

Roll No.

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Total No. of Pages : 02

Total No. of Questions : 09

B.Tech (Civil) (Sem.-4)
STRUCTURAL ANALYSIS-I
Subject Code : CE-208
Paper ID : [A0609]

Time : 3 Hrs.

Max. Marks : 60

INSTRUCTIONS TO CANDIDATES :

1. SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.
2. SECTION-B contains FIVE questions carrying FIVE marks each and students have to attempt any FOUR questions.
3. SECTION-C contains THREE questions carrying TEN marks each and students have to attempt any TWO questions.

SECTION-A**1. Write briefly :**

- a. What is determinate structure? How do we check the determinacy of the structure?
- b. What does influence line diagram represents? Explain.
- c. What is Maxwell's reciprocal theorem?
- d. When several point loads are moving on a beam what is the condition of maximum bending moment?
- e. Differentiate between two hinged and three hinged arch.
- f. What will be the effect of change of temperature in suspension cable?
- g. What do you mean by the Macaulay's method?
- h. What is the limit of eccentricity for no tension criteria in a section?
- i. Explain strain energy method.
- j. Describe in brief the unit load method of analysis.

SECTION-B

2. Explain linear arch and prove Eddy's theorem.
3. Explain the method of substitute members for analysis of trusses with suitable examples.
4. State and explain Cartiglians 2nd theorem.
5. What is the principle of superpositions? Explain briefly.
6. What do you understand by the strain energy? Explain with suitable examples.

SECTION-C

7. A cantilever beam of $40\text{mm} \times 40\text{mm}$ section, 2m span is subjected to a load of 1 kN at the free end. The load is inclined at 30° with the vertical; determine the position of the neutral axis of the maximum stress in the beam.
8. Three wheel loads 60, 40, 50 kN spaced 2m and 2m respectively roll on simply supported girder of span 20m from left to right with the 60 kN loading, find the following :
 - a) Maximum bending moment that can occur at a section 8m from the left support.
 - b) Maximum bending moment that can occur under the 40 kN load.
 - c) Absolute maximum bending moment for the girder.
9. A three hinged parabolic arch has a span of 60m and rise of 15m from left hinge. Calculate the reactions and draw bending moment diagram, also calculate radial shear and normal thrust at left quarter span.