KUMARAGURU
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B.E DEGREE EXAMINATIONS: NOV/DEC 2014
(Regulation 2009)
Sixth Semester
CIVIL ENGINEERING
CEE118: Structural Analysis II

Time: Three Hours   **Maximum Marks: 100**
Answer all the Questions:-
PART A (10 x 1 = 10 Marks)

1. Choose the Degree of static indeterminacy for a fixed beam.
    a) 3   b) 4
    c) 0   d) 2

2. Find the equation of degree of indeterminacy for truss members
    a) m-(3j-2)   b) m-(2j-4)
    c) m-(2j-3)   d) m-(j-3)

3. The extra nodes used to increase the accuracy of solution but not connected to other elements are called
    a) Nodal point   b) Internal nodes
    c) External nodes   d) Connecting nodes

4. In the formula., $\{F\} = [u]\{u\}$; u represents
    a) Vector force   b) Displacements
    c) stress   d) stiffness

5. Tension coefficient can be determined by
    a) t = T/L   b) t = T/n
    c) t = L/T   d) t = n/T

6. In two hinged stiffened girders, the girders transfers a uniform load equal to
    a) Total load X Span   b) Total load + Span
    c) Total load / Span   d) Total load - Span

7. Formula for stiffness matrix
    a) $\{\delta\} = [\alpha]\{\rho\}$ b) $\{\delta\} = [\alpha][k]\{\rho\}$
    c) $\{\delta\} = [\alpha]\{k\}$ d) $\{\delta\} = [k]\{\rho\}$

8. The flexibility matrix is also known as
    a) Stiffness method   b) Displacement method
    c) Equilibrium method   d) Compatibility method

9. In the case of pin jointed plane frames, we have to assign _____ degrees of freedom to each node.
    a) 3   b) 2
    c) 1   d) 4

10. The final force $\{p^f\}$ are given by
    a) $\{p^f\} = \{p^o\}/\{p'\}$ b) $\{p^f\} = \{p^o\}-\{p'\}$
    c) $\{p^f\} = \{p^o\}X\{p'\}$ d) $\{p^f\} = \{p^o\}+\{p'\}$

PART B (10 x 2 = 20 Marks)

11. Briefly explain the two types of DOF.
12. Term a primary structure.
13. What is meant by indeterminate structures?
14. What are the requirements to be satisfied while analyzing a structure?
15. Define stiffness coefficient kij.
16. List the properties of the stiffness matrix
17. What are the basic steps in FEM?
18. What is meant by discretization?
19. What is a catenary?
20. Briefly explain cable over saddle.

PART C (5 x 14 = 70 Marks)

21. a) (i) List the degree of indeterminacy of 2D, 3D for trusses and frames. (10)
    (ii) Briefly mention the two types of matrix methods of analysis of indeterminate structures. (4)

(OR)

b) How the principle of superposition development in a section?

22. a) Develop the flexibility matrix for the beam shown in figure 1. Take EI constant.

(OR)

b) Analyze the continuous beam shown in figure 2. Draw the BMD by the flexibility matrix method.

23. a) Analyze the frame shown in figure 3. Draw the BMD by the stiffness matrix method.

(OR)

b)   Analyze the continuous beam shown in figure 4. Draw the BMD by the stiffness matrix method.

24.   a)   (i)   Briefly explain the terminology used in FEM.   (7)

          (ii)   What are different types of elements used in FEM? Give example.   (7)

(OR)

b)   Write the step by step procedure in FEM.

25.   a)   A cable of horizontal span 21m is to be used to support six equal loads of 40kN each at 3m spacing. The central dip of the cable is limited to 2m. Find the length of the cable required and also its sectional area if the safe tensile stress is 750N/sq.mm.

(OR)

b)   Using the method of tension coefficients analyze the plane truss shown in figure 5. Find the forces in the members.

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