Register No: ……..

B.E DEGREE EXAMINATIONS: APRIL/MAY 2011

Sixth Semester

CIVIL ENGINEERING

U07CE602: Structural Analysis II

Time: Three Hours **Maximum Marks: 100**

Answer ALL the Questions:-

PART A (10 x 1 = 10 Marks)

1. The Stiffness method is also known as

a) Displacement method b) equilibrium method c) Force method d) Flexibility method

2. The equation for section energy stored in terms of axial force

a) U' = $p^2$1/2AE b) U' = p^2/2AE c) U'= $p^3$1/2AE d) U' = $p^2$1/AE

3. The degrees of freedom assigned for pin joined frames in Matrix Stiffness are

a) 3 b) 1 c) 0 d) 2

4. Matrix Stiffness method deals with forces and displacements for only

a) 2 Coordinates b) 4 Coordinates c) Assigned Coordinates d) Zero Coordinates

5. Pin jointed truss is made up of,

a) Discrete 1 – D ties b) 2 – D Elements c) 3 – D Elements

6. Which one of the following method is used to express the distributed loads as nodal loads?

a) In direct method b) Lumped load method c) Symmetric method d) Impulse method

7. The Shape factor for diamond section is

a) 1.5 b) 4 c) 1.69 d) 2

8. Which one of the following is denoted for plastic section modulus

a) Zp b) Z c) Zm d) Pz

9. In Space trusses, the relationship between the number of members and number joints is given by

a) m = 3j-5 b) m = 2j-6 c) m = 4j – 2 d) m = 3j-6

10. The maximum sag or dip of the cable varies from

a) *l*/18 b) *l*/25 c) *l*/10 d) *l*

PART B (10 x 2 = 20 Marks)

11. Write the Muller – Breslau principle.

12. What is the use of Williot mohr diagram?

13. Define flexibility coefficient.
14. Give the Examples of forces developed in curved plan.
15. What is discretisation?
16. State some advantages of finite element method.
17. Define Static theorem.
18. What is meant by plastic section modulus (Zp)?
19. Define the tension co-efficient.
20. What is the use of curved beams?

PART C (5 x 14 = 70 Marks)

21. a) (i) Prove that flexibility matrix is the inverse of stiffness matrix. (7)

(ii) Prove that flexibility matrix and stiffness matrix are symmetric. (7)

(OR)

b) Write the general procedure for solving problem by matrix flexibility method.

22. a) Analyze the portal frame with fixes base shown in figure 1 using matrix stiffness method.

(OR)

b) Analyze the continuous beam Shown in figure 2 by stiffness method. Draw the bending moment diagram.

23. a) Explain the basic procedure for adopting Finite element method FEM?

(OR)

b) State and explain the process and guidelines of discretisation with neat sketch.

24. a) (i) Define Shape factor. (2)

(ii) Determine the Shape factor value for the rectangular section of depth D and width B. (12)

(OR)

b) Determine the collapse load Wc for a continuous beam with an UDL of W/L for the entire span of length L. Shown in figure 3.

25. a) A suspension bridge of 50m span and 16m wide roadway is subjected to a load of 25kN/m^2 incliding the dead loads. The bridge is supported by a pair of cables having central dip of 4.2m. Find the cross sectional area of the cable necessary. If the maximum possible stress in the cable materials in not exceed 6000 N/mm^2.

(OR)

b) Using the method of tension coefficients analyze the plane truss shown in Fig.4 and find the forces in the members.

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