28/4/17

15. (a) A continuous beam ABC is simply supported at A, fixed at C and continuous over support B. The span AB is 6 m and carries a concentrated load of 60 kN at its mid-span and the span BC is 8 m and carries a uniformly distributed load of 10 kN/m. Take the flexural rigidity for portion AB as 2EI and that for portion BC as EI. Analyze the beam by moment distribution method and draw the shearing force and bending moment diagrams.

Or

(b) Analyze the frame shown in Fig. Q.15(b) by moment distribution method and draw the bending moment diagram.

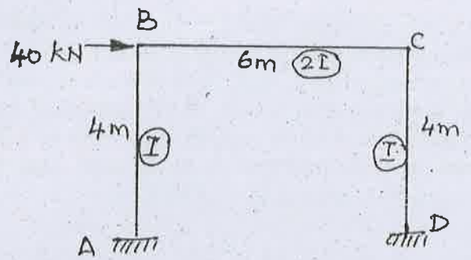


Fig. Q.15(b)

Reg. No. :

Question Paper Code : 71570

B.E./B.Tech. DEGREE EXAMINATION, APRIL/MAY 2017.

Fifth Semester

Civil Engineering

CE 6501 — STRUCTURAL ANALYSIS — I

(Regulations 2013)

Time : Three hours Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. Determine the degree of kinematic indeterminacy of the frame shown in Fig. Q.1 and show the same in the frame.

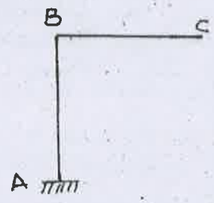


Fig. Q.1

2. What is the reaction at the Propped end of a propped cantilever when it is subjected to a concentrated load 'W' at mid-span?

3. Specify the condition for position of loading to obtain maximum bending moment at any section in a simply supported beam when a uniformly distributed load shorter than span crosses the beam.

4. What is the limiting distance from propped end for having only Positive portion in the influence line diagram for bending moment at any point in a propped cantilever?

5. Name the internal stress resultants induced in an arch section

6. What are the methods available for the analysis of a fixed arch?

7. What are the conditions used in slope deflection method to determine the unknown joint deformations (translations and rotations) in an unsymmetrical portal frame?

8. How do you analyze a symmetrical frame Subjected to symmetrical loading using the advantage of symmetry by slope deflection method?

9. State the reasons for a portal frame to sway.

10. Specify the condition to use the Naylor's simplification in moment distribution method for the analysis of frames.

PART B — (5 × 16 = 80 marks)

11. (a) A continuous beam ABC of uniform section is simply supported at A, B and C. The spans AB and BC are 6 m and 4 m respectively. The span AB carries a uniformly distributed load of 8 kN/m and the span BC carries a central concentrated load of 12 kN. Determine the support reactions Using energy method and draw the bending moment diagram.

Or

(b) Using consistent deformation method, determine the vertical reaction at the roller support (D) for the frame shown in Fig. Q.11(b). Flexural rigidity EI is constant for all the members.

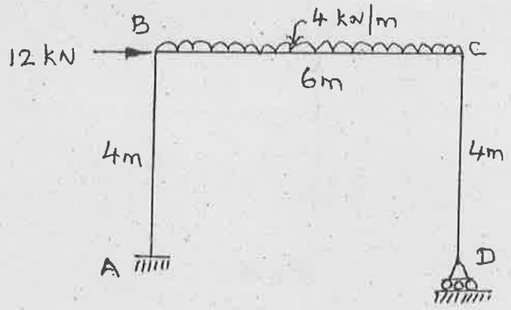


Fig. Q.11(b)

12. (a) A simply supported girder has a span of 40 m. A moving load consisting of a uniformly distributed load of 1 kN/m over a length of 8 m preceded by a concentrated load of 6 kN moving at a fixed distance of 2 m in front of the distributed load crosses the girder. Determine using influence line diagram the value of greatest bending moment.

Or

(b) A continuous beam ABC is simply resting on supports A and C, and continuous over the support B. The span AB is 8 m and the span BC is 6 m. Draw the influence line for moment at B. Assume flexural rigidity is constant throughout and calculate the influence line ordinates at 2 m intervals.

13. (a) A circular arch rib of 20 m span with a central rise of 5 m is hinged at the crown and at the springing. It carries a vertical point load of 20 kN at a horizontal distance of 4 m from left hinge. Calculate the horizontal thrust and maximum hogging bending moment in the arch. Also draw the bending moment diagram.

Or

(b) A two hinged parabolic arch of span 60 m and central rise 6 m is subjected to a vertical crown load of 40 kN. Allowing for rib shortening, temperature rise of 20°C and yield of each support of 0.06 mm/10 kN, determine the horizontal thrust. Take moment of inertia at the crown as 60×10^8 mm^4, area of cross section of arch rib as 1,00,000 mm^2, modulus of elasticity of arch material as 10 kN/mm^2 and coefficient of thermal expansion of arch material as 11×10^{-6} /° C.

14. (a) A continuous beam ABC 24 m long is fixed at A, simply supported at B and C. The intermediate support B is at 12 m from A and sinks by 30 mm. The span AB carries a uniformly distributed load of 3 kN/m and the span BC carries a point load of 24 kN at 8 m from C. Analyze the beam by slope deflection method and draw the shearing force and bending moment diagrams. Take the flexural rigidity EI as 40000 kN – m^2 and is constant throughout.

Or

(b) Analyze the portal frame shown in Fig. Q.14.(b) by slope deflection method and draw the bending moment diagram.

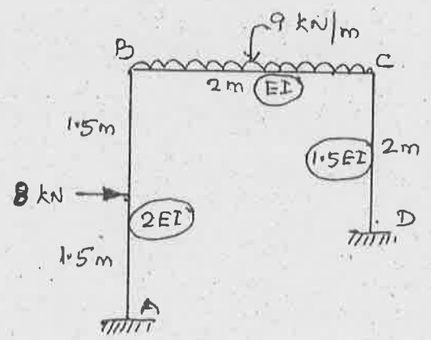


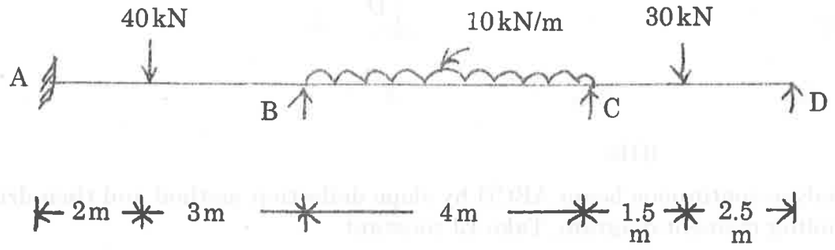
Fig. Q.14(b)

PART – C (1×15=15 Marks)

16. a) A single load of 100 kN rolls along a girder of 20 m span. Draw the diagrams of maximum bending moment and shear force. What will be the absolute maximum positive shear force and bending moment ?

(OR)

b) Analyse the continuous beam loaded as shown in fig. by the method of moment distribution. Sketch the bending moment and shear force diagram.



Reg. No. :

Question Paper Code : 40797

03/05/18 AN

B.E./B.Tech. DEGREE EXAMINATION, APRIL/MAY 2018
Fifth Semester
Civil Engineering
CE 6501 – STRUCTURAL ANALYSIS – I
(Regulations 2013)

Time : Three Hours Maximum : 100 Marks

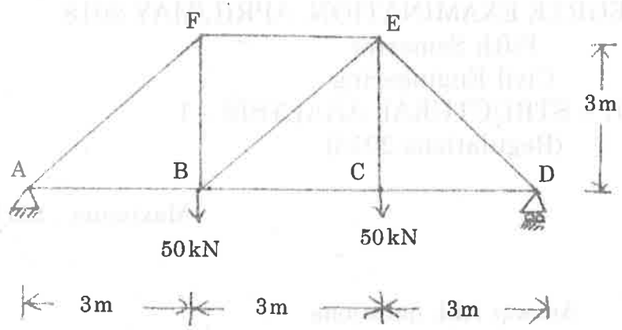
Answer ALL questions

PART – A (10×2=20 Marks)

1. What is meant by thermal stresses ?
2. Define static indeterminacy of a structure.
3. What is the absolute maximum bending moment due to a moving udl longer than the span of a simply supported beam ?
4. Define similitude.
5. Under what conditions will the bending moment in an arch be zero throughout.
6. Define "Rib Shortening" in arches.
7. Define degrees of freedom.
8. The continuous beam is to be analysed by slope-deflection method. What are the unknowns and, to determine them, what are the conditions used ?
9. What are the advantages of continuous beam over simply supported beam ?
10. Define : Stiffness factor.

PART – B (5×13=65 Marks)

11. a) Determine the vertical displacement of joint C of the steel truss shown in fig. The cross sectional area of each member is A = 400 mm² and E = 2 × 10⁵ N/mm².



(OR)

b) A simply supported beam of span 6 m is subjected to a concentrated load of 45 kN at 2 m from the left support. Calculate the deflection under the load point. Take E = 200 × 10⁶ kN /m² and I = 14 × 10⁻⁶m⁴.

12. a) In a simply supported girder AB of span 20 m, determine the maximum bending moment and maximum shear force at a section 5 m from A, due to the passage of a uniformly distributed load of intensity 20 kN/m, longer than a span.

(OR)

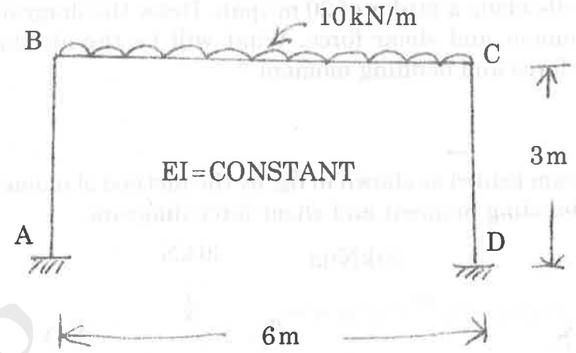
b) A single rolling load of 100 kN moves on a girder of span 20 m. (a) Construct the influence lines for (i) shear force and (ii) bending moment for a section 5 m from the left support. (b) Construct the influence lines for points at which the maximum shears and maximum bending moment develop. Determine these values. **(7+6)**

13. a) A parabolic arch hinged at the ends has a span of 60 m and rise of 12 m. A concentrated load of 80 kN acts at 15 m from the left hinge. The second moment of area varies as the secant of the inclination of the arch axis. Calculate the horizontal thrust and the reactions at the hinge. Also calculate the net bending moment at the section.

(OR)

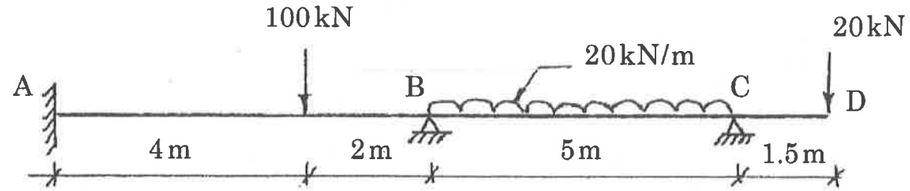
b) A parabolic 3-hinged arch of span 'l' is subjected to an u.d.l. of w/m run over the entire span. Find the horizontal thrust and bending moment at any section XX.

14. a) Analyse the frame by slope deflection method.

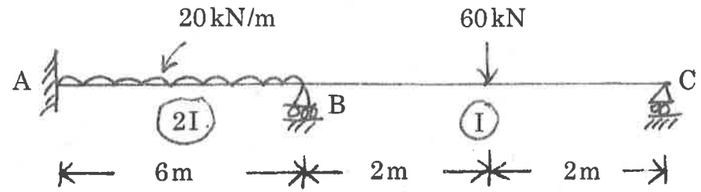


(OR)

b) Analyse continuous beam ABCD by slope deflection method and then draw bending moment diagram, Take EI constant.

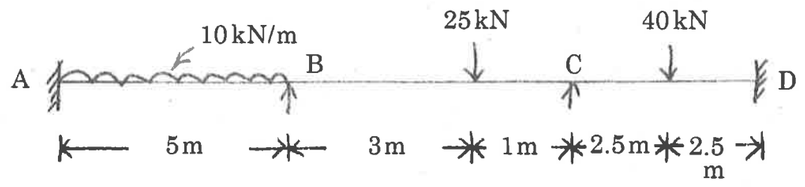


15. a) Analyse the continuous beam as shown in fig. by moment distribution method.



(OR)

b) Analyse the continuous beam loaded as shown in fig. by moment distribution method. Sketch the bending and shear force diagram.



(b) Analyse the continuous beam shown in Fig.Q.15(b) using moment distribution method.

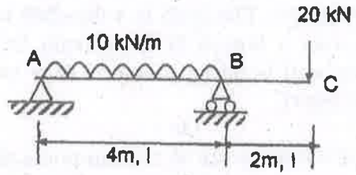


Fig.Q.15(b)

PART C — (1 × 15 = 15 marks)

16. (a) A train of 5 wheel loads crosses a simply supported beam of span 22.5 m. Using influence lines calculate the maximum positive and negative shear forces at mid span. And absolute maximum bending moment anywhere in the span.

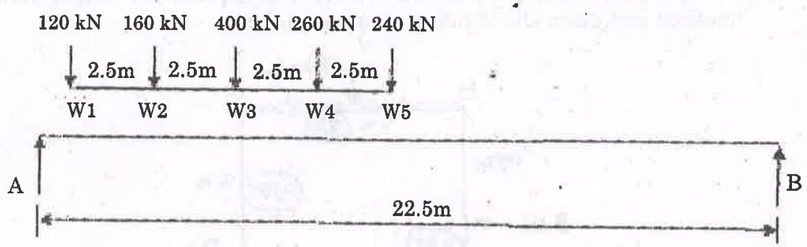


Fig.Q.16(a)

Or

(b) A two hinged parabolic arch of span L and rise R carries a UDL of w/m run over the left hand half of the span. The moment of inertia of the arch rib varies as the secant of the slope of the rib axis.

(i) Obtain the expression for the horizontal thrust H. (10)

(ii) Calculate the horizontal thrust and bending moment at quarter span point on the right half of the span if $l = 20\ m$, $r = 4\ m$ and w = 20 kN/m. (5)

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Reg. No. : | | | | | | | | | | | | |

Question Paper Code : 52769

B.E./B.Tech. DEGREE EXAMINATIONS, APRIL/MAY, 2019.

Fifth Semester

Civil Engineering

CE 6501 — STRUCTURAL ANALYSIS — I

(Regulation 2013)

Time : Three hours Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. Determine the degree of kinematic indeterminacy of the frame shown in Fig. Q.1 and show the same in the frame.

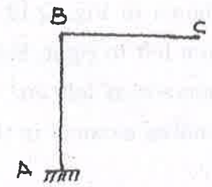


Fig.Q.1

2. What is the reaction at the propped end of a propped cantilever when it is subjected to a concentrated load 'W' at mid-span?
3. What are the uses of influence lines?
4. State Muller Breslau's principle.
5. What are the advantages of three hinged semi circular arch?
6. How do you do account settlement effects in arches?
7. Distinguish between Sway type and Non-sway type problems.
8. Write the advantages of slope deflection method.
9. What do you understand by the term distribution factor?
10. What are the conditions in which a frame is subjected to sway?

PART B — (5 × 13 = 65 marks)

11. (a) Find the forces in the members of the truss shown in Fig.Q.11(a). The cross sectional area and Young's modulus of all the members are same. pt

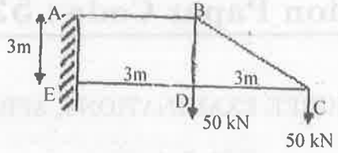


Fig.Q.11(a)

Or

(b) Analyse the truss shown in Fig.Q.11(b) by consistent deformation method. Assume that the cross sectional area of all the members are same.

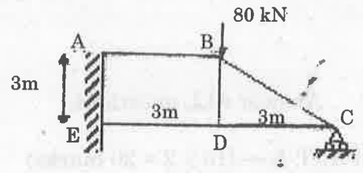


Fig. Q.11(b)

12. (a) A train of loads as shown in Fig. Q.12 (a) crosses a simply Supported beam of 24 m span from left to right. Using influence line determine the maximum bending moment at left one - third span point and also the absolute maximum bending moment in the beam.

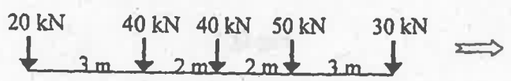


Fig. Q.12 (a)

Or

(b) A continuous beam ABC is simply resting on supports A and C, and Continuous over the support B. The span AB is 6 m and the span BC is 8 m. Draw the influence line diagram for moment at B. Assume Flexural rigidity is Constant throughout and calculate the influence line ordinates at 2 m intervals.

13. (a) A three hinged parabolic arch of span 20 m has its crown 9 in high from the left support and 4 m higher than the right support. The crown of the arch is at a horizontal distance of 12 in from the left support and 8 m from the right support. The arch is subjected to a uniformly distributed load of 3 kN/m over a length of 14 m from the right support. Find the horizontal thrust and bending moment at a horizontal distance of 4 m from the right support.

Or

(b) Find the reaction components at the supports of a symmetrical parabolic fixed arch 20 m span and 3 m central rise when it is subjected to a uniformly distributed load of 2 kN/m over the left half span.

14. (a) A continuous beam ABC 24 in long is fixed at A, simply supported at B and C. The intermediate support B is at 12 in from A and sinks by 30 mm. The span AB carries a uniformly distributed load of 3 kN/m and the span BC carries a point load of 24 kN at 8 m from C. Analyze the beam by slope deflection method and draw the shearing force and bending moment diagrams. Take the flexural rigidity EI as 40000 kN — m² and is constant throughout.

Or

(b) Analyze the portal frame shown in Fig.Q.14.(b) by slope deflection method and draw the bending moment diagram.

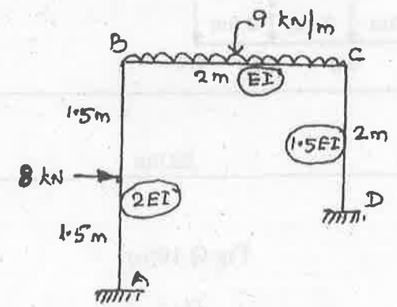


Fig. Q.14.(b)

15. (a) Analyse the portal frame shown in Fig.Q.15(a) using moment Distribution Method.

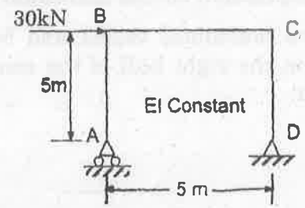


Fig.Q.15(a)

Or

15. (a) A continuous beam ABC 24 m long is fixed at A, simply supported at B and C. The intermediate support B is at 12 m from A and sinks by 30 mm. The span AB carries a uniformly distributed load of 3 kN/m and the span BC is subjected to a point load of 24 kN at 8 m from C. Analyze the beam by moment distribution method and draw the shearing force and bending moment diagrams. Take the flexural rigidity EI as 40,000 kN-m² and is constant throughout.

Or

(b) Analyze the frame shown in figure Q.15 (b) by moment distribution method using Naylor's simplification and draw the bending moment diagram.

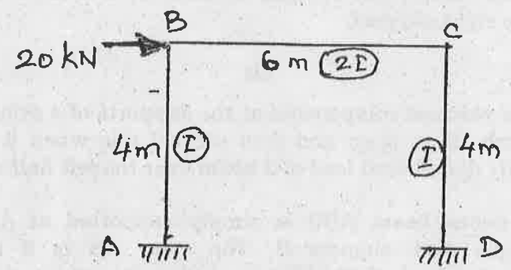


Fig Q. 15 (b)

Reg. No. : | | | | | | | | | | | | |

Question Paper Code : 80209

B.E./B.Tech. DEGREE EXAMINATION, NOVEMBER/DECEMBER 2016.

Fifth Semester

Civil Engineering

CE 6501 — STRUCTURAL ANALYSIS – I

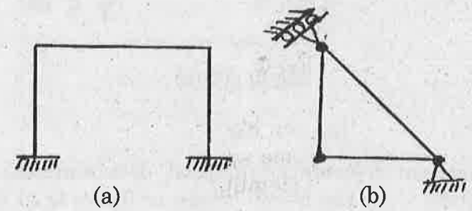
(Regulations 2013)

Time : Three hours Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. Find the degree of static indeterminacy for the following structures and specify whether the structure is stable or not.



(a) (b)

2. Determine the prop reaction of a propped cantilever using energy method when it is subjected to a uniformly distributed load over the entire span.

3. What are the uses of influence lines?

4. State: Muller Breslau's principle.

5. What is the value of horizontal thrust at the supports of a three hinged symmetrical parabolic arch of span "l" and central rise 'h', when it is subjected to a uniformly distributed downward load "w" per unit horizontal length over the right half span?

6. Name any two methods available for the analysis of two hinged arches.

7. Write the generalized form of slope – deflection equation with necessary explanation.

8. A propped cantilever of span 6 m is subjected to a uniformly distributed load of 6 kN/m over the entire span. Using slope deflection method, determine the slope at B. Take the flexural rigidity EI as 9000 kN-m².

9. A continuous beam ABC of length 2L (with uniform flexural rigidity EI) is simply supported at the ends A and C and continuous over the support B at mid-length. Using moment distribution method, determine the moment at the support B, if it subjected to a uniformly distributed load 'w' throughout the length.

10. What is meant by distribution factor?

PART B — (5 × 16 = 80 marks)

11. (a) The frame shown in figure Q.11 (a) is pin jointed to rigid supports at A and B and the joints C and D are also pinned. The diagonals AD and BC act independently and the members are all of the same cross sectional area and material. ABC and BCD are equilateral triangles. Using energy method, find the forces in all the members if a load of 5 kN is hung at D.

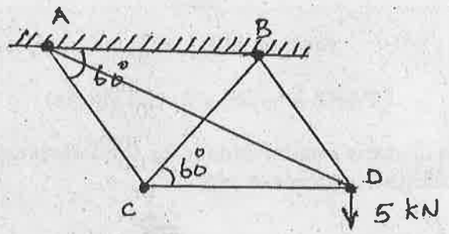


Fig Q. 11 (a)

Or

(b) Using consistent deformation method, determine the horizontal reaction at the support C for the frame shown in figure Q.11 (b). Flexural rigidity EI is constant for both the members.

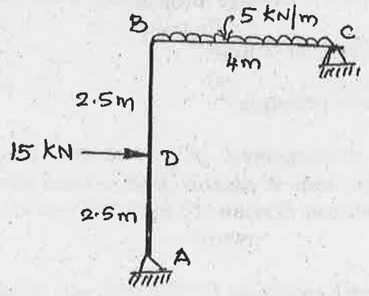


Fig Q. 11 (b)

12. (a) A continuous beam ABC is simply resting on supports A and C, continuous over the support B and has an internal hinge (D) at 3 m from A. The span AB is 7 m and the span BC is 10 m. Draw influence lines for reactions at A and B.

Or

(b) Draw influence line for shearing force at 4 m from the propped end of a propped cantilever of span 7 m. Calculate the ordinates at every 1 m.

13. (a) A three hinged parabolic arch of span 20 m has its crown 9 m high from the left support and 4 m higher than the right support. The crown of the arch is at a horizontal distance of 12 m from the left support and 8 m from the right support. The arch is subjected to a uniformly distributed load of 3 kN/m over a length of 14 m from the right support. Find the horizontal thrust and bending moment at a horizontal distance of 4 m from the right support.

Or

(b) Find the reaction components at the supports of a symmetrical parabolic fixed arch 20 m span and 3 m central rise when it is subjected to a uniformly distributed load of 2 kN/m over the left half span.

14. (a) A continuous beam ABC is simply supported at A, fixed at C and continuous over support B. The span AB is 6 m and carries a concentrated load of 60 kN at its mid-span and the span BC is 8 m and carries a uniformly-distributed load of 10 kN/m. Take the flexural rigidity for portion AB as 2EI and that for portion BC as EI. Analyze the beam by slope deflection method and draw the shearing force and bending moment diagrams.

Or

(b) Analyze the portal frame shown in Fig.Q.14 (b) by slope deflection method and draw the bending moment diagram.

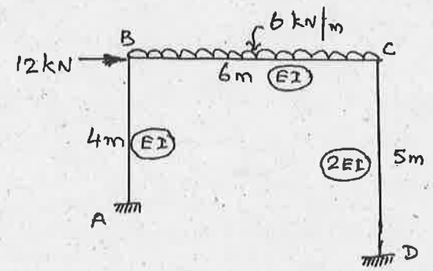


Fig Q. 14 (b)

b) Draw the bending moment diagram for the continuous beam shown in Fig. 15.b. by moment distribution method.

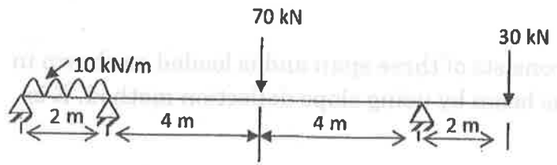


Fig. Q. No.15. b.

PART – C **(1×15=15 Marks)**

16. a) A train of 5 wheel loads crosses a simply supported beam of span 22.5 m. Using influence lines calculate the maximum positive and negative shear forces at mid span. And absolute maximum bending moment anywhere in the span. **15**

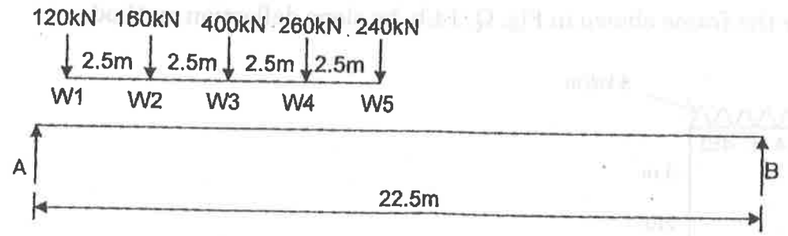


Fig. Q. No.16. a.

(OR)

b) A two hinged parabolic arch of span L and rise R carries a UDL of w/m run over the left hand half of the span. The moment of inertia of the arch rib varies as the secant of the slope of the rib axis.

a) Obtain the expression for the horizontal thrust H. **(10)**

b) Calculate the horizontal thrust and bending moment at quarter span point on the right half of the span if l = 20 m, r = 4 m and w = 20 kN/m. **(5)**

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Reg. No. : | | | | | | | | | | | | | |

Question Paper Code : 50279

B.E./B.Tech. DEGREE EXAMINATION, NOVEMBER/DECEMBER 2017
Fifth Semester
Civil Engineering
CE 6501 – STRUCTURAL ANALYSIS – I
(Regulations 2013)

Time : Three Hours Maximum : 100 Marks

Answer ALL questions.

PART – A **(10×2=20 Marks)**

1. Calculate degree of indeterminacy of propped cantilever beam.
2. Define static indeterminacy.
3. What are the uses of influence lines ?
4. What is meant by Begg's deformeter ?
5. What are the advantages of three hinged semi circular arch ?
6. How do you do account settlement effects in arches ?
7. Distinguish between Sway type and Non-sway type problems.
8. Write the advantages of slope deflection method.
9. Define stiffness and carry over factor in moment distribution method.
10. What is meant by the term Carry over factor ?

PART – B **(5×13=65 Marks)**

11. a) Find the forces in the members of the truss shown in Figure Q. 11.a. The cross sectional area and Young's modulus of all the members are same.

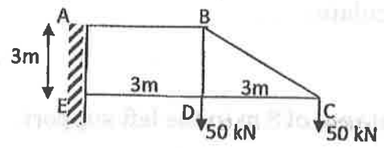


Fig.Q. No. 11.a.

(OR)

b) Analyse the truss shown in Figure Q. 11 (b) by consistent deformation method. Assume that the cross sectional area of all the members are same.

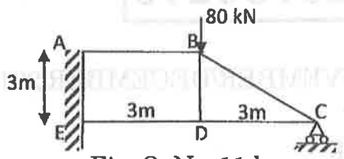


Fig. Q. No. 11.b.

12. a) Using Muller Breslau principle, draw the influence line for the bending moment at D, the middle point of span BC of a continuous beam shown in Fig. Q. No. 12.a. Compute the ordinates at 1 m interval. Determine the maximum hogging bending moment in the beam when two concentrated loads of 6kN each and separated by a distance 1 m passes through the beam from left to right.

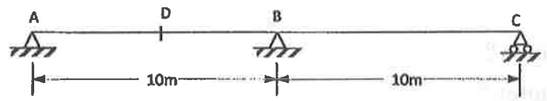


Fig. Q. No.12. a.

(OR)

b) Draw the IL for force in member BC and CI for the truss shown in Figure Q. No. 12 (b). The height of the truss is 8 m and each segment is 8 m long.

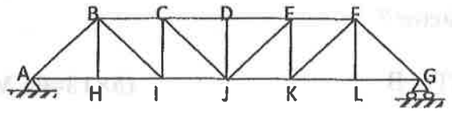


Fig. Q. No.12. b.

13. a) A symmetrical three hinged parabolic arch of span 30 m and rise 8 m carries an UDL of 40 kN/m over the left half of the span. The hinges are provided at the supports and at the center of the arch. Calculate :
   a) Reactions of the supports.
   b) Bending moment.
   c) Radial shear and normal thrust at a distance of 8 m in the left support.

(OR)

b) A three hinged arch is circular, 25 m in span with a central rise of 5 m. It is loaded with a concentrated load of 10 kN at 7.5 m from the left hand hinge. Find the (a) Horizontal thrust. (b) Reaction at each end hinge. (c) Bending moment under the load.

14. a) A continuous beam ABCD consists of three span and is loaded as shown in Fig. Q. No. 14.a. Analyze the beam by using slope deflection method. E is constant throughout.

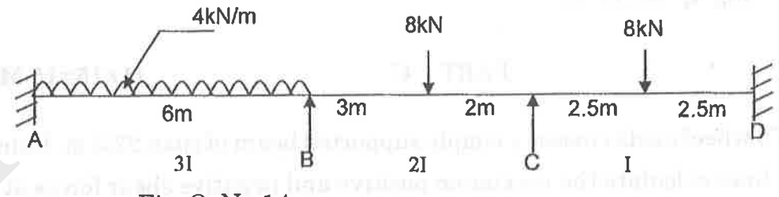


Fig. Q. No.14. a.

(OR)

b) Analyse the frame shown in Fig. Q. 14.b. by slope deflection method.

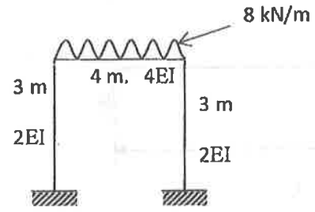


Fig. Q. No.14. b.

15. a) Analyse the frame shown in Fig. 15.a by moment distribution method.

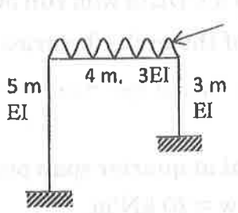
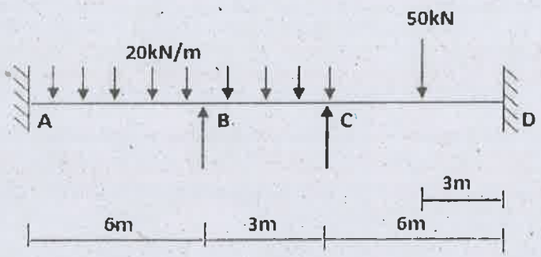


Fig. 15.a.

(OR)

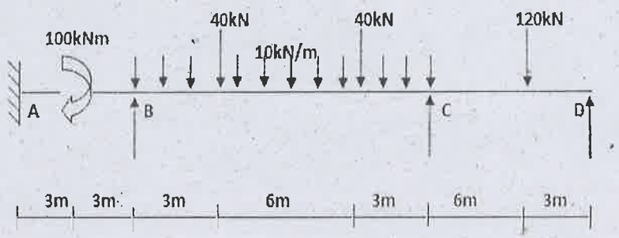
PART C — (1 × 15 = 15 marks)

16. (a) Analyse the continuous beam ABCD by slope deflection method and find the end moments. Support B sinks by 10 mm. $E = 2 \times 10^5 N/mm^2$ and $I = 16 \times 10^7 mm^4$.



Or

(b) Analyse the continuous beam loaded as shown in fig. by moment distribution method and find final moments.



02/11/18

Reg. No. :

Question Paper Code : 20270

B.E./B.Tech. DEGREE EXAMINATION, NOVEMBER/DECEMBER 2018.

Fifth Semester

Civil Engineering

CE 6501 – STRUCTURAL ANALYSIS – I

(Regulations 2013)

(Common to PTCE 6501 – Structural Analysis – I for B.E. (Part-Time) – Third Semester – Civil Engineering – Regulations – 2014)

Time : Three hours Maximum : 100 marks

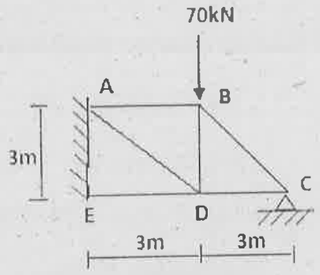
Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. List the types of indeterminate beams.
2. State the principle of consistent deformation.
3. State Muller Breslau's principle.
4. What are the three types of connections possible with the model used with Begg's deformeter?
5. What is the degree of static indeterminancy of a three hinged parabolic arch?
6. Explain with the aid of a sketch, the normal thrust and radial shear in an arch rib.
7. State the assumptions of slope deflection equations.
8. Mention any three reasons due to which sway may occur in portal frames.
9. What is the carry over factor if the far end is hinged?
10. In a member AB, if a moment of –30 kNm is applied at A, what is the moment carried over to B, if end B is fixed?

PART B — (5 × 13 = 65 marks)

11. (a) Analyse the truss shown in fig and find the redundant reaction at C by consistent deformation method. Assuming the cross sectional area of all members are same.



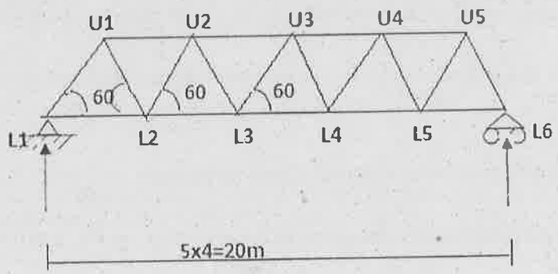
Or

(b) Determine the reaction components by consistent deformation method in the Propped cantilever beam ABC supported at B. Span AB = 4 m, BC = 2 m. Two concentrated loads of 30 kN acts at free end C and 80 kN at 2 m from the fixed end A.

12. (a) A simply supported beam has a span of 20 m. Uniformly distributed load of 40 kN/m and 8 m long crosses the girder from left to right. Draw the influence line diagram for shear force and bending moment at a section 11 m from left end. Calculate maximum shear force and bending moment at this section.

Or

(b) Determine the maximum forces in the members U_2U_3 and L_3U_3 of the bridge truss shown in fig if uniformly distributed load of 60 kN/m longer than the span traverses along the bottom chord members.



13. (a) A three hinged arch of span 50 m and rise 10 m carries an uniformly distributed load of 40 kN/m on the left half of the span and 150 kN at 25 m from right end. Find the horizontal thrust.

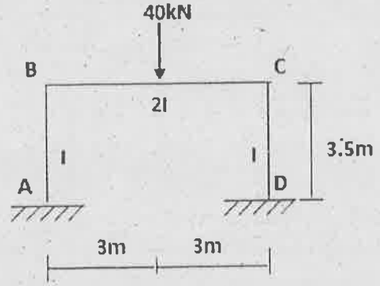
Or

(b) A symmetrical three hinged parabolic arch of span 40m and rise 10 m carries an uniformly distributed load of 30 kN/m over the left half of the span. Calculate the reactions at the supports. Calculate the bending moment, radial shear and normal thrust at 15m from left support.

14. (a) Analyse the beam by the slope deflection method and draw the BMD. A beam ABCD is fixed at A and D and simply supported at B and C. Span AB = 6 m, BC = 6 m, CD = 6 m, subjected to uniformly distributed load of 30 kN/m oyer entire span.

Or

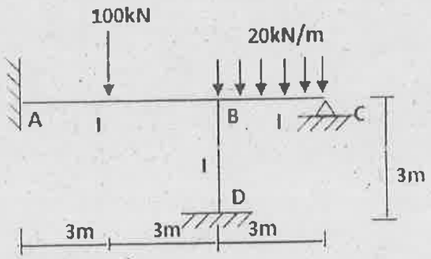
(b) Analyse the portal frame shown in fig by the slope deflection method and draw BMD.



15. (a) Determine the final moments in the continuous beam ABC subjected to 40 kN at 2 m from A and uniformly distributed load of 35 kN/m over the whole span BC. Span AB = 6 m, BC = 5 m. I is uniform. Use moment distribution method.

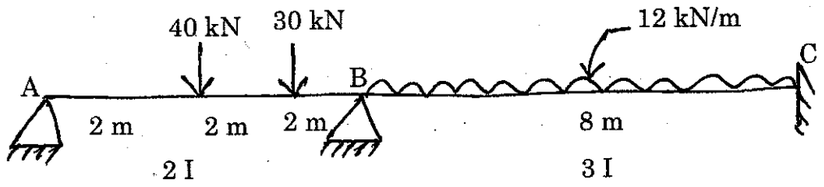
Or

(b) Determine the final moments in the beam ABC supported by the column BD and is loaded as shown in fig. Use moment distribution method.



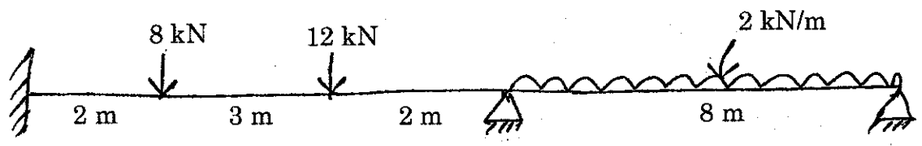
PART – C (1×15=15 Marks).

16. a) Analyse the continuous beam shown in fig. Q. No. 16 (a) and plot the BMD and SFD. Use Moment distribution method.



(OR)

b) Draw the BMD and SFD of the beam shown in fig. Q. 16 (b) by slope deflection method.



19/11/19/FN

Reg. No. :

Question Paper Code : 91304

B.E./B.Tech. DEGREE EXAMINATIONS, NOVEMBER/DECEMBER 2019
Fifth Semester
Civil Engineering
CE 6501 – STRUCTURAL ANALYSIS – I
(Regulations 2013)

Time : Three Hours Maximum : 100 Marks

Answer ALL questions.

PART – A (10×2=20 Marks)

1. Distinguish between static indeterminacy and kinematic indeterminacy.
2. Brief the method of consistent deformation for the analysis of a propped cantilever.
3. Sketch qualitatively the influence line for shear at D for the beam in Fig. Q. No. 3.

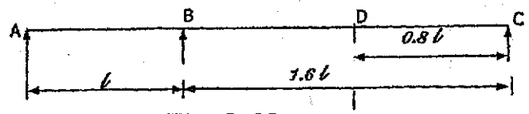


Fig. Q. No. 3

4. Draw the influence line for shear to the left of B for the overhanging beam shown in Fig. Q. No. 4.

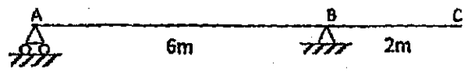


Fig. Q. No. 4

5. What is the value of horizontal thrust at the supports of a three hinged symmetrical parabolic arch of span "l" and central rise 'h', when it is subjected to a uniformly distributed downward load "w" per unit horizontal length over the right half span ?
6. Name any two methods available for the analysis of two hinged arches.
7. Distinguish between Sway type and Non-sway type problems.
8. Write the advantages of slope deflection method.
9. State the reasons for a portal frame to sway.
10. Specify the condition to use the Naylor's simplification in moment distribution method for the analysis of frames.

PART – B (5×13=65 Marks)

11. a) Find the forces in the members of the truss shown in figure 11(a). The cross sectional area and Young's modulus of all the members are the same.

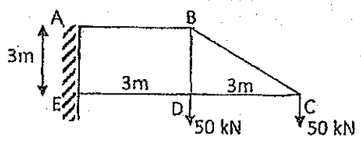


Fig. Q. No. 11 (a)

(OR)

b) Analyse the truss shown in figure 11(b) by Consistent Deformation Method. Assume that the cross sectional area of all the members are same.

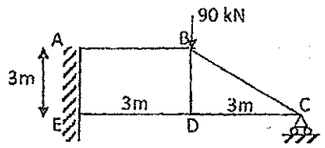


Fig. Q. No. 11 (b)

12. a) A continuous beam ABC is simply resting on supports A and C, continuous over the support B and has an internal hinge (D) at 3 m from A. The span AB is 7 m and the span BC is 10 m. Draw influence lines for reactions at A and B.

(OR)

b) Draw influence line for shearing force at 4 m from the propped end of a propped cantilever of span 7 m. Calculate the ordinates at every 1 m.

13. a) A uniformly distributed load of 6 kN/m covers the left half span of a three hinged symmetrical parabolic arch of span 24 m and central rise 4 m. Determine the horizontal thrust and also the bending moment, shearing force and normal thrust at the loaded quarter span.

(OR)

b) A symmetrical two hinged parabolic arch has a span of 50 m and central rise 5 m. It carries a concentrated vertical load of 20 kN at 10 m from left support in addition to a vertical load of 30 kN at the crown. Draw the bending moment diagram for the arch and also determine the radial shear and normal thrust at 12.5 m from the left support.

14. a) A continuous beam ABCD consists of three span and is loaded as shown in Fig. Q. No. 14 (a). Analyze the beam by using slope deflection method. E is constant throughout.

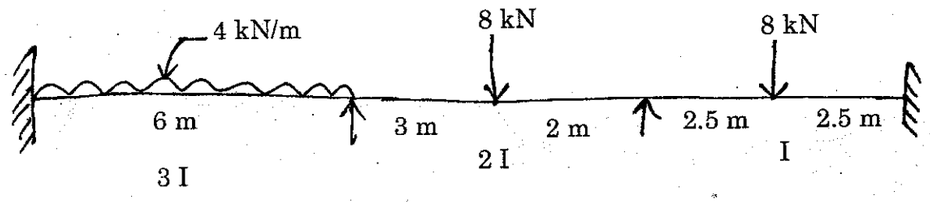


Fig. Q. No. 14 (a)

(OR)

b) Analyse the frame shown in Fig. Q. 14 (b) by slope deflection method.

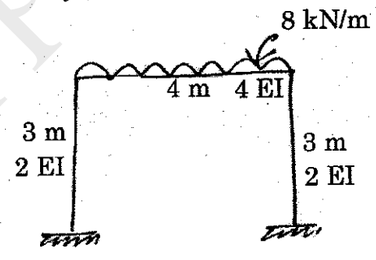


Fig. Q. No. 14 (b)

15. a) A continuous beam ABC is simply supported at A, fixed at C and continuous over support B. The span AB is 6 m and carries a concentrated load of 60 kN at its mid-span and the span BC is 8 m and carries a uniformly distributed load of 10 kN/m. Take the flexural rigidity for portion AB as 2EI and that for portion BC as EI. Analyze the beam by moment distribution method and draw the shearing force and bending moment diagrams.

(OR)

b) Analyze the frame shown in Fig. Q. 15 (b) by moment distribution method and draw the bending moment diagram.

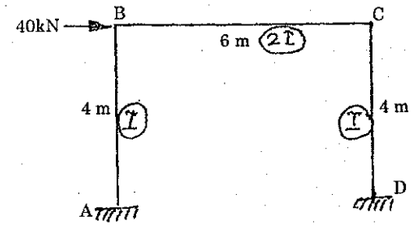


Fig. Q. No. 15 (b)