Code.No: 07A50104

R07

SET-1

III B.TECH – I SEM EXAMINATIONS, NOVEMBER - 2010
STRUCTURAL ANALYSIS – II
(CIVIL ENGINEERING)

Time: 3hours **Max.Marks:80**

Answer any FIVE questions
All questions carry equal marks
- - -

1. A three hinged parabolic arch has a span of 22 m with central rise of 4m. It is loaded with a uniformly distributed load of 6 kN/m on the left 8m length from the left support. Calculate,
   a) Direction and magnitude of reaction at the hinge.
   b) The bending moment, normal thrust and radial shear at 4m and 16m from the left support. Draw bending moment diagram. [16]

2. A uniformly distributed load of 23 kN/m covers a 8m length of the span of a two-hinged parabolic arch as shown in Fig.1. The moment of inertia of the arch section varies as the secant of the slope of the arch. The span and rise are 25m and 4m respectively. Draw the bending moment diagram and determine the position of maximum bending moment. [16]

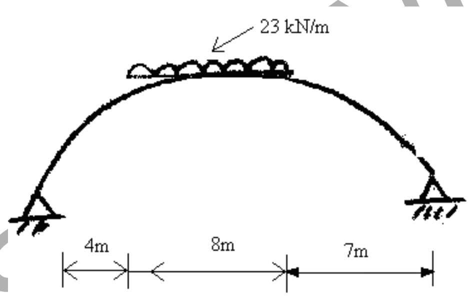

Fig .1.

3. Analyze the frame shown in Fig.2 by Cantilever method. Draw the bending moment diagram and sketch elastic curve. Cross-sectional area of all columns is equal. [16]

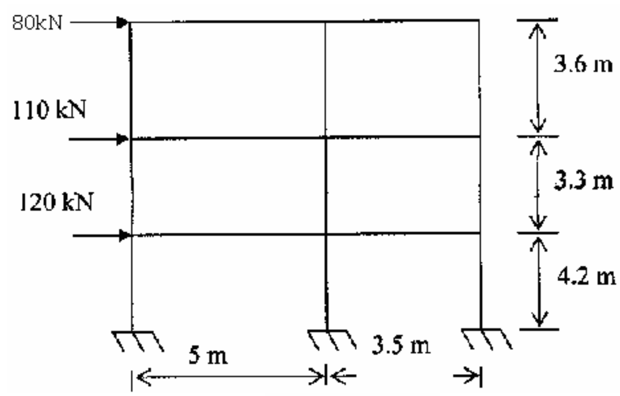

Fig .2.

4. Analyze the rigid frame shown in Fig.3 by slope-deflection method. Draw bending moment diagram and hence sketch the elastic curve. [16]

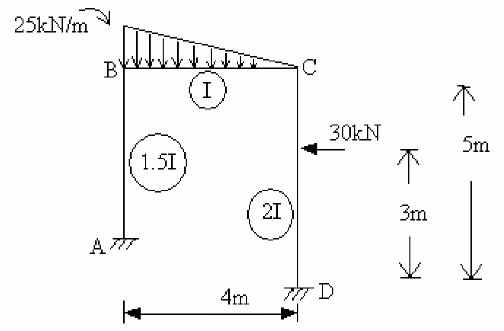

Fig .3.

5. A frame ABCD shown in Fig.4 is hinged at A and the end D is fixed, and the joints A and C are rigid. The column CD is subjected to a horizontal loading of 35 kN/m. A concentrated load of 75 kN acts on BC at 1m from B. Analyze the frame using Moment distribution method and hence sketch the elastic curve. [16]

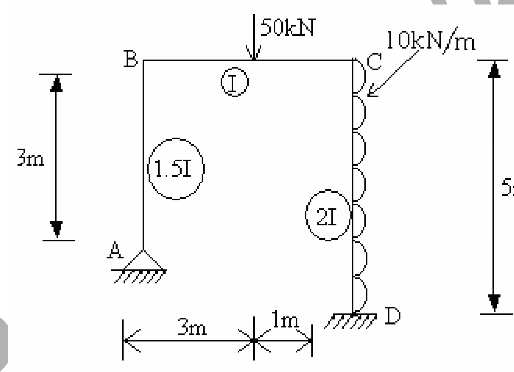

Fig .4.

6. A three span continuous beam ABCD has hinged support at A and roller supports at B, C and D. The span AB is subjected to a uniformly distributed load of 25kN/m while the spans BC and CD are subjected to uniformly distributed loads of 50kN/m and 15kN/m respectively. The continuous beam ABCD has constant flexural rigidity. Sketch shear force and bending moment diagrams marking the location and magnitude of maximum bending moments and points of contra-flexure. Also draw elastic curve for the continuous beam. Use Kani's method. [16]

7. Analyze the continuous beam shown in Fig.5, using flexibility method if the download settlement of supports B and C in km units are 2700/EI and 1200/EI respectively. Draw the bending moment and shear force diagrams. EI is constant. [16]

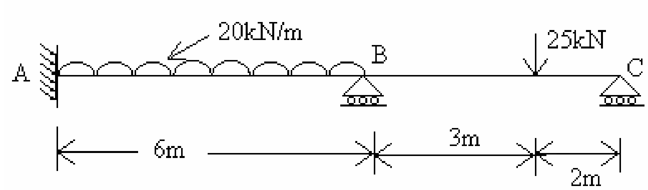

Fig .5.

8. Analyze the continuous beam shown in Fig.6 by stiffness method. Draw bending moment diagram and elastic curve. [16]

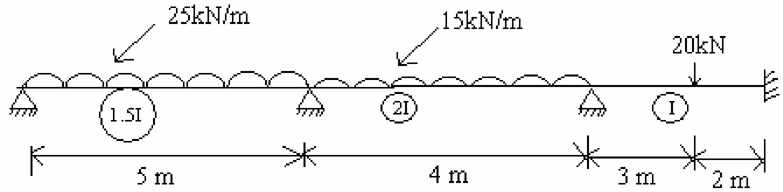

Fig .6.

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Code.No: 07A50104 | R07 | SET-2

III B.TECH – I SEM EXAMINATIONS, NOVEMBER - 2010
STRUCTURAL ANALYSIS – II
(CIVIL ENGINEERING)

Time: 3hours **Max.Marks:80**

Answer any FIVE questions
All questions carry equal marks
- - -

1. Analyze the frame shown in Fig.1 by Portal method. Draw the bending moment diagram and sketch elastic curve. Cross-sectional area of all columns is equal. [16]

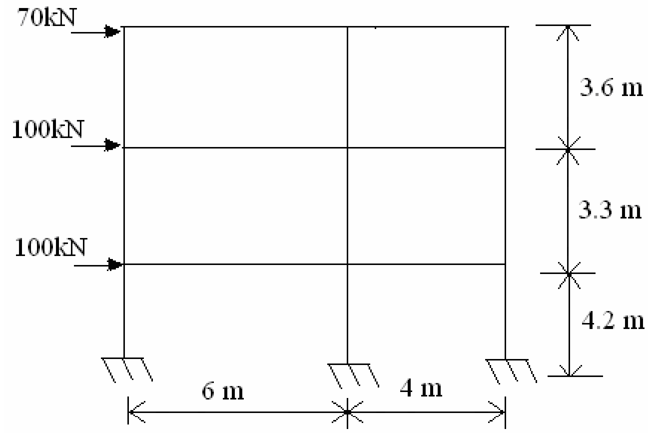

Fig .1.

2. A two-hinged parabolic arch of span 50m and central rise of 12m is loaded over left half of the span with uniformly distributed load of intensity 22 kN/m and a point load of 70 kN at 16m from right support. The moment of inertia of the arch varies as the secant of the slope of the arch axis. Neglecting rib shortening effect, determine the following:
   a) The horizontal thrust at the supports.
   b) Maximum sagging and hogging bending moment values.
   c) Radial shear and normal thrust in the arch section situated horizontally at 20m from the left support. [16]

3. A portal frame ABCD is fixed at A and D and has rigid joints at B and C. The column AB is 5m long and the column CD is 4m long. The horizontal beam BC is loaded with uniformly distributed load of intensity of 55 kN/m. Moment of inertia of the columns AB and CD is 2I and 1.5I respectively. Moment of inertia of beam BC is I. Draw bending moment diagram and hence sketch the elastic curve. Use slope-deflection method. [16]

4. Analyze the frame shown in Fig.2 by Moment distribution method. Draw the bending moment diagram and hence sketch elastic curve. [16]

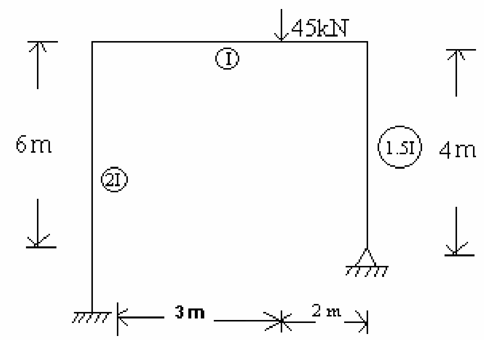

Fig .2.

5. Analyze the portal frame shown in Fig.3, by Kani's rotations contribution method. Draw the bending moment diagram. Sketch the elastic curve. [16]

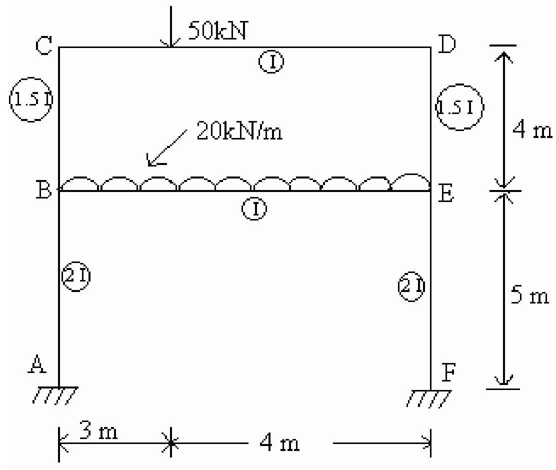

Fig .3.

6. Analyze the continuous beam shown in Fig.4, using flexibility method if the downward settlement of supports B and C in km units are 3300/Ei and 2100/EI respectively. Draw the bending moment and shear force diagrams. EI is constant. [16]

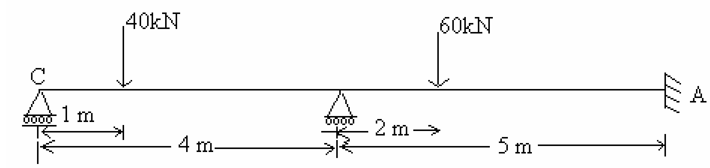

Fig 4.

7. Analyze the continuous beam shown in Fig.5 by stiffness method. Draw bending moment diagram and elastic curve. [16]

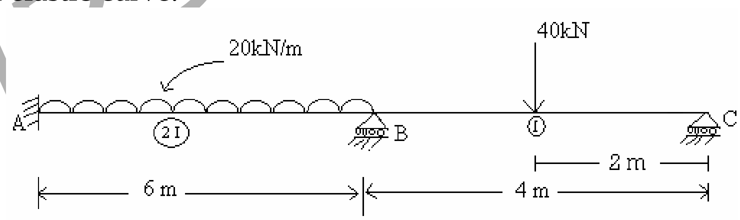

Fig .5.

8. A three hinged parabolic arch has a span of 22m with central rise of 4m. It is loaded with a uniformly distributed load of 6kN/m on the left 8m length from the left support. Calculate

a) Direction and magnitude of reaction at the hinge.

b) The bending moment, normal thrust and radial shear at 4m and 16m from the left support. Draw bending moment diagram. [16]

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III B.TECH – I SEM EXAMINATIONS, NOVEMBER - 2010
STRUCTURAL ANALYSIS – II
(CIVIL ENGINEERING)

Time: 3hours **Max.Marks:80**

Answer any FIVE questions
All questions carry equal marks
- - -

1. A portal frame ABCD is fixed at A and D and has rigid joints at B and C. The column AB is 3.5m long and the column CD is 2.5m long. The horizontal beam BC is loaded with uniformly distributed load of intensity of 65kNm. Moment of inertia of the columns AB and CD is 2I and 1.5I respectively. Moment of inertia of beam BC is I. Draw bending moment diagram and hence sketch the elastic curve. Use slope-deflection method. [16]

2. A two-hinged parabolic arch of span 60m and central rise of 15m is loaded over left half of the span with uniformly distributed load of intensity 25 kN/m and a point load of 90kN at 18 m from right support. The moment of inertia of the arch varies as the secant of the slope of the arch axis. Neglecting rib shortening effect, determine the following:
a) The horizontal thrust at the supports.
b) Maximum sagging and hogging bending moment values.
c) Radial shear and normal thrust in the arch section situated horizontally at 22m from the left support. [16]

3. Analyze the frame shown in Fig.1 by Portal method. Draw the bending moment diagram and hence sketch elastic curve. Cross-sectional area of all columns is equal. [16]

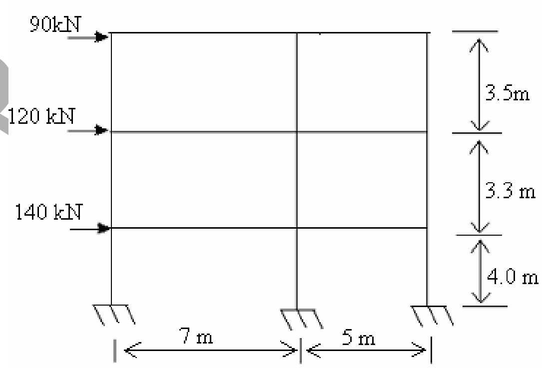

Fig .1.

4. A three hinged symmetric circular arch has a span of 28m with central rise of 5m. Determine the bending moment, normal thrust and radial shear at 7m from left support, if the arch is subjected to a uniformly distributed load of 25kN/m over left half portion and a concentrated load of 65kN at 20m from the left support. Draw bending moment diagram. [16]

5. Analyze the frame shown in Fig.2 by Moment distribution method. Draw the bending moment diagram and hence sketch elastic curve. [16]

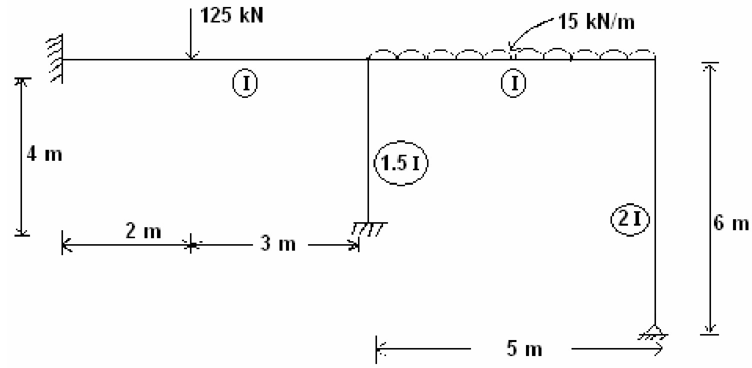

Fig 2.

6. Analyze the portal frame shown in Fig.3 by Kani's rotations contribution method. Draw the bending moment diagram. Sketch the elastic curve. [16]

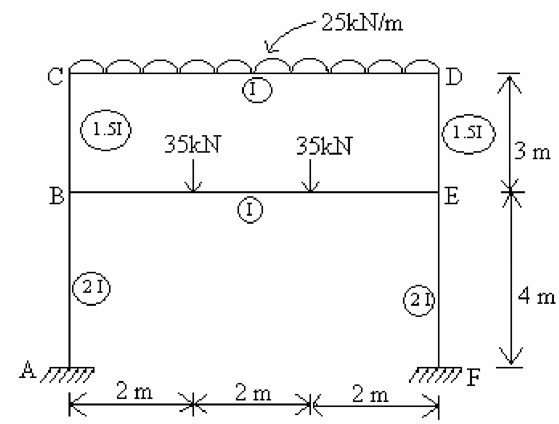

Fig .3.

7. Analyze the continuous beam shown in Fig.4, using flexibility method if the downward settlement of supports B and C in km units are 1800/EI and 700/EI respectively. Draw the bending moment and shear force diagrams. EI is constant. [16]

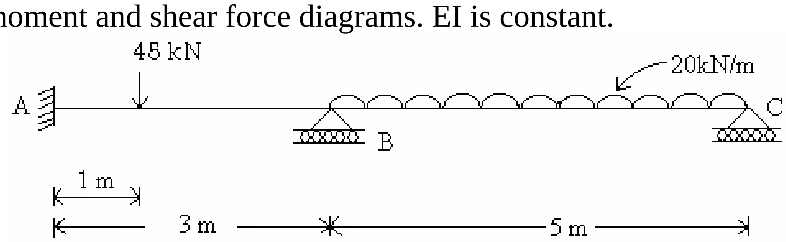

Fig .4.

8. Analyze the continuous beam shown in Fig.5 by stiffness method. Draw bending moment diagram and elastic curve. [16]

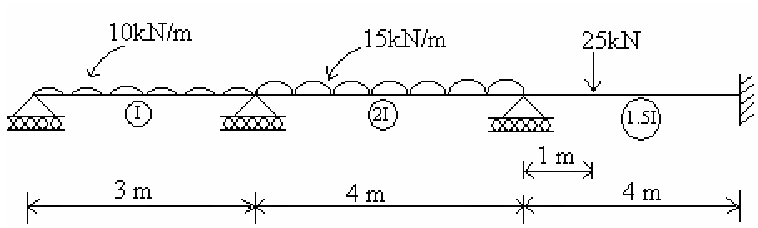

Fig .5.

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Code.No: 07A50104

R07

SET-4

III B.TECH – I SEM EXAMINATIONS, NOVEMBER - 2010
STRUCTURAL ANALYSIS – II
(CIVIL ENGINEERING)

Time: 3hours **Max.Marks:80**

Answer any FIVE questions
All questions carry equal marks
- - -

1. A two span continuous beam ABC is fixed at A and C. It is continuous over the simple support B in between A and C. Span AB is 5m. While span BC is 6m. It is subjected to a concentrated load of 60 kN at 3m from the fixed support A, and the span BC is subjected to a uniformly distributed load of 10kN/m. The ratio of flexural rigidity of span BC to span AB is 1.5. Sketch shear force and bending moment diagrams marking the location and magnitude of maximum bending moment and points of contra-flexure. Also draw elastic curve for the continuous beam. Use Kani's method. [16]

2. A two-hinged parabolic arch of span 26m and central rise of 3.5m is uniformly loaded over left half of the span with 25 kN/m and a concentrated load of 65 kN at the crown. [16]

3. Analyse the frame shown in Fig.1 by Cantilever method. Draw the bending moment diagram and sketch elastic curve-sectional area of all columns is equal. [16]

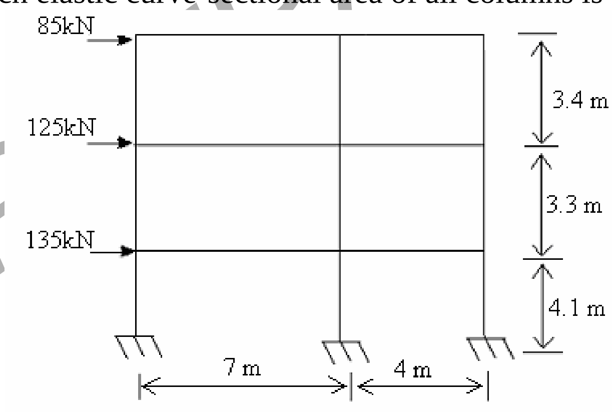

Fig .1.

4. Analyse the rigid frame shown in Fig.2 by slope-deflection method. Draw bending moment diagram and hence sketch the elastic curve. [16]

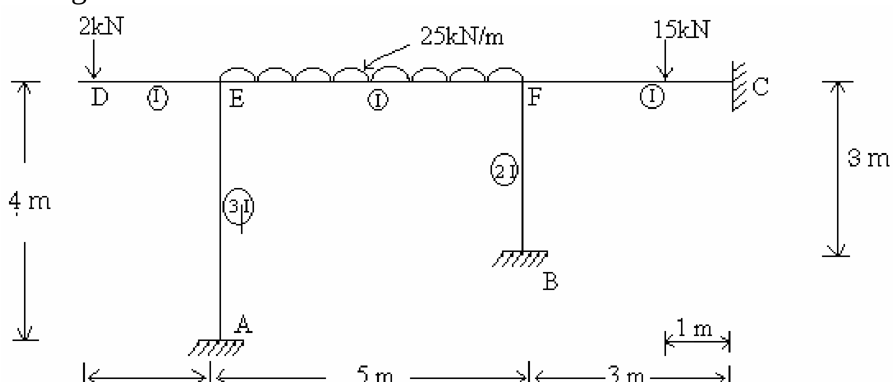

Fig.2

5. A frame ABCD shown in Fig.3 is hinged at A and the end D is fixed, and the joints B and C are rigid. The column CD is subjected to a horizontal loading of 25 kN/m. A concentrated load of 65 kN acts on BC at 1m from B. Analyse the frame using Moment distribution method and hence sketch the elastic curve. [16]

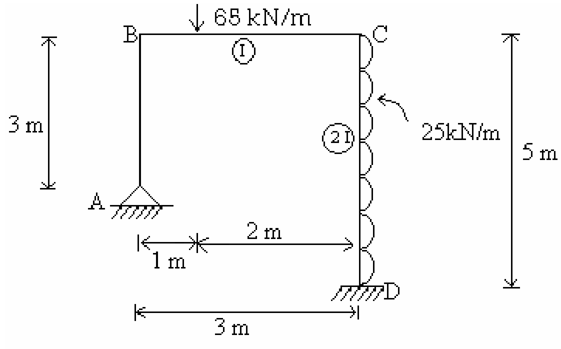

Fig .3.

6. A three-hinged parabolic arch has a span of 28 m with central rise of 5 m. Determine the bending moment, normal thrust and radial shear at 7m from left support, if the arch is subjected to a uniformly distributed load of 25 kN/m over left half portion and a concentrated load of 65kN at 20m from the support. [16]

7. Analyze the continuous beam shown in Fig.4, using flexibility method if the downward settlement of supports B and C in km units are 2000/EI and 1000/Ei respectively. Draw the bending moment and shear force diagrams. EI is constant. [16]

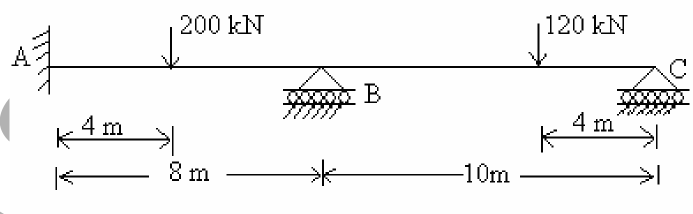

Fig .4.

8. Analyze the continuous beam shown in Fig.5 by stiffness method. Draw bending moment diagram and elastic curve. [16]

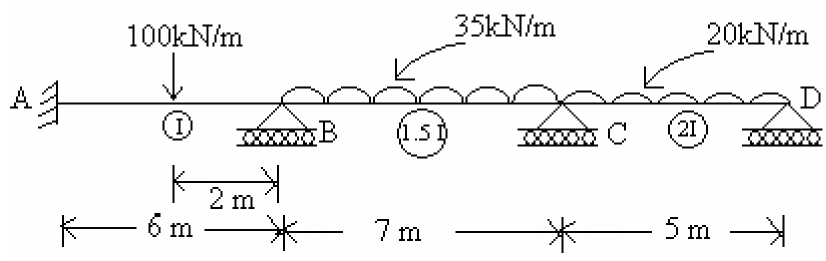

Fig .5.

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