Code: 9A01709

R09

B.Tech IV Year I Semester (R09) Supplementary Examinations June 2017

ADVANCED STRUCTURAL ANALYSIS

(Civil Engineering)

Time: 3 hours Max. Marks: 70

Answer any FIVE questions

All questions carry equal marks

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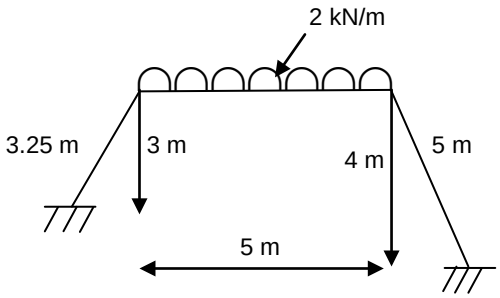
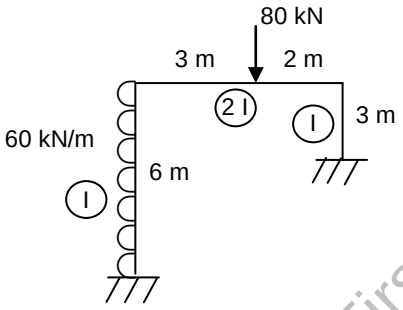
1 Analyze the frame shown in figure below using moment distribution method. Assume EI constant throughout.

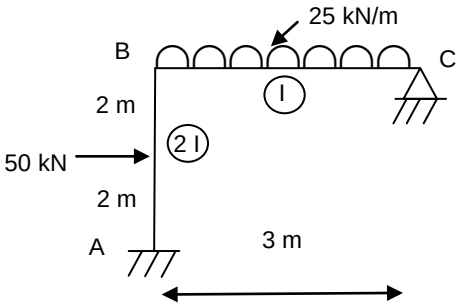


2 Analyze the portal frame shown in figure below by strain energy method.



3 A three hinged parabolic arch has span of 30 m and central rise of 6 m. Three wheel loads 50 kN, 100 kN, 200 kN spaced at 4m and 3m respectively, cross the arch from right to left with 50 kN load leading. Calculate the horizontal thrust, radial shear and normal thrust under the tail load.

4 Analyze the plane frame shown in figure below by force method. Draw BMD.



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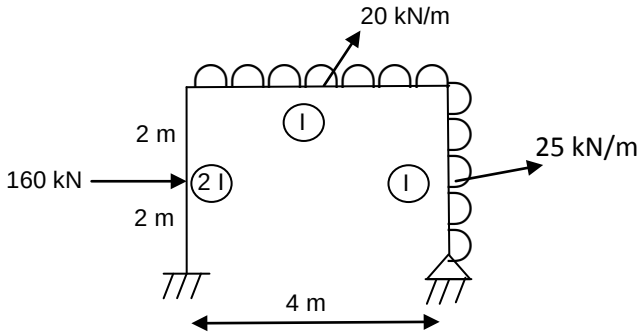
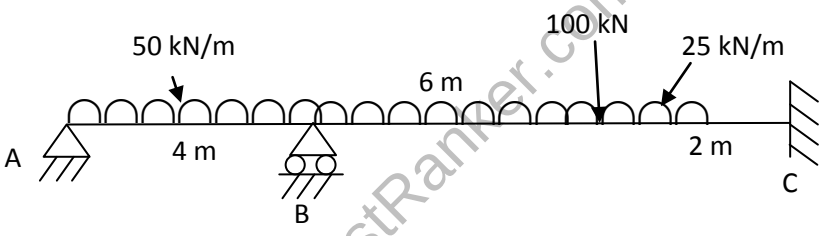
5 Analyze the frame in figure below by stiffness method. Draw bending moment diagram.

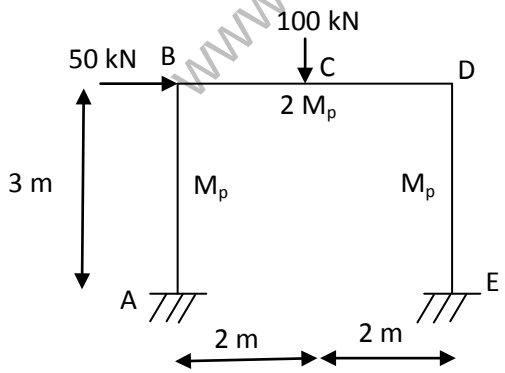


6 (a) Differentiate arch and cable.
(b) Write down the equilibrium condition of cable.
(c) A foot bridge of width 2.5 m and span 60 m is carried by two cables of uniform section with central dip of 5m. If the platform load is 5 kN/m^2, calculate the maximum permissible pull in the cable.

7 (a) State upper bound and lower bound theorem.
(b) The beam is supported and loaded as shown in figure below. Find the plastic moment. Assume constant Mp throughout.



8 The frame is loaded as shown in figure below with ultimate loads. Find the collapse load.



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