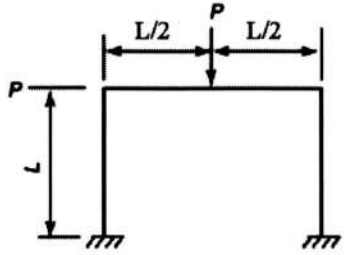
UNIT – IV

8. A two-span continuous beam having span AB = 6 m and BC = 8 m is subjected to central concentrated loads of 60 kN and 80 kN respectively. If the beam is simply supported at the ends, calculate plastic moment required for the beam. CO4

(OR)

9. Determine the collapse load of the portal frame shown in figure. CO4



****

F-2

Hall Ticket Number:

CE314(CEEL01) (R20)

B.TECH. DEGREE EXAMINATION, NOVEMBER-2024

Semester V [Third Year] (Regular & Supplementary)

ADVANCED STRUCTURAL ANALYSIS

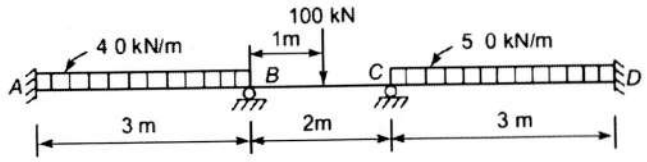
Time: Three hours Maximum Marks: 70

Answer Question No.1 compulsorily. (14 x 1 = 14)
Answer One Question from each unit. (4 x 14 = 56)

1. Answer the following:
   (a) Differentiate absolute and relative stiffness. CO1
   (b) Define the degree of static indeterminacy of a structure. CO1
   (c) Define Distribution Factor. CO1
   (d) Define flexibility. CO2
   (e) What is meant by generalized coordinate system? CO2
   (f) Define flexibility matrix. CO2
   (g) What is the use of finding kinematic indeterminacy of a structure? CO3
   (h) Define stiffness matrix. CO3
   (i) What is the relation between stiffness matrix and flexibility matrix? CO3
   (j) State upper bound theorem. CO4
   (k) Define plastic hinge. CO4
   (l) State Uniqueness theorem. CO4
   (m) Define shape factor. CO4
   (n) Write the failure mechanisms. CO4

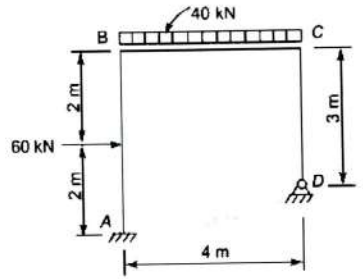
UNIT – I

2. Solve for the support moments for the continuous beam shown in figure using moment distribution method. Under the load support B sinks by 2.5 mm. $I = 350 \times 10^{-6}$ m^4 and $E = 200 \times 10^6$ kN/m^2 for all members CO1



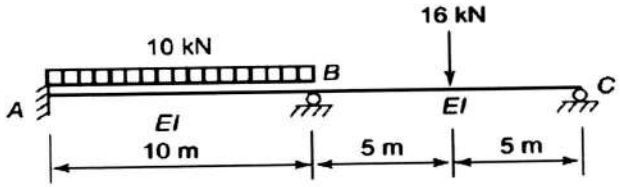
(OR)

3. For the frame shown in figure, determine the end moments of members using moment distribution method. EI is constant. CO1



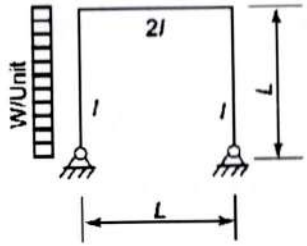
UNIT – II

4. For the structure shown in figure choose M_A and M_B as redundant. Solve for redundant using flexibility matrix method and draw final moment diagram. CO2



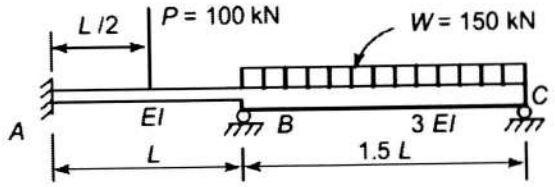
(OR)

5. Determine the moment in the members of the frames shown in figure using flexibility matrix method. Take L = 4 m; w = 10 kN/m. CO2



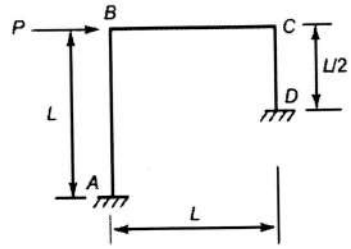
UNIT – III

6. Analyse the beam shown in figure using stiffness matrix method. CO3



(OR)

7. Analyse the rigid frame shown in figure for displacements and member forces using stiffness matrix method. Neglect axial deformations. EI is constant, take P = 70 kN, L = 6 m. CO3



Hall Ticket Number:

CE314(CEEL01) (R20)

B.TECH. DEGREE EXAMINATION, APRIL-2024

Semester V [Third Year] (Supplementary)

ADVANCED STRUCTURAL ANALYSIS

Time: Three hours Maximum Marks: 70

Answer Question No.1 compulsorily. (14 x 1 = 14)

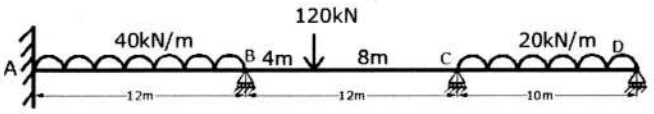
Answer One Question from each unit. (4 x 14 = 56)

1. Answer the following:

(a)	Define stiffness of a member whose further end is hinged or over hang.	CO1
(b)	Define distribution factor.	CO1
(c)	Define carry-our factor.	CO1
(d)	What is the sum of distribution factors of a joint?	CO1
(e)	What is the degree of static indeterminacy of a three span continuous beam ABCD fixed at A and simply supported at D?	CO1
(f)	Define flexibility coefficient of a member f_{11}	CO2
(g)	Write the Maxwell reciprocal theorem.	CO2
(h)	Write the relation between displacement and force.	CO3
(i)	Write the slope deflection equation of a member.	CO3
(j)	Define the kinematic indeterminacy of a structure.	CO3
(k)	What is the product of stiffness matrix and flexibility matrix?	CO3
(l)	Define plastic hinge.	CO4
(m)	What is the shape factor for rectangular section?	CO4
(n)	Define collapse load.	CO4

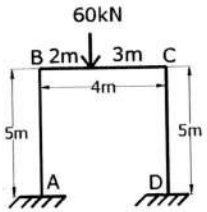
UNIT – I

2. Analyse the beam shown in figure by moment distribution method. Find the support reactions. Draw the bending moment diagram. CO1



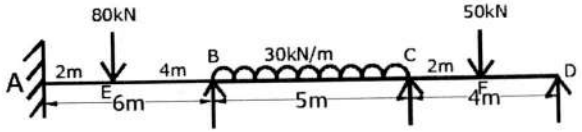
(OR)

3. Analyse the frame shown in figure by moment distribution method. CO1



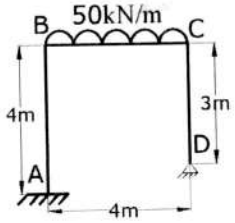
UNIT – II

4. Analyse the beam shown in figure by flexibility matrix method. Draw bending moment diagram. CO2



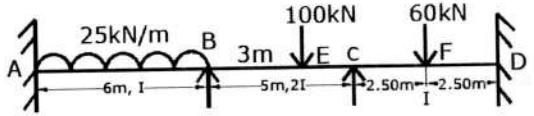
(OR)

5. Analyse the frame shown in figure by flexibility matrix method. CO2



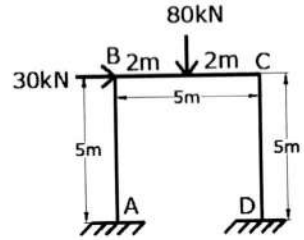
UNIT – III

6. Analyse the frame shown in figure by stiffness matrix method. CO3



(OR)

7. Analyse the frame shown in figure by stiffness matrix method. CO3

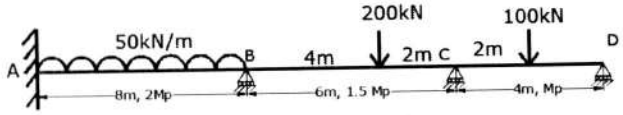


UNIT – IV

8. (a) Write a short note on plastic analysis of structures. 7M CO4
   (b) Determine the shape factor for diamond section. 7M CO4

(OR)

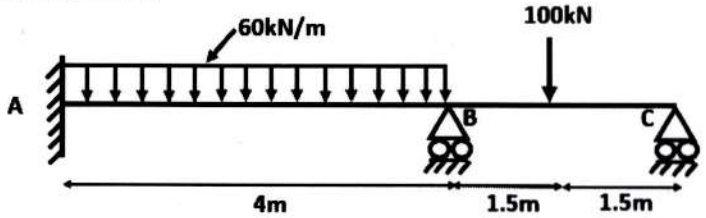
9. Determine the plastic moment carrying capacity of the beam shown in figure. The given loads are working loads. The load factor is 1.75 CO4



****

(OR)

7. Analyse the continuous beam shown in figure by stiffness matrix method. CO3

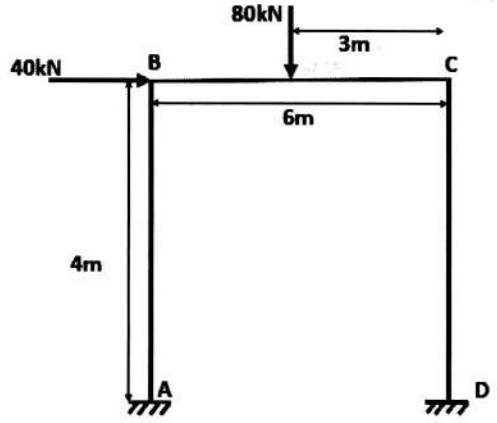


UNIT – IV

8. (a) Explain a note on uniqueness theorem, upper bound theorem and lower bound theorem. (7M) CO4
   (b) Compute shape factor for circular section. (7M) CO4

(OR)

9. Evaluate the plastic moment capacity of the section required for the frame shown in figure. The loads shown are the working loads. Take load factor = 1.75. Assume same plastic moment capacity for all the members. CO4



****

Hall Ticket Number:

F-2

CE314(CEEL01) (R20)

B.TECH. DEGREE EXAMINATION, DECEMBER-2023

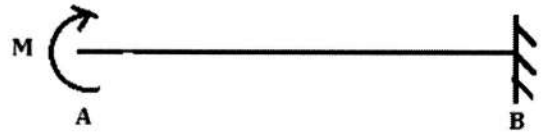
Semester V [Third Year] (Regular & Supplementary)

ADVANCED STRUCTURAL ANALYSIS

Time: Three hours Maximum Marks: 70

Answer Question No.1 compulsorily. (14 x 1 = 14)
Answer One Question from each unit. (4 x 14 = 56)

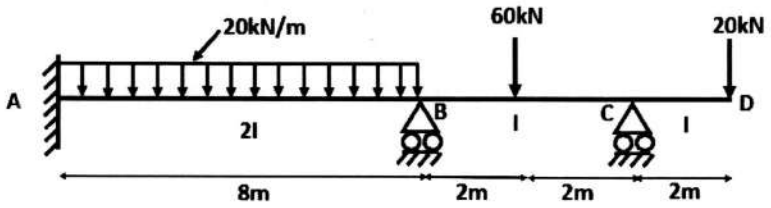
1. Answer the following in brief:
   (a) In moment distribution method, what is the carryover moment at the fixed end? CO1
   (b) Define distribution factor. CO1
   (c) Compute Carryover Moment at end B due to moment M applied at end A for the given cantilever beam.



   CO1
   (d) Define flexibility coefficient. CO2
   (e) Give the mathematical expression for the degree of static indeterminacy of rigid jointed plane frames. CO2
   (f) Define a primary structure. CO2
   (g) What is the product of stiffness matrix and flexibility matrix? CO3
   (h) What are the basic unknowns in stiffness matrix method? CO3
   (i) List the properties of the stiffness matrix. CO3
   (j) Define shape factor. CO4
   (k) Define plastic hinge. CO4
   (l) Give the governing equation for bending. CO4
   (m) What is the standard value of shape factor for triangular section? CO4
   (n) What are the failure mechanisms of structures? CO4

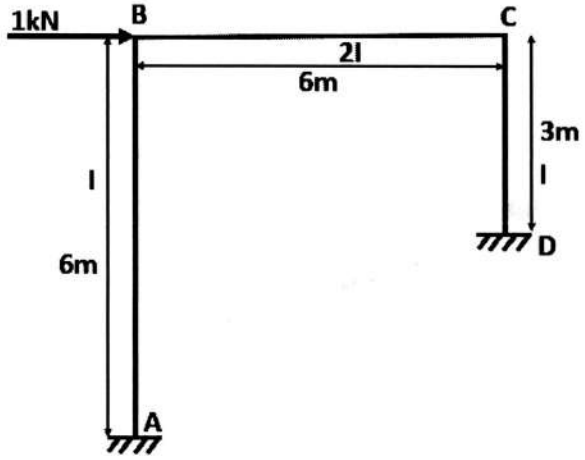
UNIT – I

2. Analyse continuous the beam ABCD shown in figure by moment distribution method. Find support reactions and draw bending moment diagram. CO1



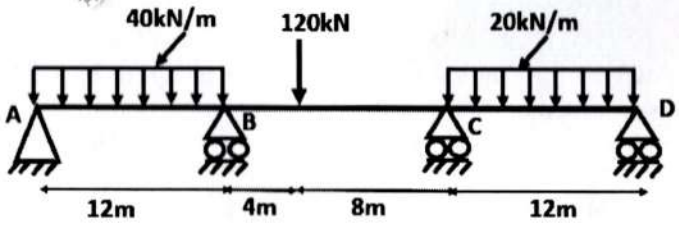
(OR)

3. Analyse the frame shown in figure by moment distribution method CO1



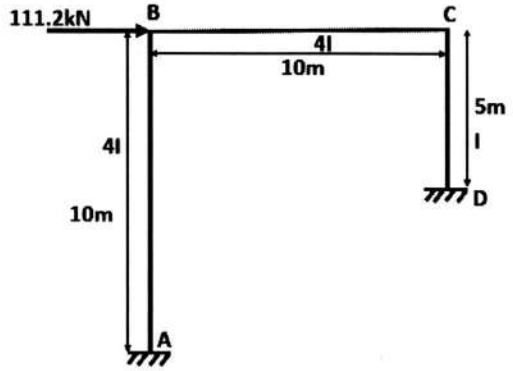
UNIT – II

4. Analyse the continuous beam shown in figure by flexibility matrix method. CO2



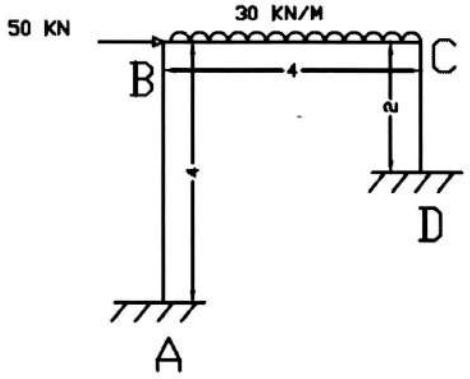
(OR)

5. Analyse portal frame ABCD as shown in figure by flexibility matrix method. CO2



UNIT – III

6. Analyse portal frame ABCD as shown in figure by stiffness matrix method. EI is constant throughout. Length of section are in metre. CO3

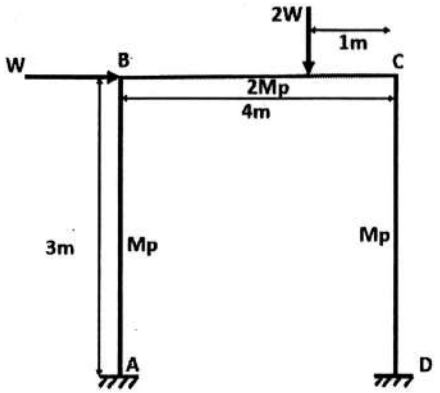


UNIT – IV

8. (a) Explain a note on Plastic Analysis. (7M) CO4
   (b) Compute the shape factor for Diamond Section. (7M) CO4

(OR)

9. Determine the collapse load Wc for the frame shown in figure. CO4



****

F-2

Hall Ticket Number:

CE314(CEEL01) (R20)

B.TECH. DEGREE EXAMINATION, JUNE-2023

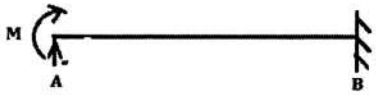
Semester V [Third Year] (Supplementary)

ADVANCED STRUCTURAL ANALYSIS

Time: Three hours Maximum Marks: 70

Answer Question No.1 compulsorily. (14 x 1 = 14)
Answer One Question from each unit. (4 x 14 = 56)

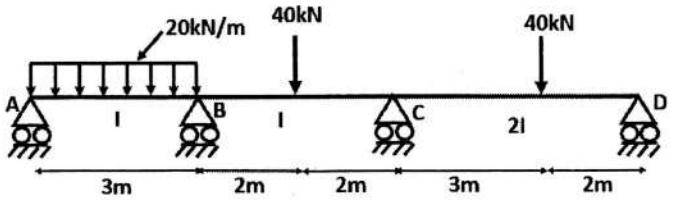
1. Answer the following:
   (a) What carry-over factor represents? CO1
   (b) What is distribution factor? CO1
   (c) Compute Carryover Moment at end B due to moment M applied at end A for the given propped cantilever beam. CO1



   (d) What is meant by force method in structural analysis? CO2
   (e) What is Flexibility matrix method? CO2
   (f) Why is flexibility method also called as compatibility method or force method? CO2
   (g) What is the relation between the flexibility matrix and stiffness matrix? CO3
   (h) Write equation for calculating size of global stiffness matrix. CO3
   (i) What is the basic aim of the stiffness method? CO3
   (j) Define plastic modulus of a section Zp. CO4
   (k) State upper bound theory. CO4
   (l) What are the different types of mechanisms? CO4
   (m) What is the standard value of shape factor for square section? CO4
   (n) Write the failure mechanisms of structures. CO4

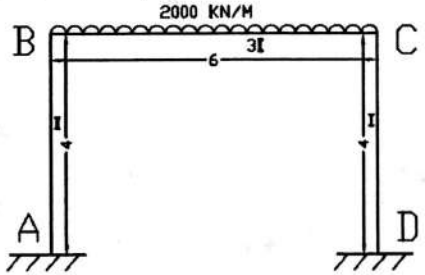
UNIT – I

2. Analyse continuous the beam ABCD shown in figure by moment distribution method. Find Support reactions and draw bending moment diagram. CO1



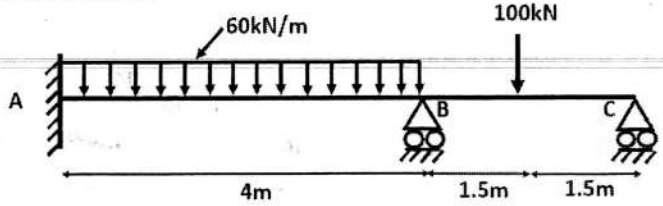
(OR)

3. Analyse the frame shown in figure by moment distribution method. All lengths are in meters. CO1



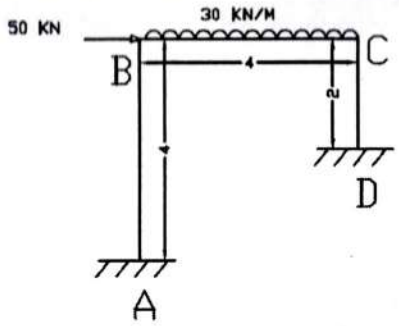
UNIT – II

4. Analyse the continuous beam shown in figure by flexibility matrix method. CO2



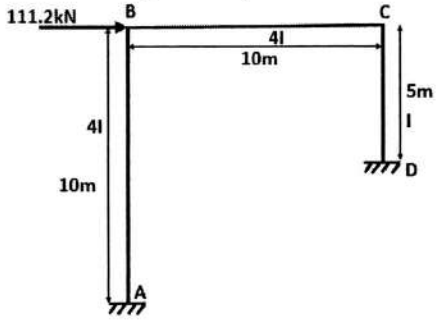
(OR)

5. Analyse portal frame ABCD as shown in figure by flexibility matrix method. EI is constant throughout. Length of section are in metre. CO2



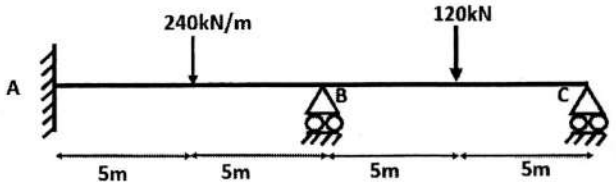
UNIT – III

6. Determine the elements of the stiffness matrix for the portal frame with reference to the coordinates mention as below: CO3
1-Clockwise rotation at A, 2-Horizontal towards right at B, 3-Clockwise rotation at B, 4-Clockwise rotation at C, 5-Horizontal towards right at D, 6-Clockwise rotation at D.



(OR)

7. Analyse the continuous beam shown in figure by stiffness matrix method. CO3



9. (a) Describe stress-strain curve for different materials. (7M) CO4
   (b) Define plasticity. Explain the two types of plasticity theorems. (7M) CO4

****

Hall Ticket Number: file-2

CE314(CEEL01) (R20)

B.TECH. DEGREE EXAMINATION, MARCH-2023

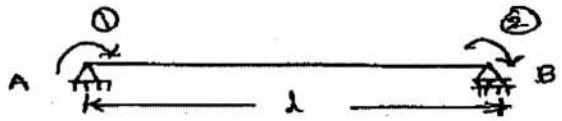
Semester V [Third Year] (Regular)

ADVANCED STRUCTURAL ANALYSIS

Time: Three hours Maximum Marks: 70

Answer Question No.1 compulsorily. (14 x 1 = 14)
Answer One Question from each unit. (4 x 14 = 56)

1. Answer the following:
   (a) Define carryover moment. CO1
   (b) What is sway correction factor? CO1
   (c) What are the conditions of equilibrium? CO1
   (d) Sketch a continuous beam. CO2
   (e) What is single bay plane frame? CO2
   (f) Define degree of freedom and list its types. CO2
   (g) Develop the stiffness matrix for the beam as shown in the figure. CO3



   (h) State the properties of stiffness matrix. CO3
   (i) Write the relationship between stiffness and flexibility. CO3
   (j) Differentiate between stiffness and flexible method. CO4
   (k) Define settlement. CO4
   (l) State lower bound theory. CO4
   (m) Define shape factor. CO4
   (n) Give the governing equation for bending. CO4

UNIT – I

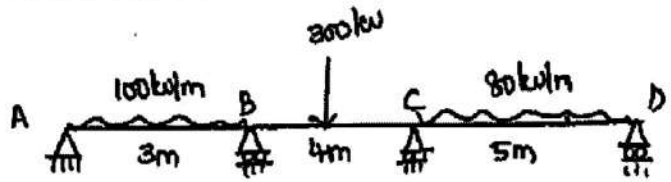
2. (a) What is distribution factor? Explain with eat sketch. (7M) CO1
   (b) Write the applications of analysing the continuous beams. (7M) CO1

(OR)

3. Derive expressions for computing the deflection, moment and shear in an infinite length of beam subjected to a concentrated load. Also, sketch the variation of deflection, slope, bending moment and shear force. CO1

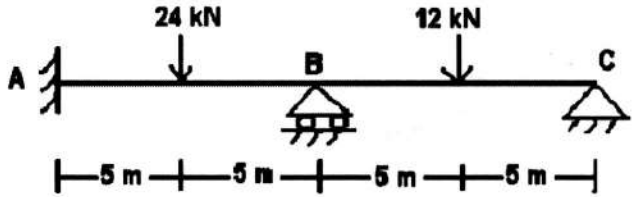
UNIT – II

4. Analyse the continuous beam as shown in figure by flexibility method. CO2



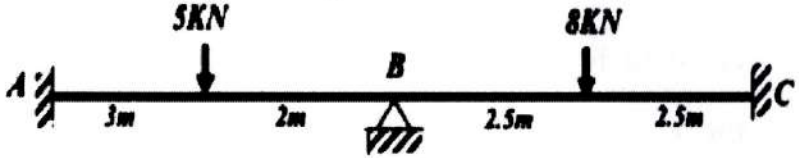
(OR)

5. Analyse the continuous beam ABC shown in figure by flexibility matrix method and sketch the bending moment diagram. CO2



UNIT – III

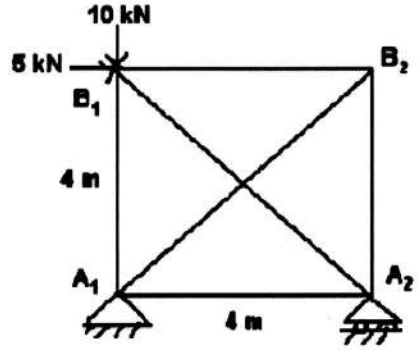
6. A beam ABC, 10 m long, fixed at ends A and B is continuous over joint B and is loaded as shown in figure. Using the slope deflection method, compute the end moments and plot the bending moment diagram. Also, sketch the deflected shape of the beam. The beam has constant EI for both the spans. CO3



(OR)

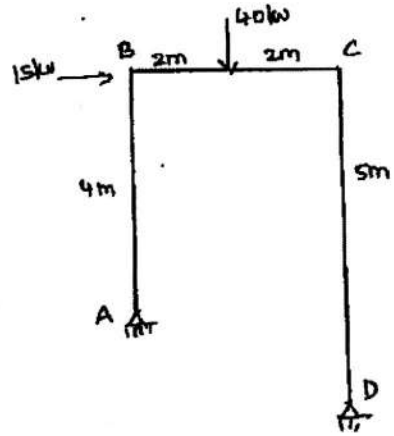
7. (a) Derive the formula for relation for load factor and factor of safety. (7M) CO3

   (b) A statically indeterminate frame shown in figure carries a load of 80 kN. Analyse the frame by matrix flexibility method. Take A and E are same for all members. (7M) CO3



UNIT – IV

8. For the following frame as shown in figure. Find the value of fully plastic moment required. All the members have same value of Mp. CO4



(OR)