**Reg. No. \_\_\_\_\_\_\_\_**

**Karunya University**

**(Karunya Institute of Technology and Sciences)**

(Declared as Deemed to be University under Sec.3 of the UGC Act, 1956)

**Supplementary Examination - June 2011**

**Subject Title: STRUCTURAL ANALYSIS-II Time: 3 hours**

**Subject Code: 09CE218 Maximum Marks: 100**

#### **Answer ALL questions**

**PART – A (10 x 1 = 10 MARKS)**

1. Slope and deflection analysis is ideally suited in the analysis of \_\_\_\_\_\_\_\_\_\_ and \_\_\_\_\_\_\_\_\_\_.

2. In slope deflection method, each span of the structure is treated as \_\_\_\_\_\_\_\_\_\_.

3. Define stiffness of the beam.

4. Write down the stiffness formula for the mid support of a pair of consecutive span when the far end is fixed.

5. In flexibility method, redundants (eg. forces and moments) are treated as primary unknowns. (True / False).

6. Mention the other names of stiffness method.

7. Which unknowns are treated as primary unknowns in stiffness method?

8. In stiffness method, number of unknowns is equal to the \_\_\_\_\_\_\_\_\_\_.

9. Name the conditions of structural analysis to be satisfied by any structure.

10. Define forced vibration.

**PART – B (5 x 3 = 15 MARKS)**

11. What are the assumptions made in the slope deflection method of analysis?

12. What is meant by carry over moment and carry over factor?

13. Write short notes on degree of static and kinematic indeterminacy.

14. Derive the relationship between flexibility and stiffness method.

15. Define free vibration and enunciate the factors to be considered for the nature of vibration.

**PART – C (5 x 15 = 75 MARKS)**

16. Analyze the frame shown in figure below by slope deflection method and draw bending moment diagram.

**I**

**B**

**4m m**

**40 kN/m**

**C**

**6m m**

**2I**

**6 m**

**D**

**A**

**2I**

(OR)

[P.T.O]

17. Analyze the continuous beam ABCD shown in figure below by slope deflection method and draw bending moment diagram.

**4 m**

**D**

**4 m**

**6 m**

**30 kN/m**

**60 kN**

**60 kN**

**A**

**C**

**B**

**2 m**

**2 m**

**I**

**I**

**2I**

18. Analyze the continuous beam ABCDE shown in figure below by moment distribution method and draw the bending moment. Assume EI is uniform throughout.

**5 m**

**D**

**4 m**

**3 m**

**10 kN/m**

**40 kN**

**A**

**C**

**B**

**2 m**

**2 m**

**E**

**20 kN**

**2 m**

**10 kN**

(OR)

19. Analyse the rigid jointed frame shown in figure below by moment distribution method and draw the bending moment diagram.

**I**

**B**

**4 m**

**36 kN/m**

**D**

**6 m**

**2I**

**6 m**

**E**

**A**

**3I**

**3I**

**F**

**C**

**I**

20. Analyze the fixed beam shown in figure below by flexibility method. Analyze the beam by treating support moments as redundant and draw the bending moment diagram.

**MA**

**30 kN/m**

**C**

**3 m**

**3 m**

**EI**

**2EI**

**B**

**A**

**MC**

(OR)

[P.T.O]

21. A portal ABCD of uniform flexural rigidity is shown in figure below. Analyze by flexibility method by treating support reactions at D as redundant forces.

**B**

**4 m**

**100 kN**

**2 m**

**3 m**

**A**

**D**

**C**

22. A two span continuous beam ABC of uniform EI is shown in figure below. Analyze the beam by stiffness method.

**2 m**

**C**

**3 m**

**60 kN/m**

**A**

**B**

(OR)

23. A frame ABC is shown in figure below. EI is same for all the members. Analyze the frame by stiffness method neglecting axial deformation.

**A**

**2 m**

**40 kN**

**1.5 m**

**C**

**B**

**1.5 m**

24. Derive the equation for the undamped single degree of freedom in free vibration.

(OR)

25. Derive the equation for viscous damping and critical damping in damped free vibration with single degree of freedom.