Reg. No. :

Question Paper Code: 41154

B.E. / B.Tech. DEGREE EXAMINATION, MAY 2017

Fifth Semester

Civil Engineering

14UCE504 – STRUCTURAL ANALYSIS - I

(Regulation 2014)

Duration: Three hours   Maximum: 100 Marks

Answer ALL Questions

PART A - (10 x 1 = 10 Marks)

1. Number of unknown internal forces in each member of a rigid jointed plane frame is

    (a) 1   (b) 2   (c) 3   (d) 6

2. The pin jointed frame is called unstable if (m+r) is 2j, Where m – number of members, r–reaction components and j – number of joints.

    (a) (m+r) > 2j   (b) (m+r) = 2j   (c) (m+r) < 2j   (d) None of these

3. In the slope deflection equations, the deformations are considered to be caused by

    (a) Bending moment   (b) Shear force
    (c) Axial force   (d) Torsional force

4. Which of the following is not the displacement method?

    (a) Equilibrium method   (b) Slope deflection method
    (c) Column analogy method   (d) Kani's method

5. Moment distribution methods

    (a) Account flexural effects   (b) Ignore the flexural effects
   (c) Account the Axial force   (d) Account shear effects

6. The proportions of the unbalanced moments carried by each of the members is called as

    (a) Distribution factor   (b) Stiffness factor

    (c) Flexibility factor   (d) 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. The deformation of a spring produced by a unit load is called as

    (a) Flexibility   (b) Stiffness

    (c) Stress   (d) Strain

10. If the stiffness method is difficulty

    (a) Increases with its kinematic indeterminacy

    (b) Decreases with its kinematic indeterminacy

    (c) Increases with its static indeterminacy

    (d) none of these

PART - B (5 x 2 = 10 Marks)

11. State the principle of virtual work.

12. Write the limitations of slope deflection methods.

13. Define carry over factor.

14. Write down the properties of flexibility matrix.

15. Give the advantages of stiffness matrix method over flexibility matrix method.

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16. (a) Determine the vertical displacement at free end of the cantilever beam as shown in figure given blow. Take $E = 2\times10^5$Mpa, $I = 825 \times 10^7$ mm^4. Use virtual work method. (16)
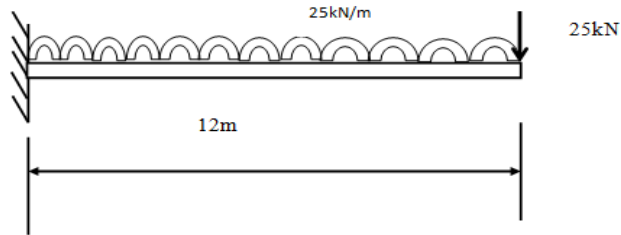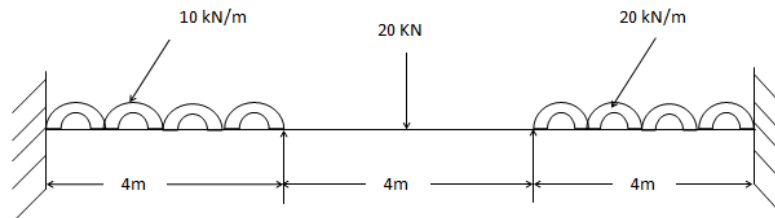

Or

(b) A beam of span "l" simply supported at ends carrying a concentrated load W at the Centre "C" as shown in figure given below. Determine the deflection at mid span by using virtual work method. (16)
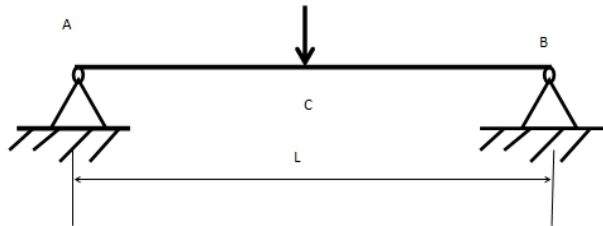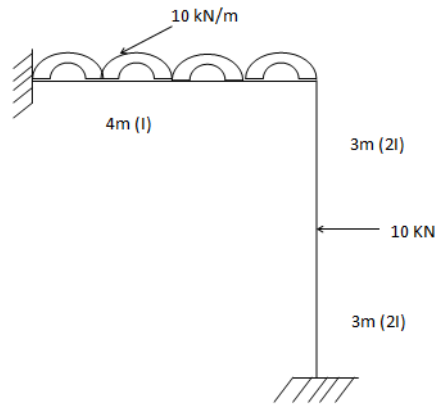

17. (a) Analysis the continuous beam as shown in figure given below by slope deflection method. Draw the shear force and bending moment diagrams. (16)
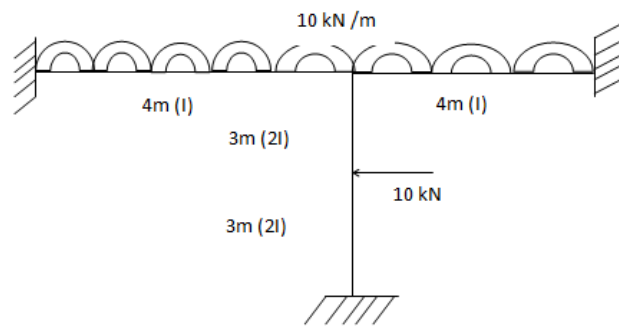

Or

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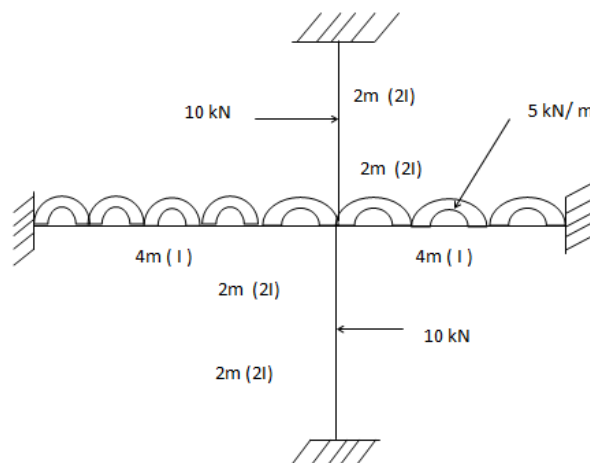(b) Analysis the structure as shown in figure given below by slope deflection methods.
(16)

18. (a) Analysis and draw the bending moment diagram as shown in figure using moment distribution method.
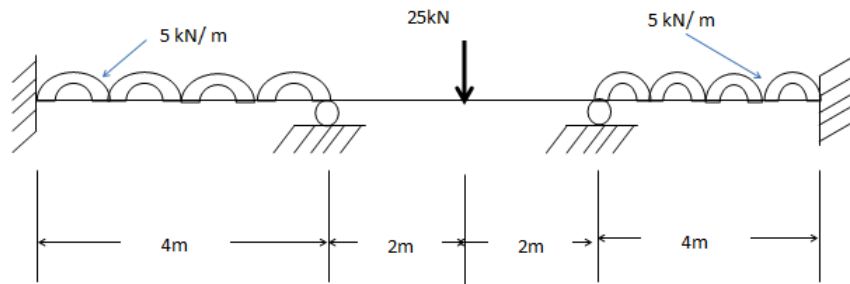(16)

Or

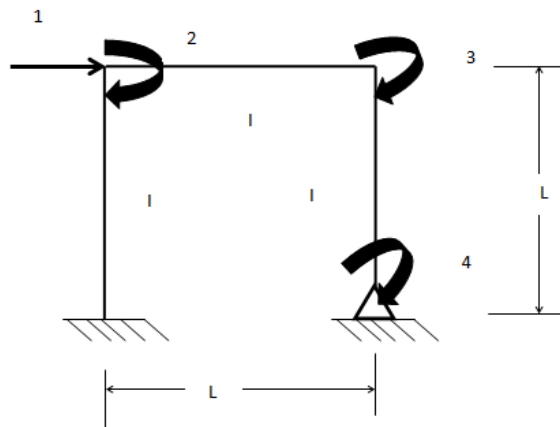(b) Analysis the frame as shown in figure given below using moment distribution method.
(16)

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19. (a) Analysis the continuous beam as shown in figure given below by flexibility method. (16)

Or

(b) Explain step by step procedure involving the flexibility matrix method. (16)

20. (a) Generate the stiffness matrix for the figure given below with co- ordinates as shown. (16)

Or

(b) Analysis the beam as shown in below by stiffness method, EI is constant. (16)

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