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Question Paper Code: 35104

B.E. / B.Tech. DEGREE EXAMINATION, DEC 2020

Fifth Semester

Civil Engineering

01UCE504 – STRUCTURAL ANALYSIS - I

(Regulation 2013)

Duration: One hour

Maximum: 30 Marks

PART A - (6 x 1 = 6 Marks)

(Answer any six of the following questions)

- In a frame, the number of members is sufficient to keep it in equilibrium, and then the frame is said to be
 - Imperfect frame
 - deficient frame
 - Perfect frame
 - redundant frame
- In a truss the member forces are caused by real loads are called as
 - virtual force
 - nominal force
 - imaginary force
 - real force
- Slope at a point in a beam is the
 - vertical displacement
 - angular displacement
 - horizontal displacement
 - none of these
- The bending moment value at simply supported end is
 - Max
 - zero
 - not equal to zero
 - one
- In general slope at Fixed end support is
 - Max
 - zero
 - not equal to zero
 - one
- The proportions of the unbalanced moments carried by each of the members is called as
 - Distribution factor
 - Stiffness factor
 - Flexibility factor
 - Slope deflection factor

7. Select the correct statement

- (a) Flexibility matrix is a square symmetrical matrix
- (b) Stiffness matrix is a square symmetrical matrix
- (c) Both (a) and (b)
- (d) None of these

8. The method of column analogy in structural analysis falls in the category of

- (a) displacement method
- (b) stiffness method
- (c) flexibility method
- (d) finite element method

9. Stiffness method in structural analysis is also known as

- (a) consistent-deformation method
- (b) unit load method
- (c) force method
- (d) displacement method

10. Static indeterminacy for fixed beam is

- (a) 0
- (b) 3
- (c) 4
- (d) 2

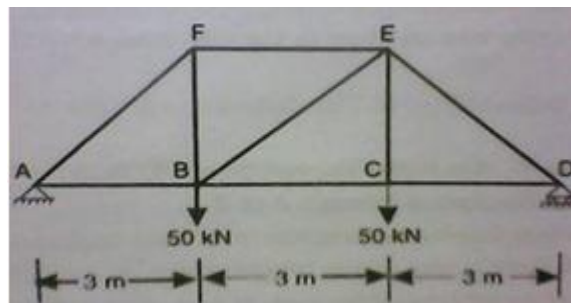
PART – B (3 x 8= 24 Marks)

(Answer any three of the following questions)

11. Determine the vertical displacement of joint C of the steel truss shown in figure.

The cross sectional area of each member is $A = 400 \text{ mm}^2$ and $E = 2 \times 10^5 \text{ N/mm}^2$.

(8)

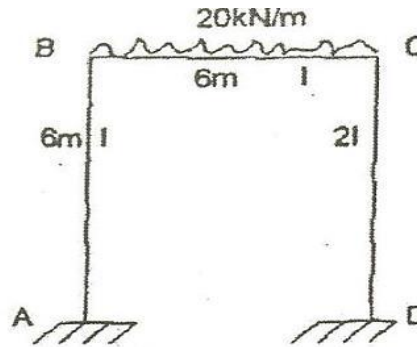


12. Analyse the given continuous beam shown in figure and draw its BMD and SFD using slope deflection method. $EI = \text{Constant}$.

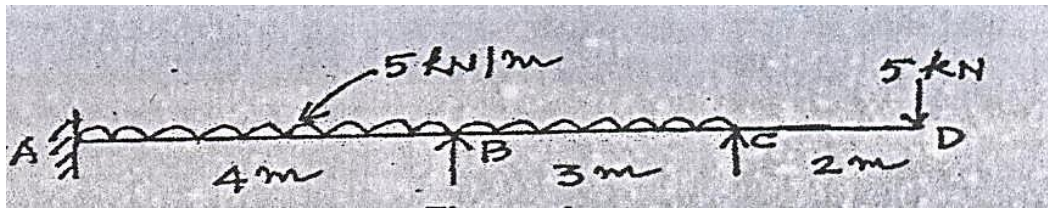
(8)



13. Analyze the frame shown in figure By moment distribution method and draw the SFD and BMD. (8)



14. Apply the continuous beam ABCD shown in figure by Flexibility matrix method. Take $EI = \text{Constant}$. Also sketch the shear force and Bending Moment diagram. (8)



15. A continuous beam ABC consist of span $AB = 3\text{m}$ and $BC = 4\text{m}$, the ends A and C being fixed. AB and BC carries uniformly distributed loads of intensity 4kN/m and 5kN/m respectively. Find the support moments by stiffness matrix method and draw the bending moment diagram for the beam. The beam is of uniform section throughout. (8)