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Reg. No. : | | | | | | | | | | |

Question Paper Code: 56101

B.E./B.Tech. DEGREE EXAMINATION, NOV 2018

Sixth Semester

Civil Engineering

15UCE601- STRUCTURAL ANALYSIS – II

(Regulation 2015)

Duration: Three hours Maximum: 100 Marks

PART A - (5x 1 = 5 Marks)

Answer All Questions

1. Shape factor for a rectangular section, is CO1- R

   (a) 1.4 (b) 1.6 (c) 2 (d) 2.5

2. [P]=[k][Δ] where k is CO2- R

   (a) Flexibility (b) stiffness (c) Load (d) Displacement

3. Flexibility method in structural analysis is also known as CO3- R

   (a) Slope-deflection method (b) Moment-distribution method

   (c) Consistent-deformation method (d) Stiffness method

4. Most of the FEM software use CO4- R

   (a) displacement method (b) force method (c) stress method (d) hybrid method

5. The process of uniting all the elements together is known as ---------- CO5- R

   (a) discretization (b) assemblage (c) zonation (d) transformation

PART – B (5 x 3= 15Marks)

6. State the lower bound theorem.. CO1- R

7. Define: Kinematic Indeterminacy CO2- R

8. What is the compatibility condition used in the flexibility method? CO3- R

9. Define Shape function. CO4- R

10. Define Tension Coefficient. CO5- R

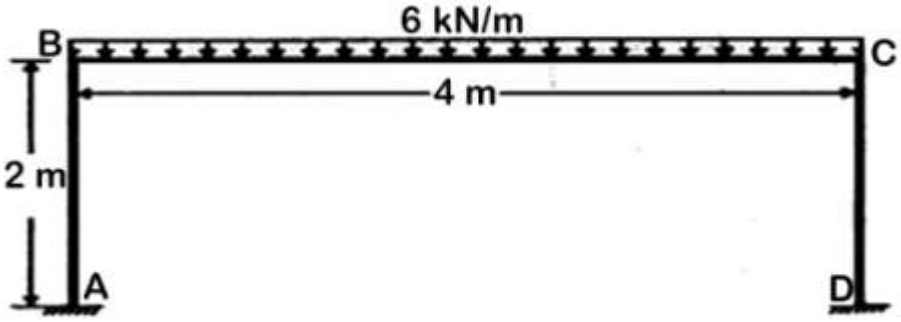
PART – C (5 x 16= 80Marks)

11. (a) Determine the shape factor and plastic moment of the symmetrical steel section (I section). Assume yield stress of steel is 250 MPa.Total depth=600 mm
Breadth of each flange= 250 mm
Depth of each flange =30 mm
Thickness of web= 12 mm
CO1-App (16)

Or

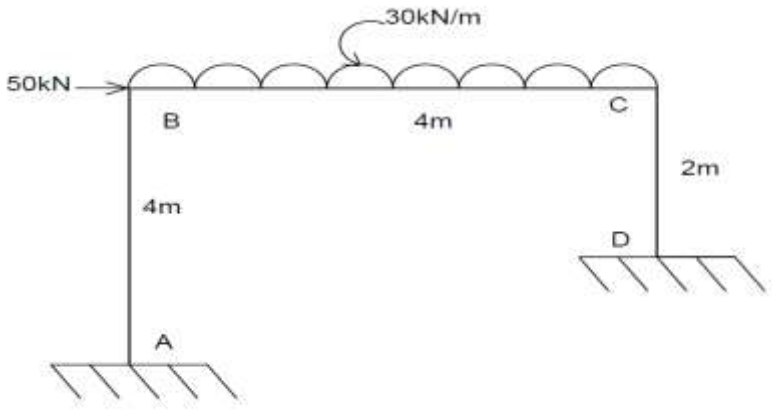
(b) A two span continuous beam ABC has span lengths AB = 6 m and BC = 6 m and carries a uniformly distributed load of 30 kN/m completely covering the spans AB and BC.A & C are simply supports. If the load factor is 1.8 and the shape factor is 1.15 for the 'I' section, find the section modulus needed. Assume yield stress for the material as 250N/mm^2 CO1- App (16)

12. (a) Analyse the portal frame shown in fig. by stiffness method and draw the BMD. CO2- Ana (16)

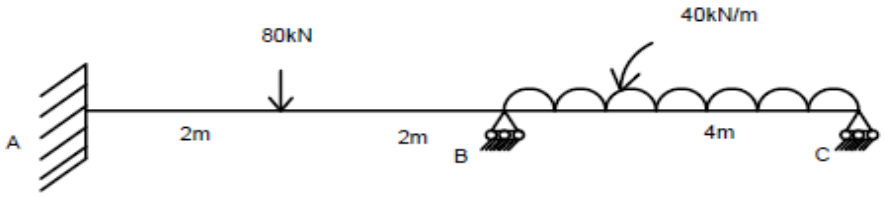


Or

(b) Analyse the Portal Frame as shown in Fig.2 by matrix stiffness method. CO2- Ana (16)

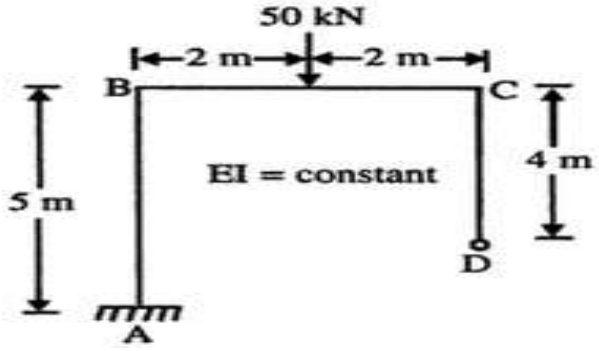


13. (a) Analyse the continuous beam as shown in Fig.3 by flexibility method and draw BMD. CO3-Ana (16)



Or

(b) Analyse the frame using matrix flexibility method. CO3- Ana (16)

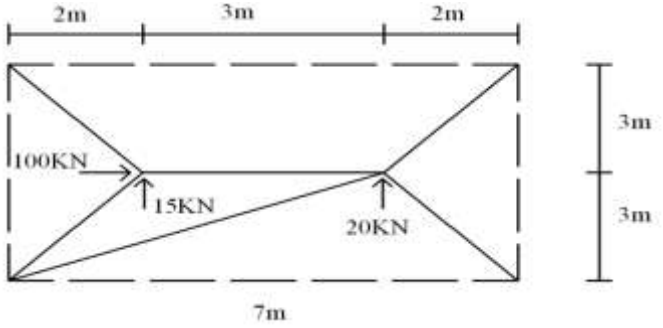


14. (a) Explain the principle of finite element method in detail. CO4- Ana (16)

Or

(b) What are all the Basic steps involved in Finite Element Method? Explain. CO4- Ana (16)

15. (a) A space frame shown in figure is supported at A,B,C and D in a horizontal plane, through ball joints. The member EF is horizontal, and is at a height of 3 m above the base. The loads at the joints E and F shown in figure act in a horizontal plane. Find the forces in all the member of the frame. CO5-Ana (16)



Or

(b) A suspension bridge is of 160 m span. The cable of the bridge has a dip of 12 m. The cable is stiffened by a three hinged girder with hinges at either end and at centre. The dead load of the girder is 15kN/m. Find the greatest positive and negative bending moments in the girder when a single concentrated load of 340 kN passes through it. Also find the maximum tension in the cable. CO5-Ana (16)