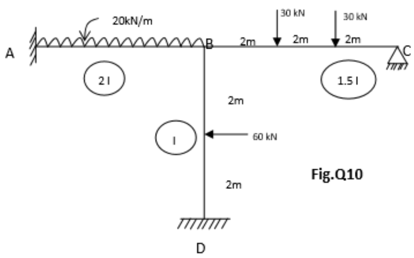
Note: A distinct assignment to be assigned to each student.

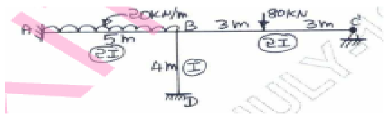
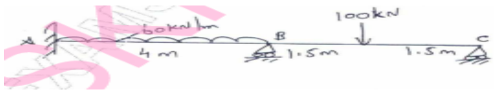
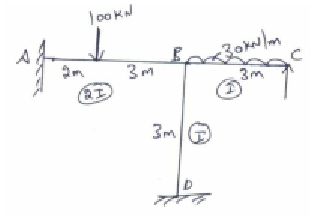
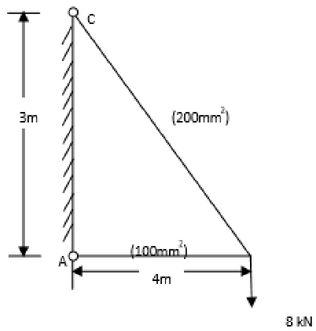
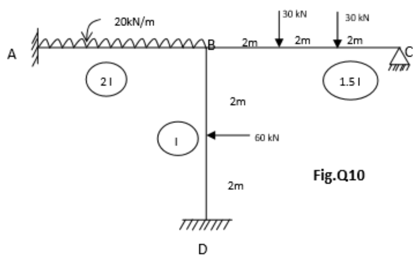
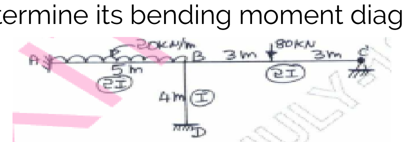
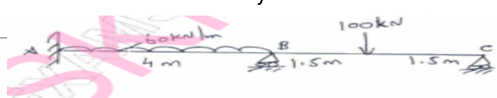
Model Assignment Questions							
Crs Code:	17CV52	Sem:	V	Marks:	15	Time:	75 minutes
Course:	Analysis of Indeterminate Structures						
Note: Each student to answer 2-3 assignments. Each assignment carries equal mark.							

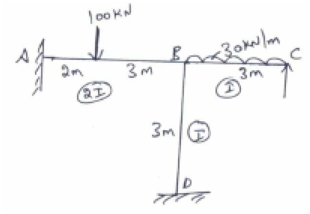
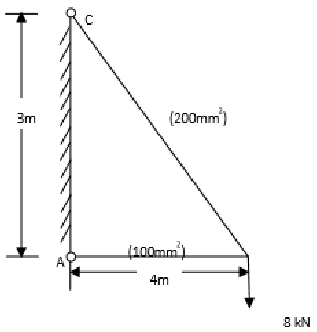
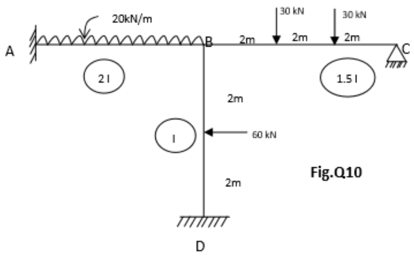
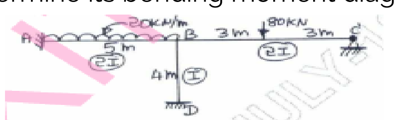
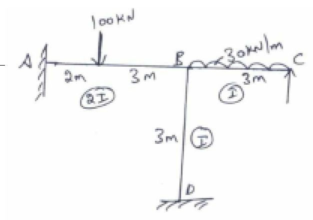
SNo	USN	Assignment Description	Marks	CO	Level
1		Using stiffness method, determine forces in the members AB	5	CO10	L2

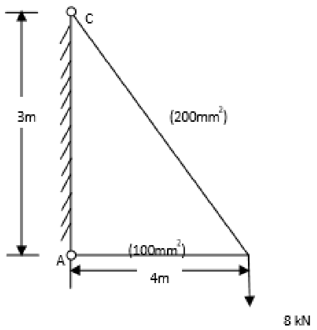
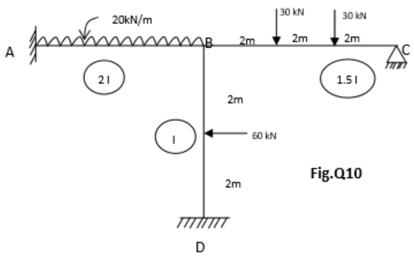
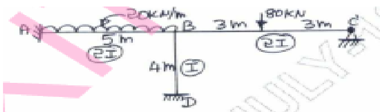
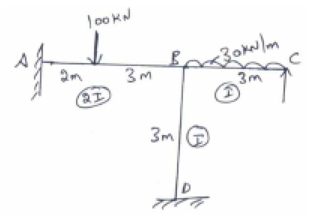
		and BC of a pin jointed frame given in Fig. Q9. The cross sections are indicated in the brackets against each member. E = 2 x 105 N/mm2  			
2		Analyze the frame shown in Fig. using stiffness method. Draw BMD  Fig.Q10	5	CO9	L4
3		Analyze the jointed frame as shown in fig by stiffness matrix method and determine its bending moment diagram.  	5	CO10	L2
4		Analyze the continous beam by stiffness matrix method.  	5	CO10	L2
5		Analyze the portal frame shown in using Stiffness matrix method. Draw SFD and BMD.  	5	CO9	L2
6		Using stiffness method, determine forces in the members AB and BC of a pin jointed frame given in Fig. Q9. The cross sections are indicated in the brackets against each member. E = 2 x 105 N/mm2  	5	CO10	L2

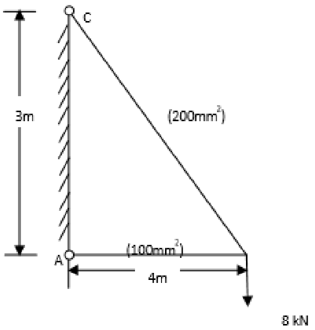
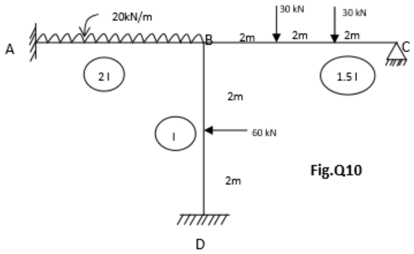
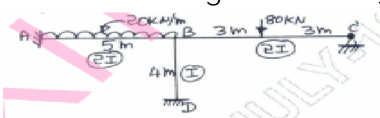
7		Analyze the frame shown in Fig. using stiffness method. Draw BMD 	5	CO9	L4
8		Analyze the jointed frame as shown in fig by stiffness matrix method and determine its bending moment diagram. 	5	CO10	L2
9		Analyze the continous beam by stiffness matrix method. 	5	CO10	L2
10		Analyze the portal frame shown in using Stiffness matrix method. Draw SFD and BMD. 	5	CO9	L2
11		Using stiffness method, determine forces in the members AB and BC of a pin jointed frame given in Fig. Q9. The cross sections are indicated in the brackets against each member. E = 2 x 105 N/mm2 	5	CO10	L2
12		Analyze the frame shown in Fig. using stiffness method. Draw BMD 	5	CO9	L4

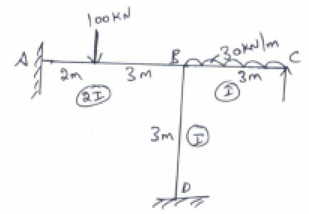
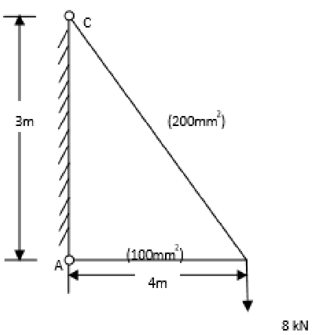
13		Analyze the jointed frame as shown in fig by stiffness matrix method and determine its bending moment diagram. 	5	CO10	L2
14		Analyze the continous beam by stiffness matrix method. 	5	CO10	L2
15		Analyze the portal frame shown in using Stiffness matrix method. Draw SFD and BMD. 	5	CO9	L2
16		Using stiffness method, determine forces in the members AB and BC of a pin jointed frame given in Fig. Q9. The cross sections are indicated in the brackets against each member. E = 2 x 105 N/mm2 	5	CO10	L2
17		Analyze the frame shown in Fig. using stiffness method. Draw BMD 	5	CO9	L4
18		Analyze the jointed frame as shown in fig by stiffness matrix method and determine its bending moment diagram.	5	CO10	L2

					
19		Analyze the continous beam by stiffness matrix method. 	5	CO10	L2
20		Analyze the portal frame shown in using Stiffness matrix method. Draw SFD and BMD. 	5	CO9	L2
21		Using stiffness method, determine forces in the members AB and BC of a pin jointed frame given in Fig. Q9. The cross sections are indicated in the brackets against each member. E = 2 x 105 N/mm2 	5	CO10	L2
22		Analyze the frame shown in Fig. using stiffness method. Draw BMD 	5	CO9	L4
23		Analyze the jointed frame as shown in fig by stiffness matrix method and determine its bending moment diagram. 	5	CO10	L2
24		Analyze the continous beam by stiffness matrix method. 	5	CO10	L2

25		Analyze the portal frame shown in using Stiffness matrix method. Draw SFD and BMD. 	5	CO9	L2
26		Using stiffness method, determine forces in the members AB and BC of a pin jointed frame given in Fig. Q9. The cross sections are indicated in the brackets against each member. E = 2 x 105 N/mm2 	5	CO10	L2
27		Analyze the frame shown in Fig. using stiffness method. Draw BMD 	5	CO9	L4
28		Analyze the jointed frame as shown in fig by stiffness matrix method and determine its bending moment diagram. 	5	CO10	L2
29		Analyze the continous beam by stiffness matrix method. 	5	CO10	L2
39		Analyze the portal frame shown in using Stiffness matrix method. Draw SFD and BMD. 	5	CO9	L2

31		Using stiffness method, determine forces in the members AB and BC of a pin jointed frame given in Fig. Q9. The cross sections are indicated in the brackets against each member. E = 2 x 105 N/mm2 	5	CO10	L2
32		Analyze the frame shown in Fig. using stiffness method. Draw BMD 	5	CO9	L4
33		Analyze the jointed frame as shown in fig by stiffness matrix method and determine its bending moment diagram. 	5	CO10	L2
34		Analyze the continous beam by stiffness matrix method. 	5	CO10	L2
35		Analyze the portal frame shown in using Stiffness matrix method. Draw SFD and BMD. 	5	CO9	L2
36		Using stiffness method, determine forces in the members AB and BC of a pin jointed frame given in Fig. Q9. The cross sections are indicated in the brackets against each member. E	5	CO10	L2

<table>
<tr><td></td><td></td><td>= 2 x 105 N/mm2

</td><td></td><td></td><td></td></tr>
<tr><td>37</td><td></td><td>Analyze the frame shown in Fig. using stiffness method. Draw BMD

</td><td>5</td><td>CO9</td><td>L4</td></tr>
<tr><td>38</td><td></td><td>Analyze the jointed frame as shown in fig by stiffness matrix method and determine its bending moment diagram.

</td><td>5</td><td>CO10</td><td>L2</td></tr>
<tr><td>39</td><td></td><td>Analyze the continous beam by stiffness matrix method.

</td><td>5</td><td>CO10</td><td>L2</td></tr>
<tr><td>40</td><td></td><td>Analyze the portal frame shown in using Stiffness matrix method. Draw SFD and BMD.

</td><td>5</td><td>CO9</td><td>L2</td></tr>
<tr><td>41</td><td></td><td>Using stiffness method, determine forces in the members AB and BC of a pin jointed frame given in Fig. Q9. The cross sections are indicated in the brackets against each member. E = 2 x 105 N/mm2

</td><td>5</td><td>CO10</td><td>L2</td></tr>
</table>

<table>
<tr><td></td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td>42</td><td></td><td>Analyze the frame shown in Fig. using stiffness method. Draw BMD

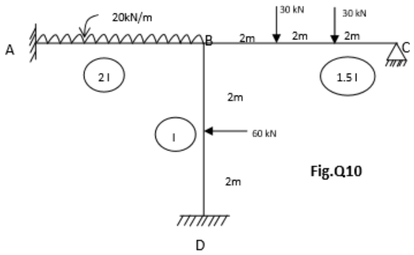
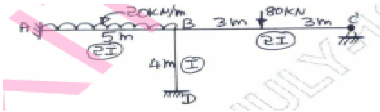
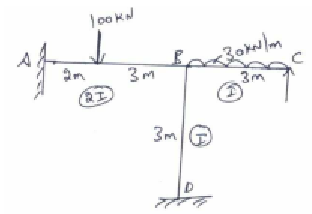
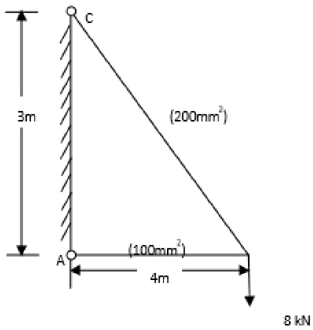


Fig.Q10</td><td>5</td><td>CO9</td><td>L4</td></tr>
<tr><td>43</td><td></td><td>Analyze the jointed frame as shown in fig by stiffness matrix method and determine its bending moment diagram.


</td><td>5</td><td>CO10</td><td>L2</td></tr>
<tr><td>44</td><td></td><td>Analyze the continous beam by stiffness matrix method.


</td><td>5</td><td>CO10</td><td>L2</td></tr>
<tr><td>45</td><td></td><td>Analyze the portal frame shown in using Stiffness matrix method. Draw SFD and BMD.


</td><td>5</td><td>CO9</td><td>L2</td></tr>
<tr><td>46</td><td></td><td>Using stiffness method, determine forces in the members AB and BC of a pin jointed frame given in Fig. Q9. The cross sections are indicated in the brackets against each member. E = 2 x 105 N/mm2


</td><td>5</td><td>CO10</td><td>L2</td></tr>
<tr><td>47</td><td></td><td>Analyze the frame shown in Fig. using stiffness method. Draw BMD

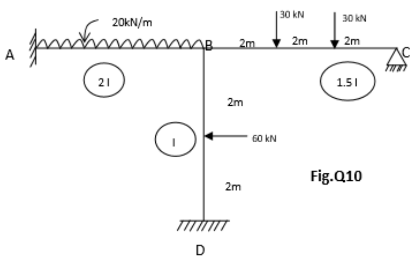
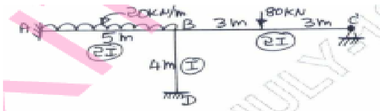
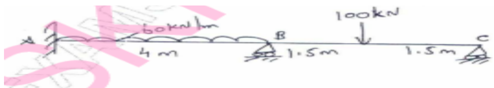
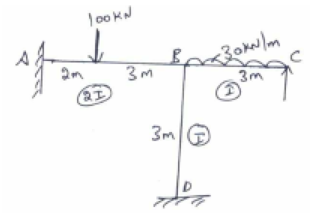
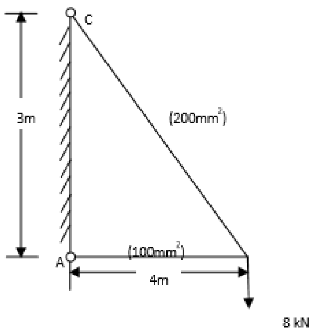
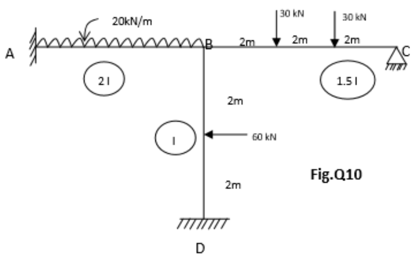
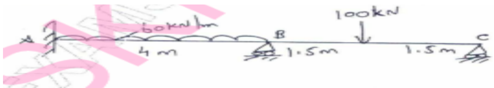
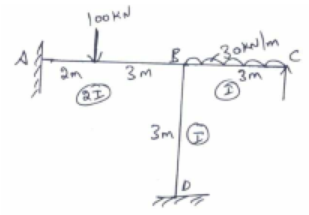
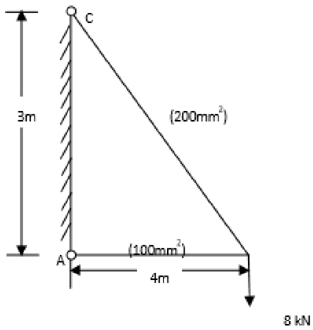
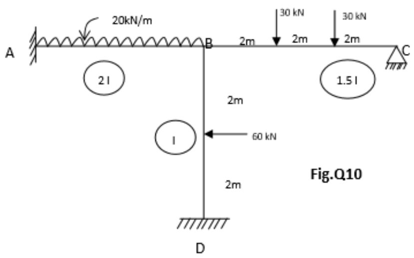
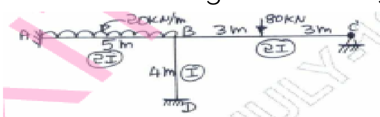
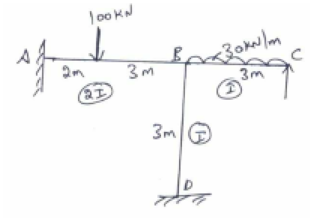
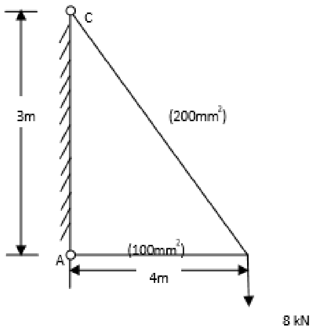
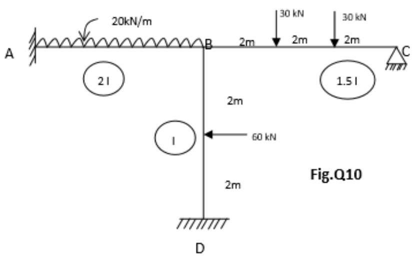
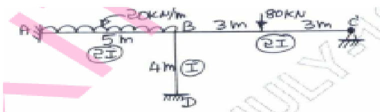
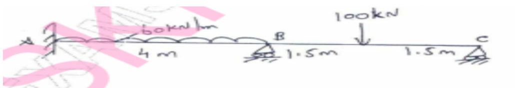
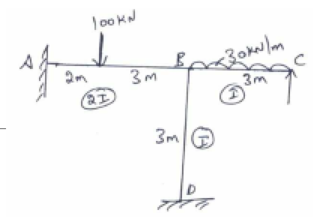
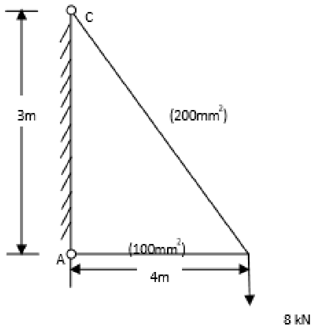
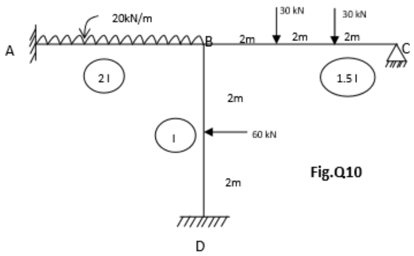
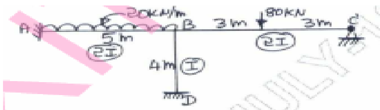
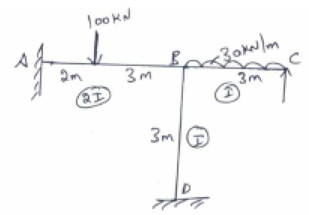


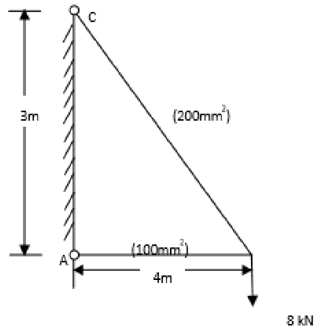
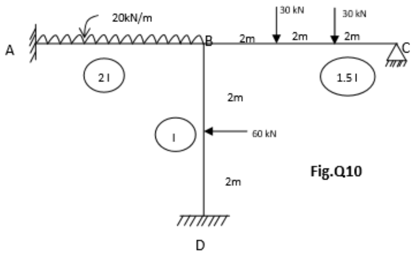
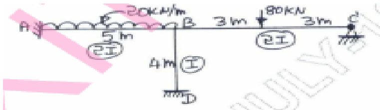
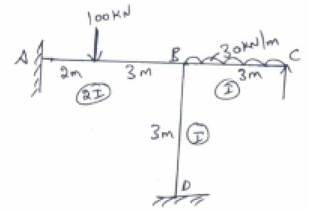
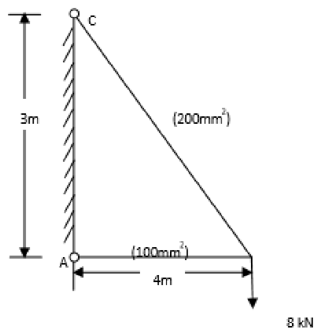
Fig.Q10</td><td>5</td><td>CO9</td><td>L4</td></tr>
</table>

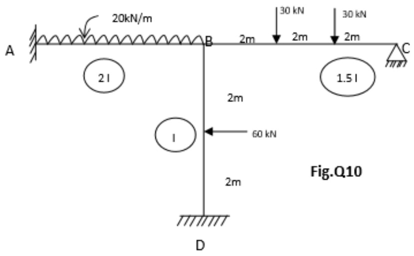
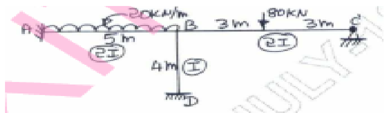
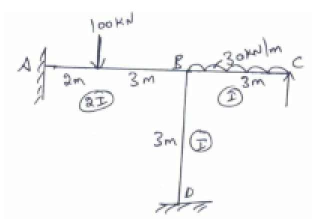
48		Analyze the jointed frame as shown in fig by stiffness matrix method and determine its bending moment diagram. 	5	CO10	L2
49		Analyze the continous beam by stiffness matrix method. 	5	CO10	L2
50		Analyze the portal frame shown in using Stiffness matrix method. Draw SFD and BMD. 	5	CO9	L2
51		Using stiffness method, determine forces in the members AB and BC of a pin jointed frame given in Fig. Q9. The cross sections are indicated in the brackets against each member. E = 2 x 105 N/mm2 	5	CO10	L2
52		Analyze the frame shown in Fig. using stiffness method. Draw BMD  Fig.Q10	5	CO9	L4
53		Analyze the jointed frame as shown in fig by stiffness matrix method and determine its bending moment diagram. 	5	CO10	L2

54		Analyze the continous beam by stiffness matrix method. 	5	CO10	L2
55		Analyze the portal frame shown in using Stiffness matrix method. Draw SFD and BMD. 	5	CO9	L2
56		Using stiffness method, determine forces in the members AB and BC of a pin jointed frame given in Fig. Q9. The cross sections are indicated in the brackets against each member. E = 2 x 105 N/mm2 	5	CO10	L2
57		Analyze the frame shown in Fig. using stiffness method. Draw BMD 	5	CO9	L4
58		Analyze the jointed frame as shown in fig by stiffness matrix method and determine its bending moment diagram. 	5	CO10	L2
59		Analyze the continous beam by stiffness matrix method. 	5	CO10	L2

60		Analyze the portal frame shown in using Stiffness matrix method. Draw SFD and BMD.  	5	CO9	L2
61		Using stiffness method, determine forces in the members AB and BC of a pin jointed frame given in Fig. Q9. The cross sections are indicated in the brackets against each member. E = 2 x 105 N/mm2  	5	CO10	L2
62		Analyze the frame shown in Fig. using stiffness method. Draw BMD  	5	CO9	L4
63		Analyze the jointed frame as shown in fig by stiffness matrix method and determine its bending moment diagram.  	5	CO10	L2
64		Analyze the continous beam by stiffness matrix method.  	5	CO10	L2
65		Analyze the portal frame shown in using Stiffness matrix method. Draw SFD and BMD.  	5	CO9	L2

66		Using stiffness method, determine forces in the members AB and BC of a pin jointed frame given in Fig. Q9. The cross sections are indicated in the brackets against each member. E = 2 x 105 N/mm2 	5	CO10	L2
67		Analyze the frame shown in Fig. using stiffness method. Draw BMD  Fig.Q10	5	CO9	L4
68		Analyze the jointed frame as shown in fig by stiffness matrix method and determine its bending moment diagram. 	5	CO10	L2
69		Analyze the continous beam by stiffness matrix method. 	5	CO10	L2
70		Analyze the portal frame shown in using Stiffness matrix method. Draw SFD and BMD. 	5	CO9	L2
71		Using stiffness method, determine forces in the members AB and BC of a pin jointed frame given in Fig. Q9. The cross sections are indicated in the brackets against each member. E = 2 x 105 N/mm2	5	CO10	L2

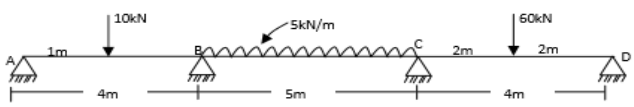
					
72		Analyze the frame shown in Fig. using stiffness method. Draw BMD 	5	CO9	L4
73		Analyze the jointed frame as shown in fig by stiffness matrix method and determine its bending moment diagram. 	5	CO10	L2
74		Analyze the continous beam by stiffness matrix method. 	5	CO10	L2
75		Analyze the portal frame shown in using Stiffness matrix method. Draw SFD and BMD. 	5	CO9	L2
76		Using stiffness method, determine forces in the members AB and BC of a pin jointed frame given in Fig. Q9. The cross sections are indicated in the brackets against each member. E = 2 x 105 N/mm2 	5	CO10	L2

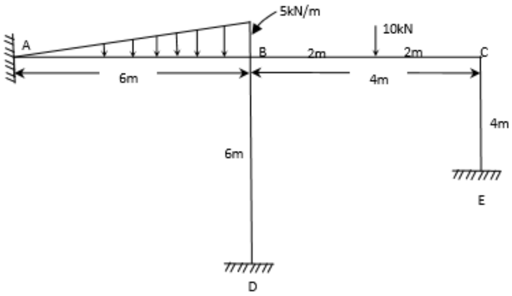
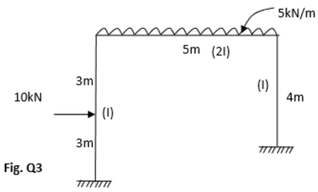
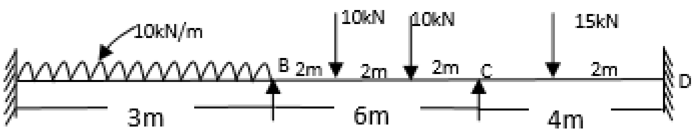
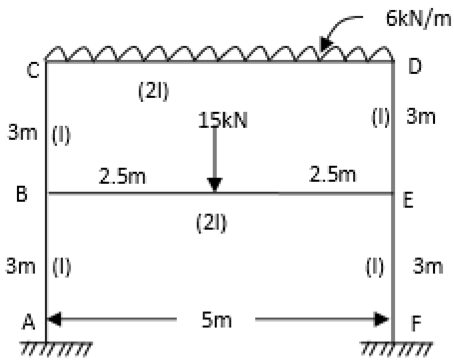
77		Analyze the frame shown in Fig. using stiffness method. Draw BMD 	5	CO9	L4
78		Analyze the jointed frame as shown in fig by stiffness matrix method and determine its bending moment diagram. 			
79		Analyze the continous beam by stiffness matrix method. 			
80		Analyze the portal frame shown in using Stiffness matrix method. Draw SFD and BMD. 			

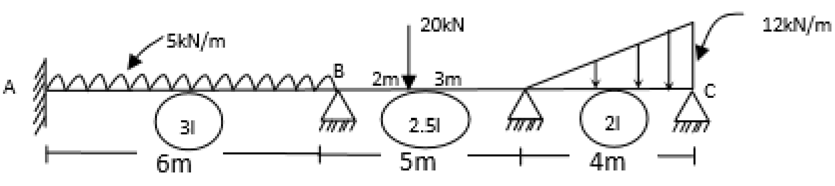
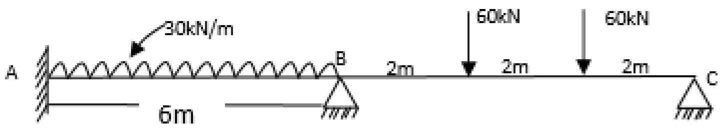
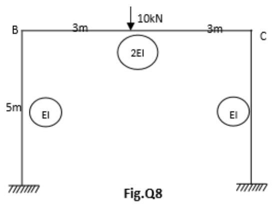
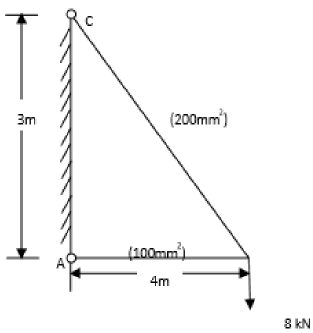
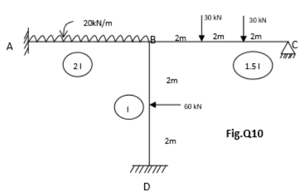
F. EXAM PREPARATION

1. University Model Question Paper

Course:	Analysis of Indeterminate structures					Month / Year	May /2018
Crs Code:	17cv52	Sem:	V	Marks:	100	Time:	180 minutes

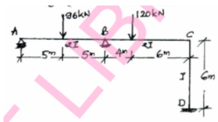
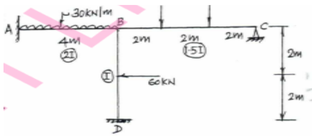
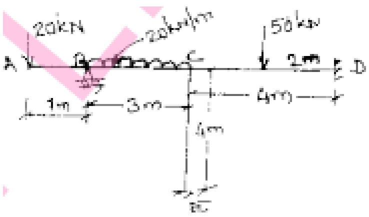
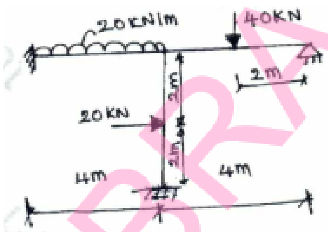
-	Note	Answer all FIVE full questions. All questions carry equal marks.	Marks	CO	Level
1	a	A horizontal beam ABCD is loaded as shown in Fig. Q1. Plot SFD and BMD. Use slope deflection method. Support B settles by 10mm. E = 2 x 10^5 N/mm^2 I = 2.4 x 10^6 mm^4.  Fig. Q.1	20	CO1	L5
		OR			
2	a	Analyze the frame shown in Fig. Q2 using slope deflection method. Draw BMD.	20	CO2	L5

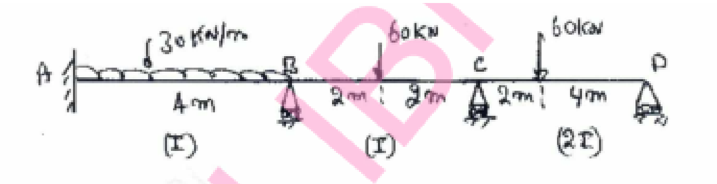
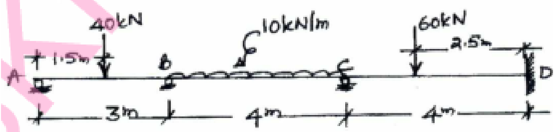
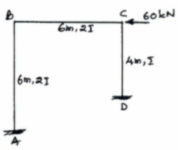
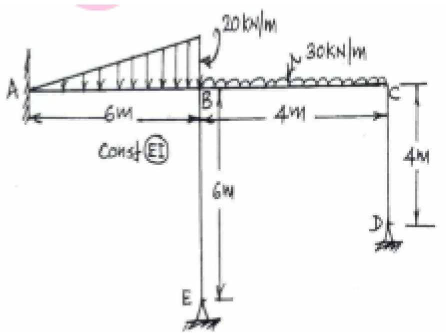
		 Fig. Q.2			
3	a	Analyze the portal frame shown in Fig. Q3 using moment distribution method. Draw BMD 	20	CO3	L5
		OR			
4	a	Analyze the continuous beam shown in Fig.Q4 using moment distribution method. Draw SFD and BMD.  Fig.Q4	20	C04	L5
5	a	Analyze the frame shown in using Kani's method taking advantage of symmetry. Draw BMD . 	20	C05	L5
		OR			
6	a	Analyze the beam shown in Fig.Q6 using Kani's method. Draw BMD and elastic curve.	20	C06	L5

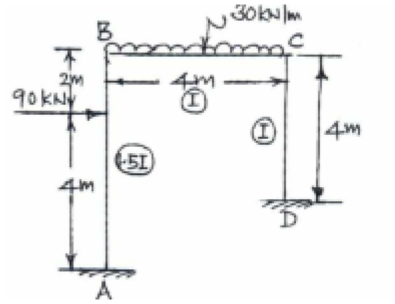
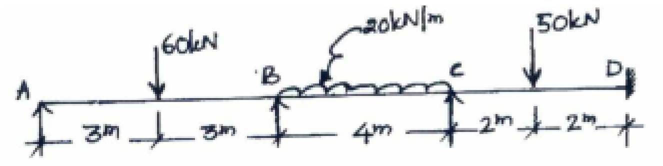
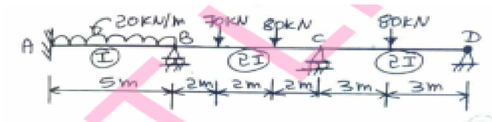
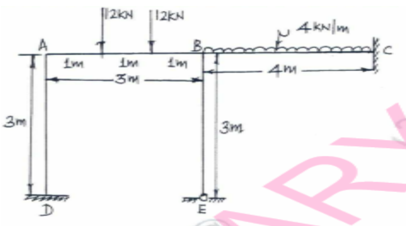
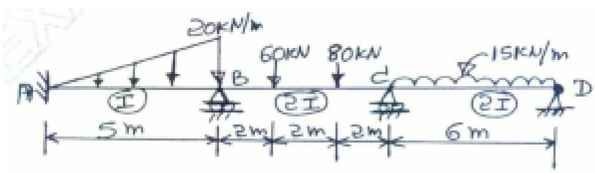
		 **Fig.Q6**			
7	a	Using flexibility matrix method, analyze the beam shown in Sketch SFD and BMD.  **Fig.Q7**	20	C07	L5
		OR			
8	a	Analyze the frame shown in using matrix flexibility method. Draw BMD  Fig.Q8	20	C08	L5
		OR			
9	a	Using stiffness method, determine forces in the members AB and BC of a pin jointed frame given in Fig. Q9. The cross sections are indicated in the brackets against each member. E = 2 x 105 N/mm2 	20	C09	L5
		OR			
10	a	Analyze the frame shown in Fig. using stiffness method. Draw BMD  Fig.Q10	20	C010	L5

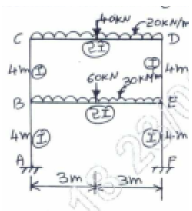
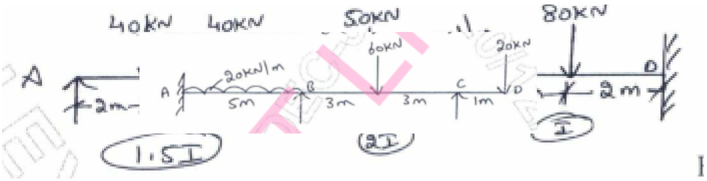
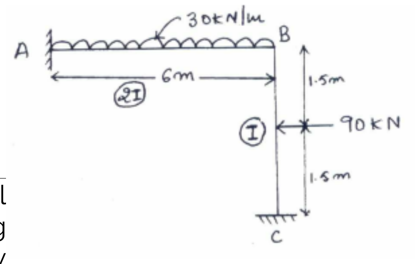
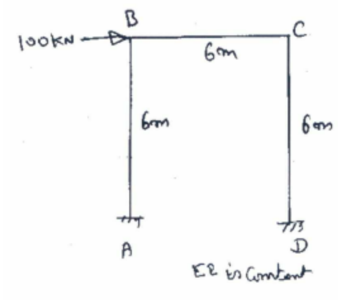
2. SEE Important Questions

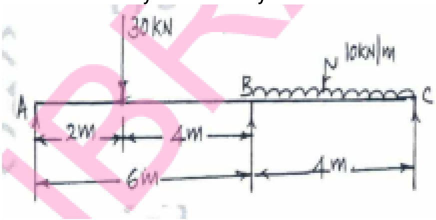
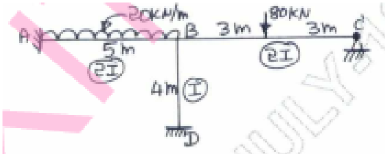
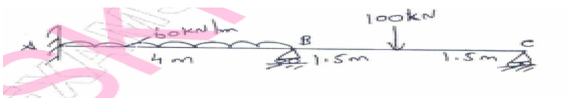
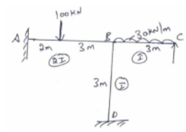
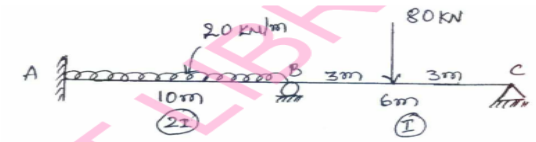
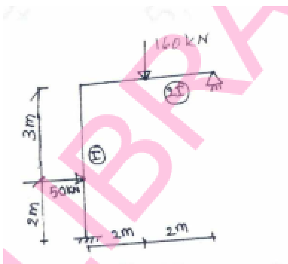
Course:	Analysis of Indeterminate Structures					Month / Year	May /2018
Crs Code:	17cv52	Sem:	3	Marks:	100	Time:	180 minutes

	Note	Answer all FIVE full questions. All questions carry equal marks.	-	-	
Module	Qno.	Important Question	**Marks**	**CO**	**Year**
1	1	Analyze the frame shown in Fig. Q2 using slope deflection method. Draw BMD. 	20	CO1	2012
	2	Analyze the frame shown in Fig. Q2 using slope deflection method. Draw BMD. 	20	CO2	2013
	3	Analyze the frame shown in Fig. Q2 using slope deflection method. Draw BMD. 	20	CO2	2014
	4	Analyze the frame shown in Fig. Q2 using slope deflection method. Draw BMD.  Fig. Q2	20	CO2	2015

	5	Analyze the continuous beam shown in Fig.Q4 using slope deflection method. Draw SFD and BMD. 	20	CO1	2015
2	1	Analyze the continuous beam shown in Fig.Q4 using moment distribution method. Draw SFD and BMD. 	20	CO3	2012
	2	Analyze the portal frame shown in using moment distribution method. Draw SFD and BMD. 	20	CO4	2012
	3	Analyze the portal frame shown in using moment distribution method. Draw SFD and BMD. 	20	CO4	2013

	4	Analyze the portal frame shown in using moment distribution method. Draw SFD and BMD.  	20	CO2	2014
	5	Analyze the continuous beam shown in Fig.Q4 using moment distribution method. Draw SFD and BMD.  	20	CO3	2018
3	1	Analyze the continuous beam shown in Fig.Q4 using kani's method. Draw SFD and BMD. 	20	CO5	2012
	2	Analyze the portal frame shown in using moment Kani's method. Draw SFD and BMD. 	20	CO6	2013
	3	Analyze the continuous beam shown in using kani's method. Draw SFD and BMD. 	20	CO5	2015
	4	Analyze the portal frame shown in using Kani's method. Draw SFD and BMD.	20	CO6	2018

					
	5	Analyze the continuous Analyze the shown in using kani's method. Draw SFD and BMD. 	20	CO5	2017
4	1	Analyze the beam by flexibility matrix method 	20	C07	2018
	2	Analyze the beam by flexibility matrix method. 	20	CO7	2018
	3	Analyze the portal frame shown in using flexibility method. Draw SFD and BMD.	20	c08	2016
	4	Analyze the portal frame shown in using flexibility method. Draw SFD and BMD. 	20	c08	2015

	5	Analyze the continous beam by flexibility matrix method. 	20	c07	2013
5	1	Analyze the jointed frame as shown in fig by stiffness matrix method and determine its bending moment diagram. 	20	c08	2018
	2	Analyze the continous beam by stiffness matrix method. 	20	c07	2017
	3	Analyze the portal frame shown in using Stiffness matrix method. Draw SFD and BMD. 	20	c010	2015
	4	Analyze the continous beam by stiffness matrix method. 	20	c09	2016
	5	Analyze the portal frame shown in using moment stiffness matrix method. Draw SFD and BMD. 	20	c010	2015

G. Content to Course Outcomes

1. TLPA Parameters

Table 1: TLPA – Example Course

Module-#	Course Content or Syllabus (Split module content into 2 parts which have similar concepts)	Content Teaching Hours	Blooms' Learning Levels for Content	Final Blooms' Level	Identified Action Verbs for Learning	Instruction Methods for Learning	Assessment Methods to Measure Learning
A	B	C	D	E	F	G	H
1	SLOPE DEFLECTION METHOD: Introduction, sign convention, development of slope deflection equation, analysis of continuous beams including settlements,	5	- L2 - L4 - L5	L5	- -	- Lecture - -	- Slip Test - -
1	Analysis of orthogonal rigid plane frames including sway frames with kinematic indeterminacy ≤ 3	5	- L2 - L4 - L5	L5	- -	- Lecture - Tutorial -	- Assignment - -
2	MOMENT DISTRIBUTION METHOD: Introduction, Definition of terms, Development of method, Analysis of continuous beams with support yielding,	5	- L2 - L4 - L5	L5	- -	- Lecture -	- Assignment -
2	Analysis of orthogonal rigid plane frames including sway frames with kinematic indeterminacy ≤ 3	5	- L2 - L4 - L5	L5	- -	- Lecture -	- Slip Test -
3	KANI'S METHOD: Introduction, Concept, Relationships between bending moment and deformations, Analysis of continuous beams with and without settlements,	5	- L2 - L4 - L5	L5	- -	- Lecture -	- Slip Test -
3	Analysis of frames with and without sway	5	- L2 - L4 - L5	L5	- -	- Lecture - Tutorial -	- Assignment - -
4	MATRIX METHOD OF ANALYSIS (FLEXIBILITY METHOD) :Introduction, Axes and coordinates, Flexibility matrix, Analysis of continuous beams and plane trusses using system approach,.	5	- L2 - L4 - L5	L5	- -	- Lecture - Tutorial -	- Assignment - -
4	Analysis of simple orthogonal rigid frames using system approach with static indeterminacy ≤ 3	5	- L2 - L4 - L5	L5	- -	- Lecture - Tutorial -	- Assignment - -
5	MATRIX METHOD OF ANALYSIS (STIFFNESS METHOD) Introduction, Stiffness matrix, Analysis of continuous beams and plane trusses using system approach..	5	- L2 - L4 - L5	L5	- -	- Lecture - -	- Assignment - -
5	Analysis of simple orthogonal rigid frames using system approach with kinematic indeterminacy ≤ 3	5	- L2 - L4 - L5	L5	- -	- Lecture - -	- Assignment - -

2. Concepts and Outcomes:

Table 2: Concept to Outcome – Example Course

Mo	Learning or	Identified	Final Concept	Concept	CO Components	Course Outcome

dule-#	Outcome from study of the Content or Syllabus	Concepts from Content		Justification (What all Learning Happened from the study of Content / Syllabus. A short word for learning or outcome)	(1.Action Verb, 2.Knowledge, 3.Condition / Methodology, 4.Benchmark)	**Student Should be able to ...**
A	*I*	*J*	*K*	*L*	*M*	*N*
1	- -	slope	slope			determine the moments in indeterminate beams with or without sinking having constant moment of inertia or variable moment of inertia using slope deflection method.
1	- -	slope				determine the moments in frames subjected to sway or non sway having constant moment of inertia or variable moment of inertia using slope deflection method.
2	- -	Distribution factor carry over moment	Distribution factor			determine the moments in indeterminate beams with or without sinking having constant moment of inertia or variable moment of inertia using moment distribution method.
2	- -	Distribution factor carry over moment				determine the moments in frames subjected to sway or non sway having constant moment of inertia or variable moment of inertia using moment distribution method.
3	- -	Rotation factor kani's box	Rotation factor			determine the moments in indeterminate beams with or without sinking having constant moment of inertia or variable moment of inertia using Kani's method.

3	- -	Rotation factor kani's box				determine the moments in frames subjected to sway or non sway having constant moment of inertia or variable moment of inertia using Kani's method.
4	- -	Displacement formation of flexibility matrix	Displacement formation of flexibility matrix			determine the moments in indeterminate beams with or without sinking having constant moment of inertia or variable moment of inertia using Flexibility method.
4	- -	Displacement formation of flexibility matrix				determine the moments in frames subjected to sway or non sway having constant moment of inertia or variable moment of inertia using Flexibility method.
5	- -	Rotation formation of stiffness matrix	Rotation formation of stiffness matrix			determine the moments in indeterminate beams with or without sinking having constant moment of inertia or variable moment of inertia using Stiffness method.
5		Rotation formation of stiffness matrix				determine the moments in frames subjected to sway or non sway having constant moment of inertia or variable moment of inertia using Stiffness method.