Code No: RR-320102

III B.Tech II Semester – Regular-Examinations April/May-2005
STRUCTURAL ANALYSIS - II
(Civil Engineering)

Set No 1

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

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

1. A three hinged semi-circular arch of radius R carries a u.d.l. of intensity "w" per unit length over its entire horizontal span. Find the support reactions and max B.M. Sketch the B.M.D. Obtain expressions for radial shear and normal thrust at a distance "x" from the left support hinge.

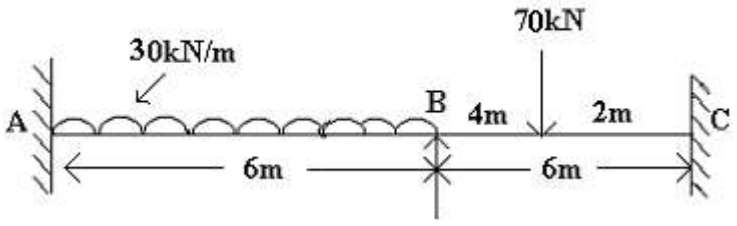
2. A two-hinged semi-circular arch of radius R, carries a point load W at the crown. Obtain the expression for the horizontal thrust, if EI = constant. Find the B.M. at crown and sketch the B.M.D.

3. A light string having supports at the same level, 40m apart, carries loads of 20N, 30N, and 12N at a spacing of 10m c/c. If the total length of the string = 44m, find the shape of the string and tensions in various portions. Sketch the shape.

4. Analyse a two-span continuous beam ABC having the end supports A and C fixed and spans AB = 4m and BC = 6m. On AB there is a u.d.l. of 10 kN/m while on BC there is a point load of 30kN at 2m from ⊂. The moment of inertia of BC is twice that of AB. Sketch the B.M. and S.F.D.

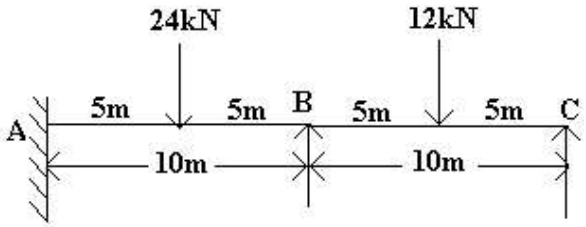
5.a) Derive the slope deflection equations.
b) Explain the analysis of continuous beam by the slope-deflection method.

6. Analyse the two-span continuous beam, having fixed end supports, loaded as shown in Figure below, by moment distribution method. Sketch the B.M. and S.F. diagrams.

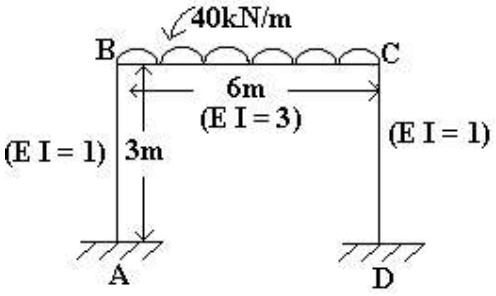


Contd..

7. Using Flexibility method analyse the continuous beam shown in the figure. Obtain the released structure by removing the supports B and C so that it becomes a cantilever. choose the coordinates 1 and 2 vertically upwards at B and C and proved. Sketch the BMD.



8. Analyse the fixed base portal loaded as shown in figure below using stiffness method and sketch the BMD.



&&&

Code No: RR-320102

Set No 2

III B.Tech II Semester – Regular-Examinations April/May-2005
STRUCTURAL ANALYSIS - II
(Civil Engineering)

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

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

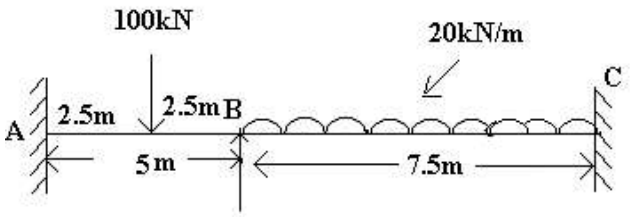
1. A segmental arch of horizontal span 25m and central rise 5m is hinged at the springings and crown. It carries a point load of 100 kN at a distance of 6m from the left support hinge. Calculate the reactions at the supports and crown. Find the B.M., radial shear and normal thrust at 5m from the left support.

2. A two – hinged semi-circular arch of radius R, carries a u.d.l of intensity "w" per unit length of entire horizontal span. Obtain the expression for the horizontal thrust, if EI = constant. Find also the B.M. at crown and sketch the B.M.D.

3. A cable is used to support 5 equal loads of 80kN each at equal spacing of 10m c/c, the supports being at the same level. Find the length of the cable required and its section, if the permissible tensile stress in the cable is 140 N/mm^2 and central dip = 6m.

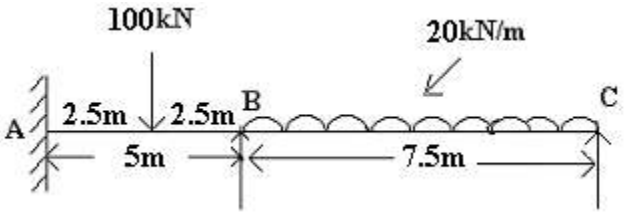
4. A two span continuous beam ABC has spans AB = 3m and BC = 4m and the end A and C are simply supported. On AB there is a load of 36 kN at 2m from A, while on BC there is a u.d.l. of 18 kN/m. If the moment of inertia of BC is 1.5times that of AB, analyse the beam using Kani's method. Sketch the B.M. and S.F.D.

5. Using slope deflection method, analyse the two span continuous beam loaded as shown in the Figure below. Sketch the B.M. and S.F. Diagram.

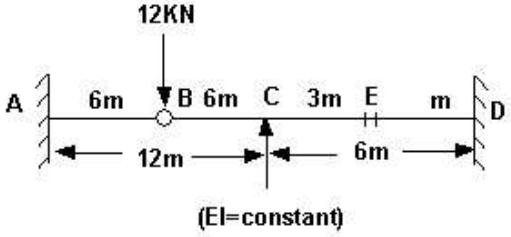


Contd..2

6. Using moment distribution method analyse the two-span continuous beam loaded as shown in Figure below. The end A is fixed while the end C is simply supported. Sketch the B.M. and S.F. diagram.



7. Analyse the two-span continuous beam loaded as shown in Figure below, if the beam has an internal hinge at B. Use Flexibility method by making a cut at E. Obtain the support moments and reactions. Sketch the B.M.D



8. A two-span continuous beam ABC is fixed at A and C. Span AB = BC= L. Using displacement method, obtain the moment at support B. If the support C settles by $\Delta = L/100$. (E I =constant)

&&&

Code No: RR-320102

Set No 3

III B.Tech II Semester – Regular-Examinations April/May-2005
STRUCTURAL ANALYSIS - II
(Civil Engineering)

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

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

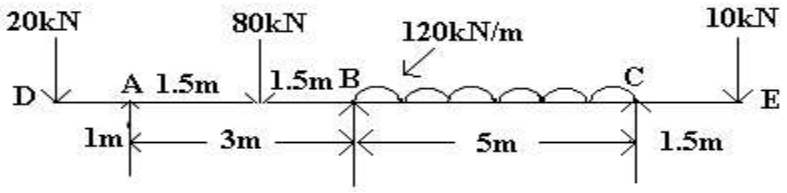
1. A three hinged segmental arch of horizontal span 50m and central rise 6m is hinged at crown and springings. It has a vertical load of 100kN at 15m from the right support. Find the support reactions and B.M., normal thrust and radical shear at 15m from left support.

2. A two – hinged semi – circular arch of radius R, carries a u.d.l of intensity "w" per unit length over the left half of span. Obtain the horizontal thrust, if EI = constant.

3. A cable is supported at two points A and B, such that the horizontal distance AB=20m and A is 1m above B in elevation. 4 loads of 2 k N, 4 k N, 5 kN and 3 kN are suspended at equal horizontal spacing of 4m c/c. If the dip of the cable at the application of 2 kN load is 1m below A, find the max. tension in the cable and its length.

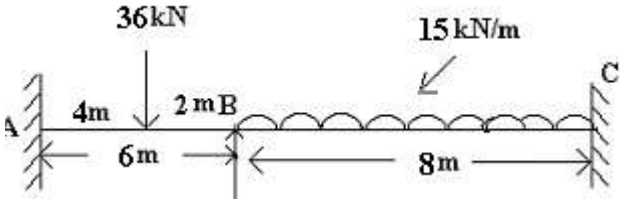
4. Using Kani's method analyse a two span continuous beam ABC having the spans AB = 4m and BC = 5m. The end A is fixed while the end C is simply supported. On AB there is a u.d.l. of 20 kN/m while BC carries a load of 100kN at 2m from C. The moment of inertia of BC is twice that of AB. Sketch the B.M. and SFD.

5. Analyse the two-span continuous beam having overhangs on both sides as shown in figure below by the slope deflection method and sketch the B.M. and S.F.D.



Contd..2

6. Analyse the two span continuous beam ABC loaded as shown in Figure below. The ends A and C are simply supported. Use moment distribution method. Sketch the B.M. and S.F. diagram.



7. A two span continuous beam ABC, having equal spans AB =BC = L is fixed at A and supported at B and C. Using Flexibility method analyse the beam, if the support at A permits an anti-clockwise rotation at B settles radian and the support at B settles downwards by $\Delta = L/100$. Find the upward reaction at support C.

8. A two-span continuous beam ABC, having equal spans AB = BC= L, is fixed at A and support at B and C. If the support A permits an anti-chock wise rotation, θ = 0.004 radian and the support B settles by $\Delta = L/100$. Using stiffness method find the reaction at C.

&&&

Code No: RR-320102

Set No 4

III B.Tech II Semester – Regular-Examinations April/May-2005
STRUCTURAL ANALYSIS - II
(Civil Engineering)

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

Answer any FIVE questions
All questions carry equal marks

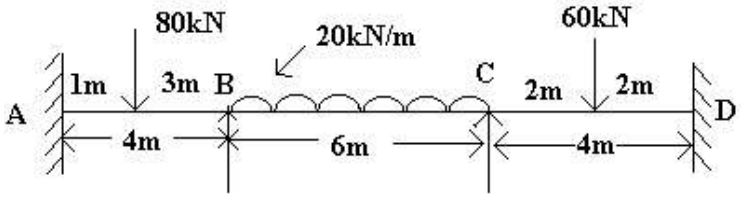
---

1. A parabolic arch rib of horizontal span 24m and central rise 8m is hinged at the springings and crown. It carries a point load of 30kN at 8m from the left support hinge. Calculate the
   a) reaction at the hinges
   b) max. positive and negative B.Ms.
   c) normal thrust and radial shear at 6m from the left support. Sketch the B.m.D.

2. Determine the horizontal thrust in a semi-circular arch of radius R, hinged at springings, if it carries a triangular load the intensity of which varies from zero at left end to "w" per unit length at the right and (E I = constant). Find also the B.M. at crown.

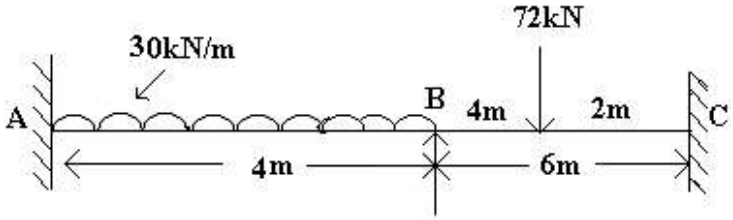
3. A cable loaded with a u.d.l of 20 kN/m is stretched between two supports in the same horizontal line, 200m apart. If the central dip is 20m find the max. and minimum pulls in the cable. If the permissible tensile stress is 1000 N/mm^2, find the safe dia of cable.

4. Using Kani's method determine the support moments for the three-span continuous beam with fixed end supports shown in figure below (EI = constant). Sketch the B.M. and S.F. D.

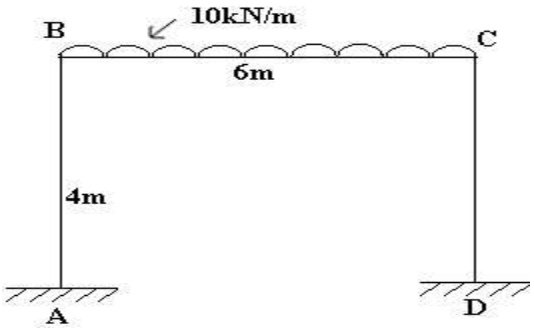


Contd..2

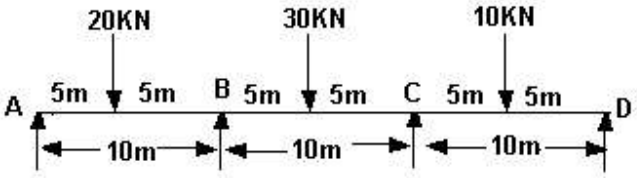
5. Analyse the two-span continuous beam loaded as shown in figure below by the slope-deflection method and sketch the B.M. and S.F. diagrams.



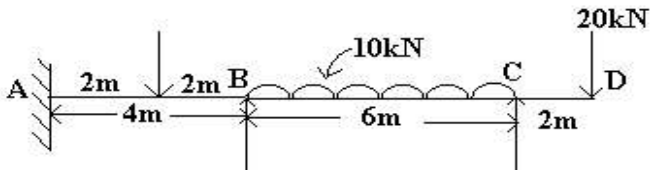
6. Using the moment distribution method analyse the fixed base portal loaded as shown in figure below and sketch the B.M.D. (E I = constant).



7. Using the Flexibility method obtain the support moments and reaction for the continuous beam, shown in figure below, if the downward settlements of supports B and C are 150/EI and 75/EI respectively (on kN-m units). Sketch the BMs.



8. Using stiffness method analyse the continuous beam loaded as shown in figure below. Sketch the B.M.D.



&&&