Code No: R31015 **R10** **Set No: 1**

III B.Tech. I Semester Regular Examinations, November/December - 2012
STRUCTURAL ANALYSIS-II
(Civil Engineering)

Time: 3 Hours **Max Marks: 75**

Answer any FIVE Questions
All Questions carry equal marks
*****

1. A three hinged parabolic arch has span 25 m and a central rise of 5 m. The arch is hinged at the crown and springing. It carries a point load of 150 kN at 8 m from the left support. Calculate the horizontal thrust, the reactions at the support and the maximum bending moment.

2. A two hinged circular arch of span 25 m and central rise 5 m. The arch is hinged at the ends. It carries uniformly distributed load of 25 kN/horizontal metre run over the 10 m from the right support toward the centre. Calculate the horizontal thrust, the reactions at the supports and the maximum bending moment. Assume that the moment of inertia at any section is $I_0 \sec\theta$ where θ is the inclination of the arch with horizontal and I_0 is the moment of inertia of the section at the crown.

3. Analyse the frame shown in Fig.1, using Portal Method,

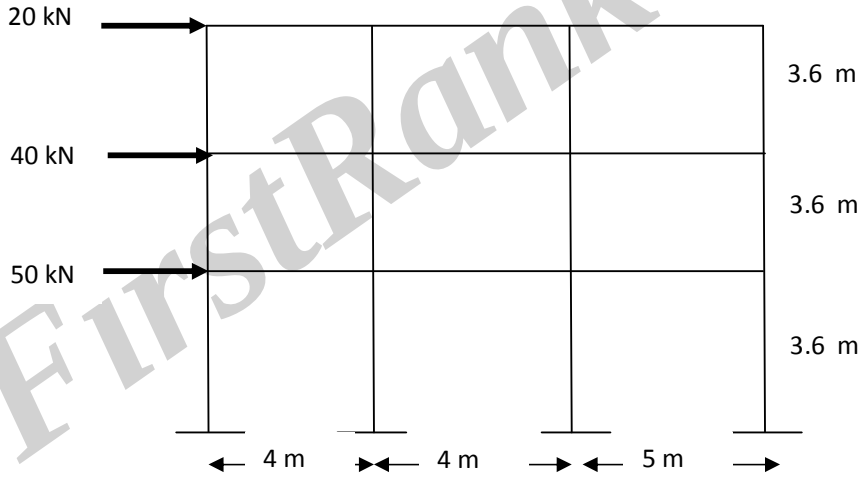

Fig.1

4. Determine the span of a steel parabolic cable suspended between two supports at the same level. The limiting value of the central dip is $1/12^{th}$ of the span and the permissible stress in the cable is 125 N/mm^2.

Code No: R31015 **R10** **Set No: 1**

5. Analyse the beam shown in the Fig.2 , if the support **B** sinks by 10 mm. Use moment distribution method. Adopt I = 125 × 10^6 mm^4 and E = 2 × 10^5 N/mm^2.

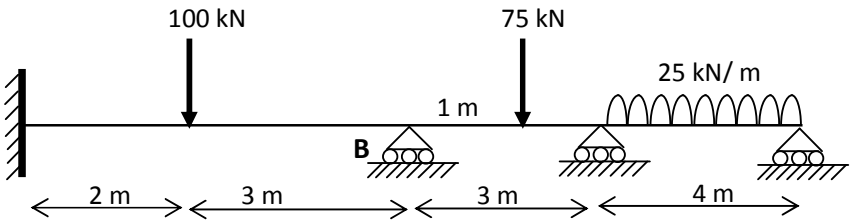

Fig.2

6. Analyse the beam shown in Fig.3, using Kani's method.

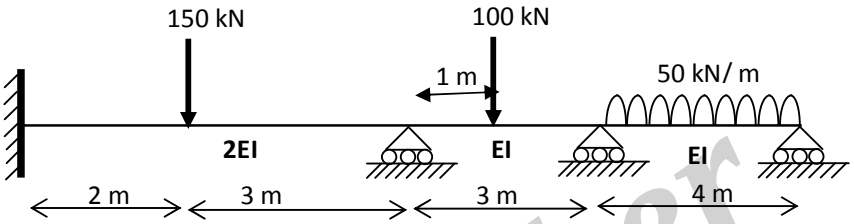

Fig.3

7. Analyse the beam shown in the Fig.4, using flexibility method.

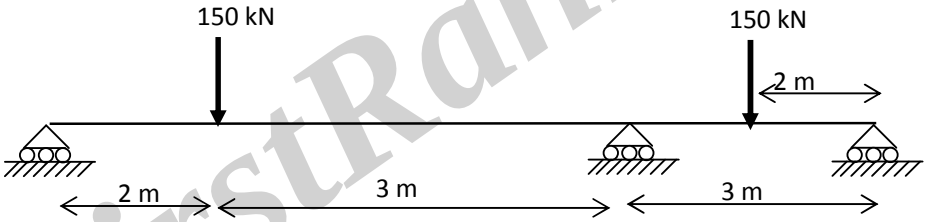

Fig.4

8. Analyse the beam shown in the Fig.5, using stiffness method.

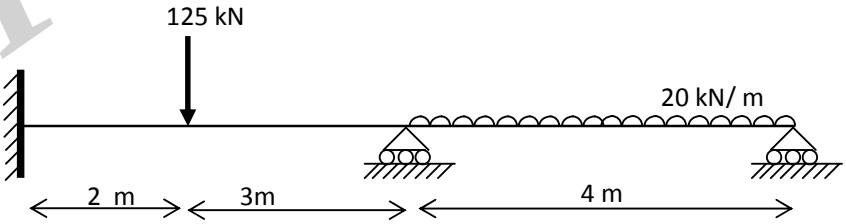

Fig.5

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Code No: R31015 **R10** **Set No: 2**

III B.Tech. I Semester Regular Examinations, November/December - 2012
STRUCTURAL ANALYSIS-II
(Civil Engineering)

Time: 3 Hours **Max Marks: 75**

Answer any FIVE Questions
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*****

1. A three hinged circular arch has span 25 m and a central rise of 5 m. The arch is hinged at the crown and springings. It carries a point load of 150 kN at 8 m from the left support. Calculate the horizontal thrust, the reactions at the support and the maximum bending moment.

2. A two hinged parabolic arch of span 24 m and central rise of 5 m. The arch is hinged at the ends. It carries uniformly distributed load of 20 kN/horizontal metre run over the 8 m from the right support toward the centre. Calculate the horizontal thrust, the reactions at the supports and the maximum bending moment. Assume that the moment of inertia at any section is $I_0 \sec\theta$ where θ is the inclination of the arch with horizontal and I_0 is the moment of inertia of the section at the crown.

3. Analyse the frame shown in Fig.1, using Cantilever Method. Given within the paranthesis are the areas of the columns in that position.

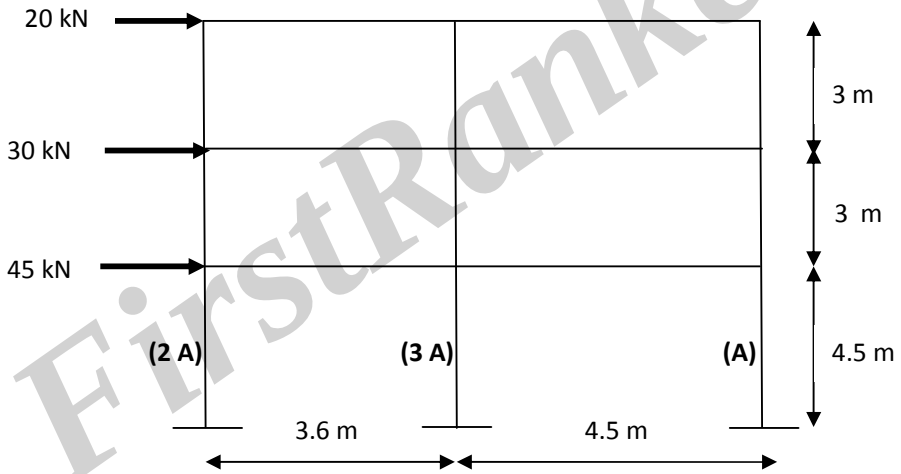

Fig.1

4. The horizontal span of a cable is 100 m. The left support is at higher level than the right support by 10 m. The dip of the lowest point of the cable is 4 m below the right support and the cable is subjected to a load of 6 kN/ horizontal metre. Find the maximum pull in the cable and also find the length of the cable.

Code No: R31015 **R10** **Set No: 2**

5. Analyse the frame shown in the Fig.2, by moment distribution method.

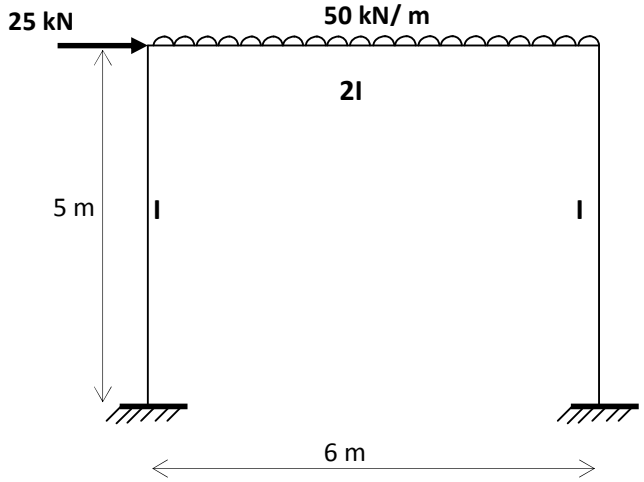

Fig.2

6. Analyse the beam shown in Fig.3, using Kani's method.

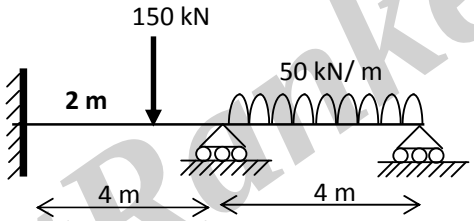

Fig.3

7. Analyse the beam shown in the Fig.4, using flexibility method.

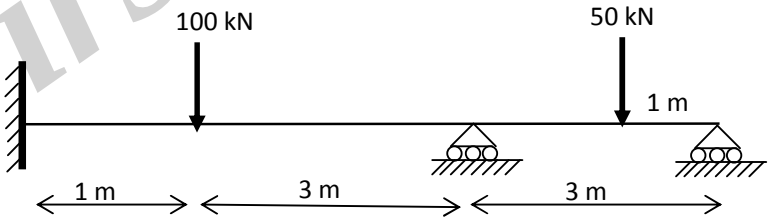

Fig.4

8. Using stiffness method, analyse the beam shown in Fig.5

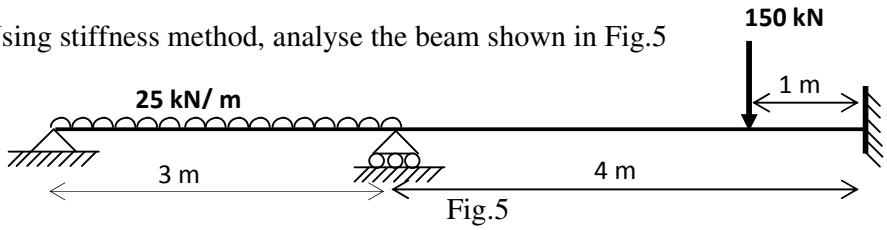

Fig.5

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Code No: R31015 **R10** **Set No: 3**

III B.Tech. I Semester Regular Examinations, November/December - 2012
STRUCTURAL ANALYSIS-II
(Civil Engineering)

Time: 3 Hours **Max Marks: 75**

Answer any FIVE Questions
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*****

1. A three hinged parabolic arch of span 30 m and rise 6m carries uniformly distributed load of 50 kN/horizontal metre run over the right half of the span. Calculate the support reactions and also find bending moment, radial shear and normal thrust at a section 10 m from the right support.

2. A two hinged parabolic arch hinged at the supports has 50 m span and rise 10 m is subjected to 25 kN at 20 m from the right hinge. Find the reactions at the supports. Assume that the moment of inertia at any section is $I_0 \sec\theta$ where θ is the inclination of the arch axis with horizontal and I_0 is the moment of inertia of the section at the crown.

3. Analyse the frame shown in Fig.1,using portal frame method. Lateral loads are 40 kN, 60 kN and 80 kN acting from top. Each bay is 3.6 m and height of each storey is 4 m.

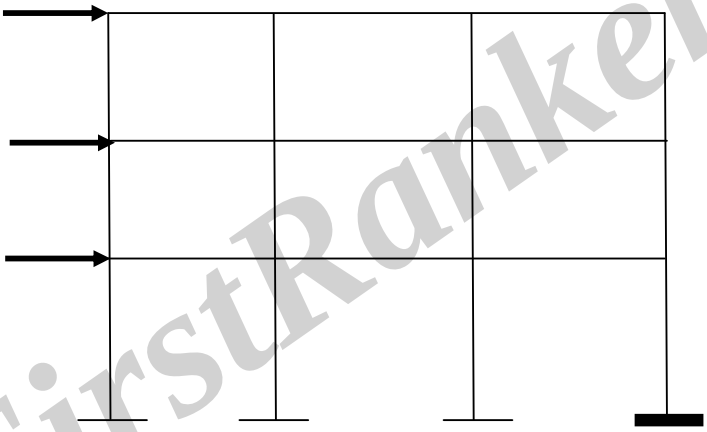

Fig.1

4. A suspension cable of 60 m span and 5 m dip is stiffened by a three hinged stiffening girder. It is subjected to a concentrated load of 150 KN at 10 m from the left end in addition to a dead load of 10 kN/m. Find the maximum tension in the cable and the shear force and the bending moment in the girder at 15 m from the left end.

5. Analse the beam shown in the Fig.2, by moment distribution method. Draw the shear force and bending moment diagrams.

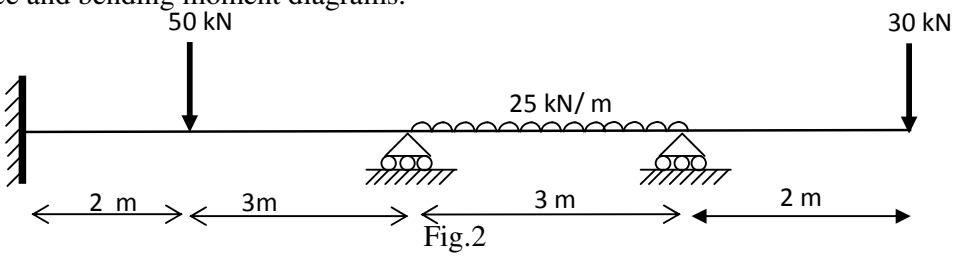

Fig.2

Code No: R31015 **R10** **Set No: 3**

6. Analyse the frame shown in the Fig.3, by Kani's method.

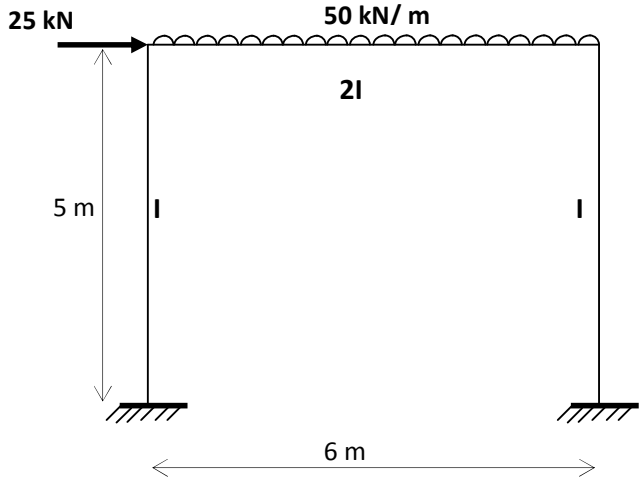

Fig.3

7. Analyse the beam shown in the Fig.4, using flexibility method.

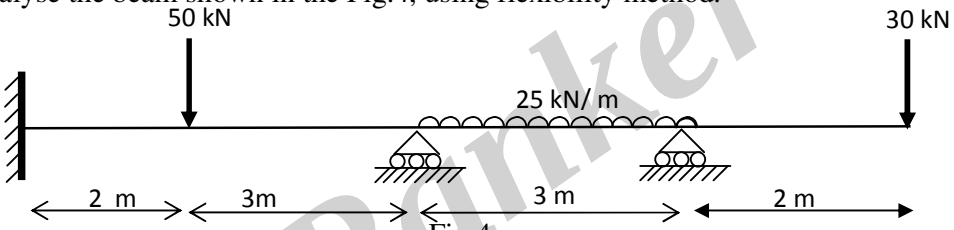

Fig.4

8. Analyse the continuous beam shown in Fig.5, using stiffness method.

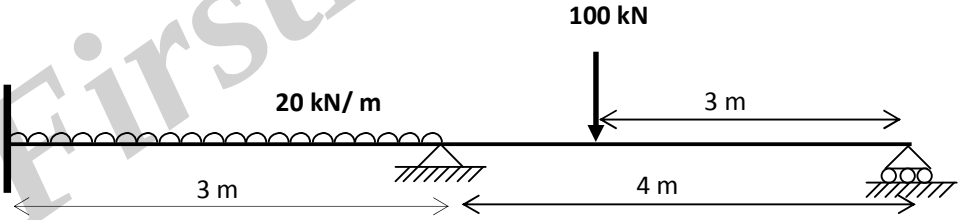

Fig.5

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Code No: R31015 **R10** **Set No: 4**

III B.Tech. I Semester Regular Examinations, November/December - 2012
STRUCTURAL ANALYSIS-II
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Time: 3 Hours **Max Marks: 75**

Answer any FIVE Questions
All Questions carry equal marks
*****

1. A three hinged circular arch of span 20 m and rise 5 m carries uniformly distributed load of 25 kN/horizontal metre run over the left half of the span. Calculate the support reactions and also find bending moment, radial shear and normal thrust at a section 10 m from the right support.

2. A two hinged parabolic arch of span 25 m and rise 6 m carries uniformly distributed load of 25 kN/horizontal metre run over the left half of the span. Calculate the support reactions and also find bending moment at a section 10 m from the left support. Assume that the moment of inertia at any section is $I_0 \sec\theta$ where θ is the inclination of the arch axis with horizontal and I_0 is the moment of inertia of the section at the crown.

3. Analyse the frame shown in Fig.1, using Portal Method.

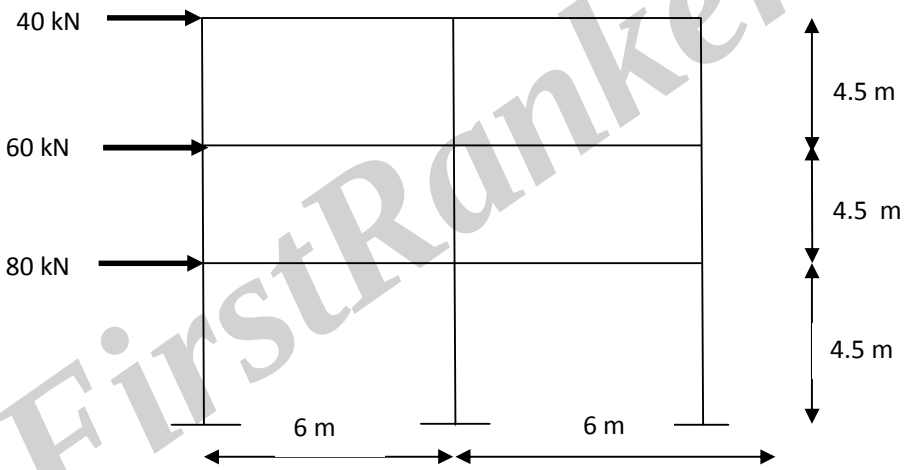

Fig.1

4. A suspension bridge has125 m span and supported by two cables with central dip of 10 m dip. The bridge carries total uniformly distributed load of 750 kN. The cables are attached to the saddles resting on rollers on the top of the piers and the anchor cables make an angle of 45^0 with vertical. Determine the tension in the anchor cables and the vertical pressure on the piers.

Code No: R31015 **R10** **Set No: 4**

5. Analyse the beam shown in the Fig.2, by moment distribution method. Draw the shear force and bending moment diagrams.

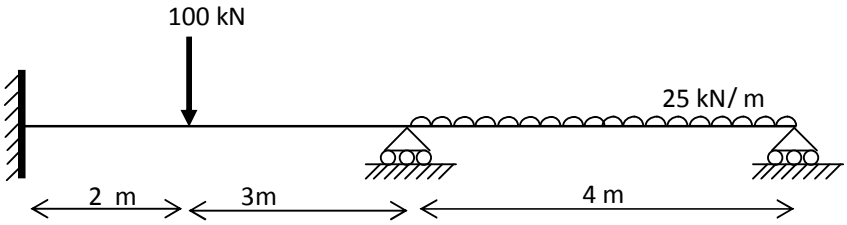

Fig.2

6. Analyse the frame shown in the Fig.3, by Kani's method.

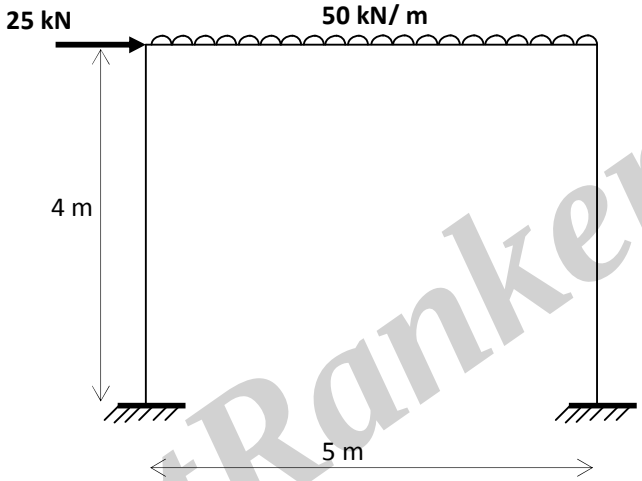

Fig.3

7. Analyse the continuous beam shown in Fig.4, using flexibility method.

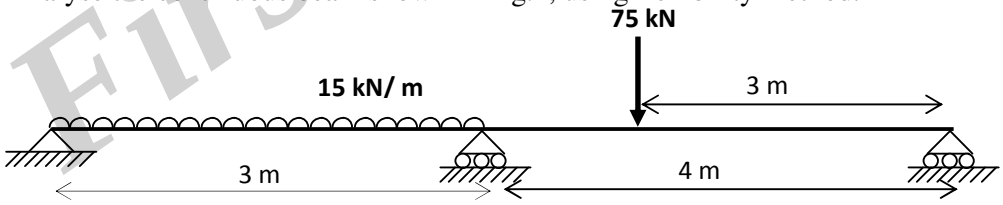

Fig.4

8. Analyse the continuous beam shown in Fig.5, using stiffness method.

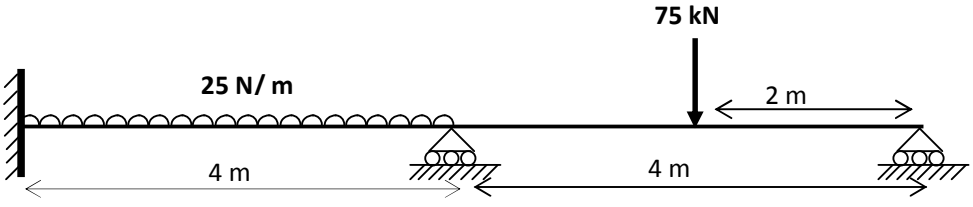

Fig.5

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