Code.No: 07A40104 | R07 | SET-1

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

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

Answer any FIVE questions
All questions carry equal marks

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1. Analyze the propped cantilever beam shown in Fig.1 and draw shear force and bending moment diagrams. [16]

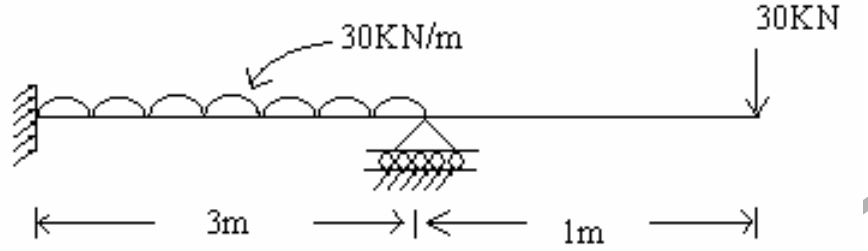

Fig.1

2. A beam of uniform section is fixed at its ends. It carries a concentrated load P at a distance of ¼ th span from left end. From first principles, find out the fixed end moments at the ends and hence draw shear force and bending moment diagrams. If in addition, there acts a concentrated load of double the magnitude of the first load but acts at the other ¼ th span point (from the right end), by how much percentage does the fixed end moment at the right and left ends increase? [16]

3. Analyze the continuous beam of constant flexural rigidity shown in Fig.2, using theorem of three moments. Draw shear force and bending moment diagrams. Mark the location of maximum bending moment and points of contraflexure and hence draw elastic curve. [16]

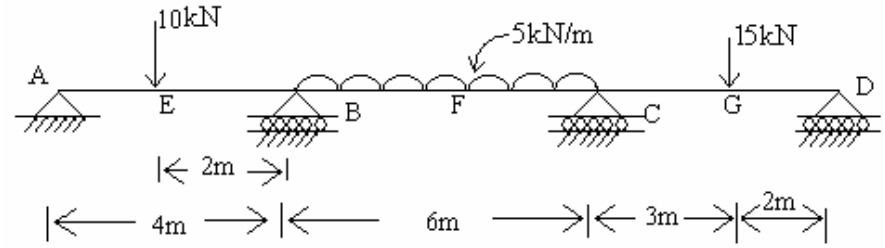

Fig.2

4. Analyze the continuous beam shown in Fig.3, using slope-deflection method. Draw bending moment diagram and hence sketch the elastic curve. [16]

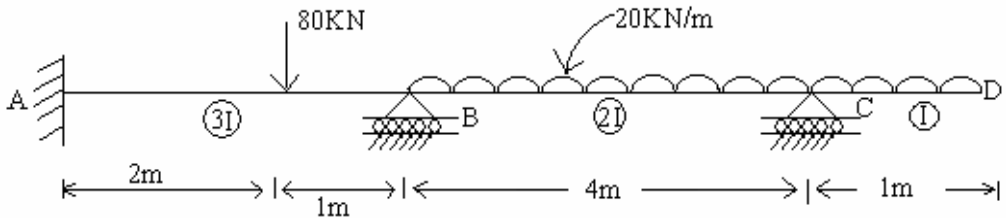

Fig.3

5. For the truss shown in Fig.4 determine by unit load method, vertical deflection at the joint B where 10 kN load is acting. Take cross-sectional area of all members as 2000 mm^2 and E = 200 GPa. [16]

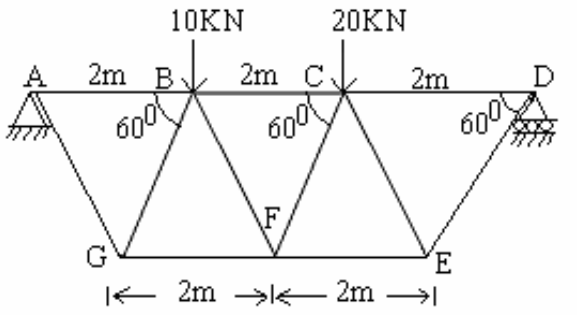

Fig.4

6. Two point loads of 9 kN and 5 kN each, spaced 4 m apart cross a girder of 18 m span with the 5 kN load leading from left to right. Find the value of maximum bending moment at a section 6 m from left support. Construct the absolute maximum shear force and bending moment diagrams. [16]

7. Determine the maximum forces in the members U_2L_2, U_2U_3, U_3L_3 and L_3L_4 of the bridge truss shown in Fig.5 if uniformly distributed load of 70 kN/m, longer than the span, traverses along the bottom chord members. [16]

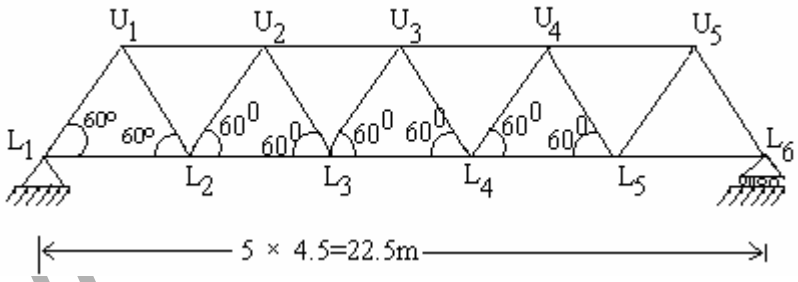

Fig.5

8. A pin-jointed truss shown in Fig.6 is hinged at supports A and D and is subjected to a horizontal force of 70 kN at C. Determine the forces developed in all the members of the truss. Assume cross-sectional area of all members as 5500 mm^2 and modulus of elasticity as 205 GPa. [16]

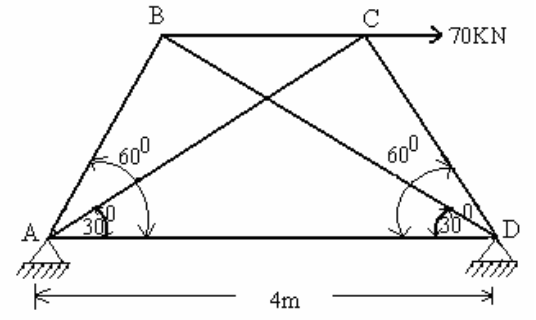

Fig.6

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Code.No: 07A40104 | R07 | SET-2

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

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

Answer any FIVE questions
All questions carry equal marks

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1. Analyze the propped cantilever beam shown in Fig.1 and draw shear force and bending moment diagrams. [16]

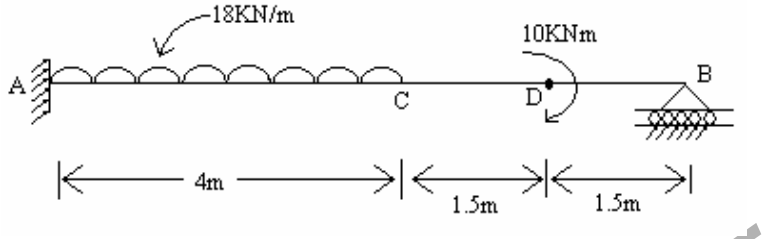

Fig.1

2. A beam fixed at its ends has a span of 9 m. It carries a uniformly distributed load of 20 kN/m extending from left support to a point 5 m from it. Calculate the fixed end moments. Draw the shear force and bending moment diagrams. Locate the distance of points of contraflexure from fixed ends. [16]

3. Analyze the continuous beam shown in Fig.2 using theorem of three moments. Draw shear force and bending moment diagrams. Mark the location of maximum bending moment and points of contraflexure and hence draw elastic curve. [16]

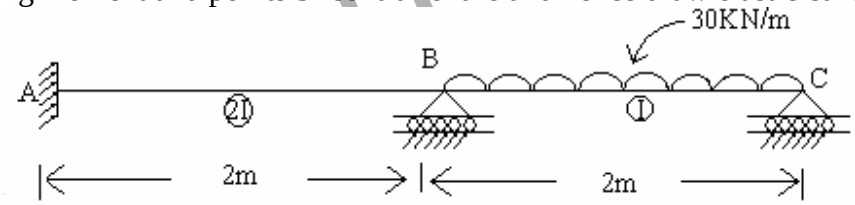

Fig.2

4. Analyze the continuous beam shown in Fig.3, using slope-deflection method. Draw bending moment diagram and hence sketch the elastic curve. [16]

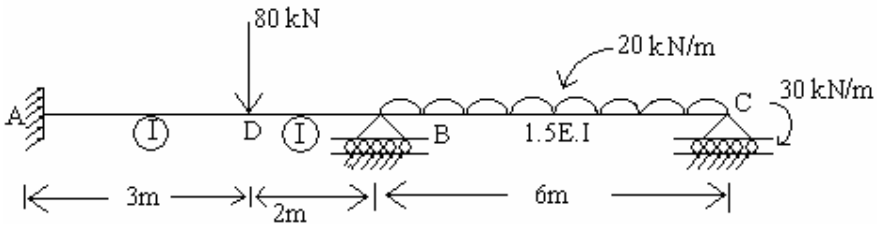

Fig.3

5. A steel beam of uniform cross-section is simply supported over a span of 10 m and carries concentrated loads of 50, 100 and 150 kN at distances of 2 m, 5 m and 6 m respectively from left support. Compute the deflection under 150 kN load using unit load method. EI = 400×10^4 kNm^2. [16]

Code.No: 07A40104	R07	SET-2

6. The system of concentrated loads shown in Fig.4 rolls from left to right on the girder of span 18 m, 45 kN load is leading the loads. For a section at 5 m left support, determine
a) Maximum bending moment and b) Maximum shear force. [16]

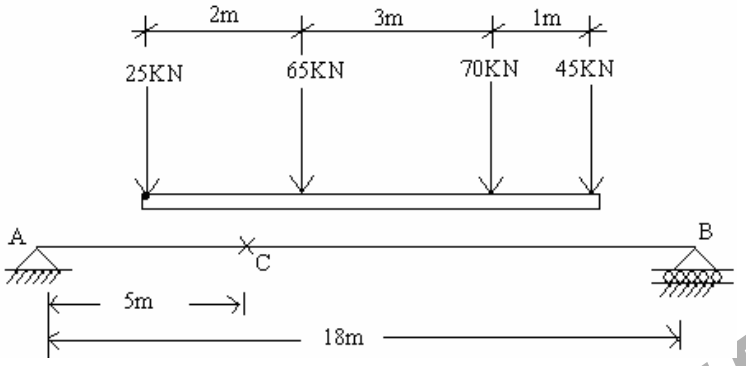

Fig.4

7. Draw the influence line diagram for forces in the members U_2L_3, U_3L_4, U_3U_4 and U_3L_3 of the frame shown in Fig.5 and find the maximum forces developed when uniformly distributed load of intensity 55 kN/m, longer than the span moves from left to right on the bottom chord. [16]

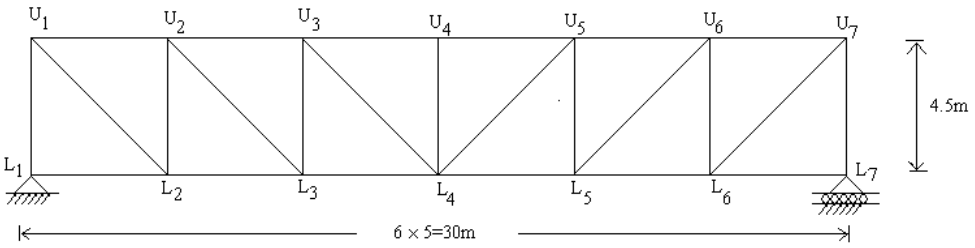

Fig.5

8. Determine the forces in all the members of the truss shown in Fig.6. Take cross-sectional areas for AD, BE and BC as 3500 mm^2 and for all other members as 2500 mm^2. Assume modulus of elasticity = 210 GPa. [16]

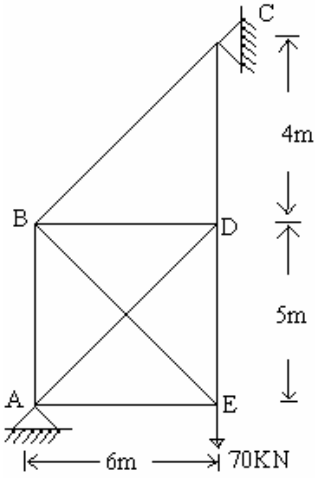

Fig.6

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Code.No: 07A40104 | R07 | SET-3

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

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

Answer any FIVE questions
All questions carry equal marks

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1. Analyze the propped cantilever bean shown in Fig.1 and draw shear force and bending moment diagrams. [16]

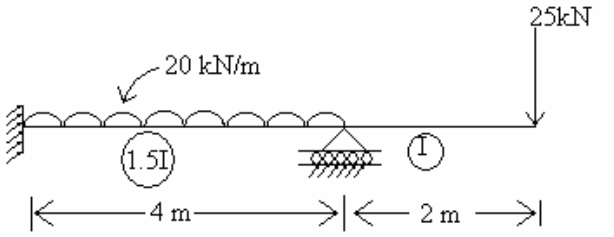

Fig.1

2. A beam of uniform section is fixed at its ends. It carries a concentrated load P at a distance of 1/3rd span from left end. From first principles, find out the fixed end moments at the ends and hence draw shear force and bending moment diagrams. If in addition, there acts a concentrated load of double the magnitude of the first load but acts at the other 1/3rd span point (from the right end), by how much percentage does the fixed end moment at the right and left ends increase? [16]

3. Analyze the continuous beam of constant flexural rigidity shown in Fig.2, using theorem of three moments. Draw shear force and bending moment diagrams. Mark the location of maximum bending moment and points of contra-flexure and hence draw elastic curve. [16]

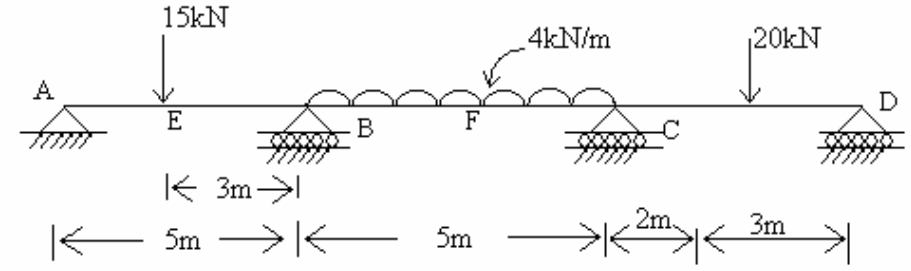

Fig.2

4. Analyze the continuous beam shown in Fig.3, using slope-deflection method. Draw bending moment diagram and hence sketch the elastic curve. [16]

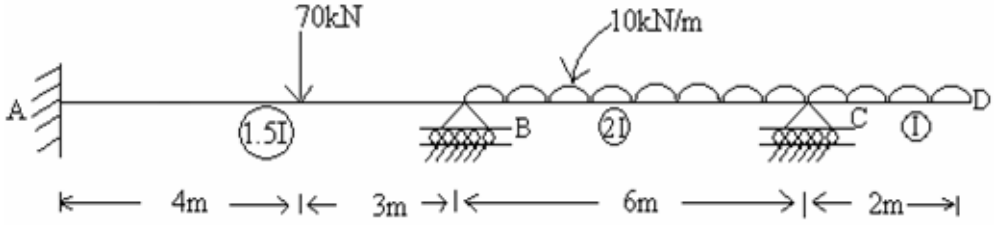

Fig.3

Code.No: 07A40104	R07	SET-3

5. For the truss shown in Fig.4, determine by unit load method, vertical deflection at the joint B where 20 kN load is acting. Take cross-sectional area of all members as 2300 mm^2 and E = 200 Gpa. [16]

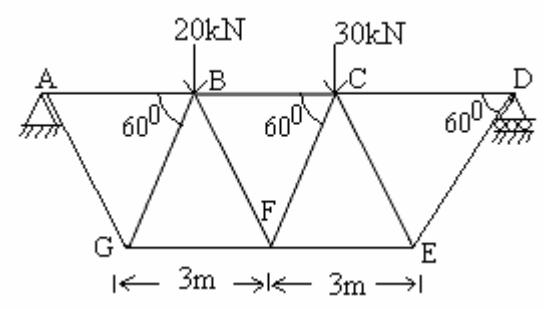

Fig.4

6. Two point loads of 18 kN and 12 kN each, spaced 4 m apart cross a girder of 20 m span with the 12 kN load leading from left to right. Find the value of maximum bending moment at a section 6 m from left support. Construct the absolute maximum shear force and bending moment diagrams. [16]

7. Determine the maximum force in the members U_1L_2, U_2U_3, U_3L_3 and L_3L_4 of the bride truss shown if Fig.5, if uniformly distributed load of 80 kN/m, longer than the span, traverses along the bottom chord members. [16]

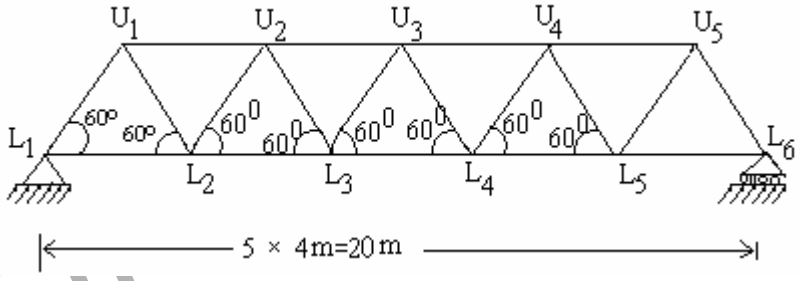

Fig.5

8. A pin-jointed truss shown in Fig.6 is hinged at supports A and D and is subjected to a horizontal force of 80 kN at C. Determine the forces developed in all the members of the truss. Assume cross-sectional area of all members as 5600 mm^2 and modulus of elasticity as 210 GPa. [16]

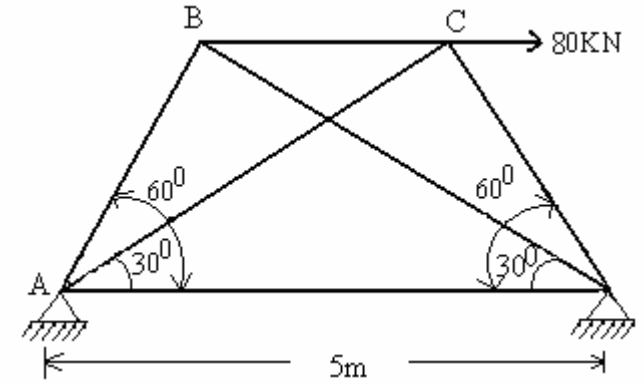

Fig.6

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Code.No: 07A40104 | R07 | SET-4

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

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

Answer any FIVE questions
All questions carry equal marks

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1. Analyze the propped cantilever bean shown in Fig.1 and draw shear force and bending moment diagrams. [16]

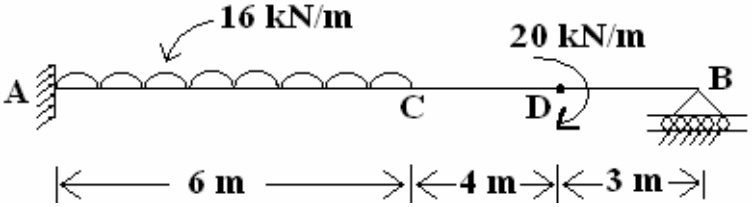

Fig.1

2. A beam fixed at its ends has a span of 12 m. It carries a uniformly distributed load of 25 kN/m extending from left support to a point 5 m from it. Calculate the fixed end moments. Draw the shear force and bending moment diagrams. Locate the distance of points of contra-flexure from fixed ends. [16]

3. Analyze the continuous beam shown in Fig.2 using theorem of three moments. Draw shear force and bending moment diagrams. Mark the location of maximum bending moment and points of contra-flexure and hence draw elastic curve. [16]

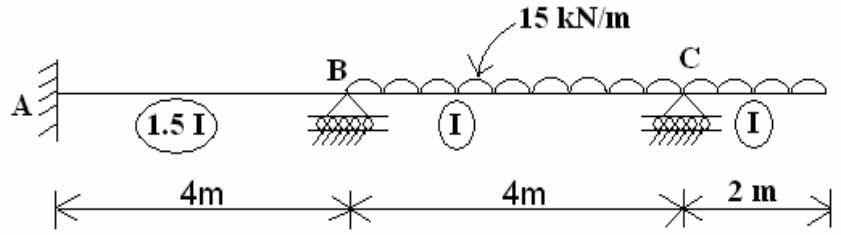

Fig.2

4. Analyze the continuous beam shown in Fig.3, using slope-deflection method. Draw bending moment diagram and hence sketch the elastic curve. [16]

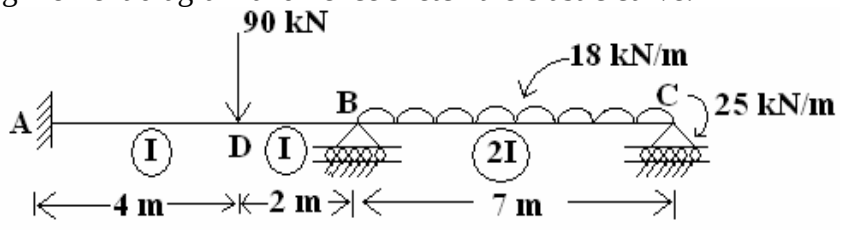

Fig.3

5. A steel beam of uniform cross-section is simply supported over a span of 16 m and carries concentrated loads of 70, 120 and 180 kN at distances of 3 m, 5 m and 9 m respectively from left support. Compute the deflection under 180 kN load using unit load method. EI = 400×10^4 kNm^2. [16]

6. The system of concentrated loads shown in Fig.4 rolls from left to right on the girder of span 20 m, 55kN load is leading the loads. For a section at 7 m left support, determine
a) Maximum bending moment and b) Maximum shear force. [16]

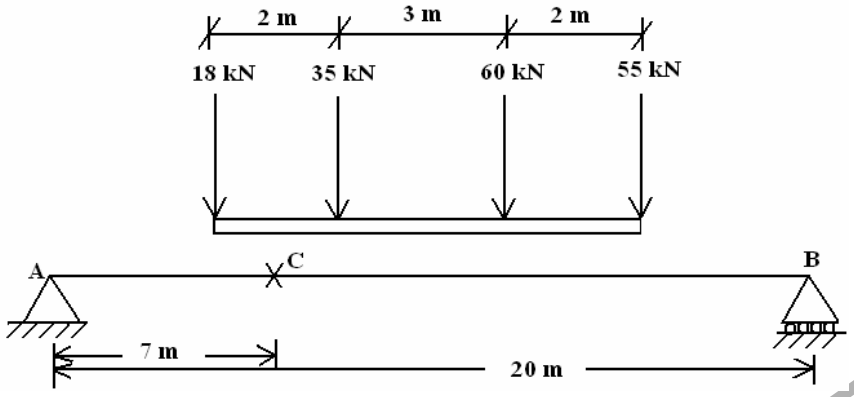

Fig.4

7. Draw the influence line diagram for forces in the members U_2L_3, U_3L_4, U_3U_4 and U_3L_3 of the frame shown in Fig.5 and find the maximum forces develoed when uniformly distributed load of intensity 65 kN/m, longer than span moves from left to right on the bottom chord. [16]

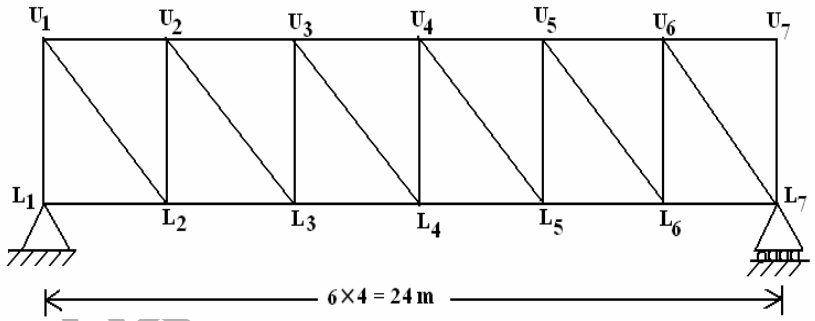

Fig.5

8. Determine the forces in all the members of the truss shown in Fig.6. Take cross sectional areas for AD, BE and BC as 3500 mm^2 and for all other members as 2700 mm^2. Assume modulus of elasticity = 206 GPa. [16]

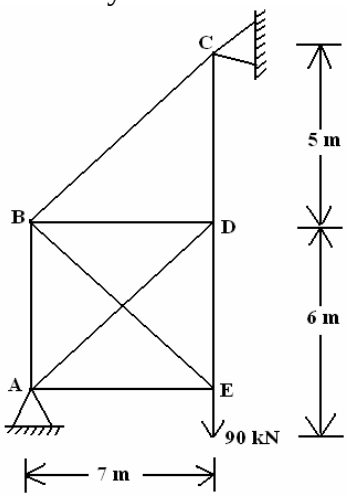

Fig.6

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