

TCE-402

452

Even Semester Examination - 2017

B.TECH. (IV SEMESTER)

STRUCTURE ANALYSIS-I

Time: 03:00 Hours

Max Marks : 100

Note: Attempt **all** questions, each question carry **equal** marks.

Q1. Attempt any **FOUR** questions [4 x 5]

- (i) Write down about the types of support.
- (ii) Discuss the Statically indeterminate structure to second degree for general system of loading.
- (iii) Explain the method of tension coefficient with an example.
- (iv) Differentiate between compound and complex space trusses.
- (v) Write down about the method to determine Absolute maximum B.M. in a beam.
- (vi) Write down the conditions with example to find the maximum positive shear force, maximum

negative shear force and maximum bending moment for a udl shorter than span.

Q2. Attempt any FOUR questions [4 x 5]

- (i) Discuss the method of section with its limitation.
- (ii) Muller Breslau's principle and its application in structures analysis.
- (iii) A UDL load of 50 KN/m. Run of length 5m moves on a girder of span 10m. Find the maximum positive and negative shear force at a section of 5m from the left.
- (iv) State the Betti's law of reciprocal theorem and Maxwell's reciprocal theorem.
- (v) What is ILD? What are the advantages of ILD.
- (vi) Draw ILD for horizontal thrust of a three hinged arch at the center and at a section, assume variables.

Q3. Attempt any TWO questions [2 x 10]

- (i) A plane frame of two members AB and OB, hinged at A and O to the wall. If the Length of

OA and OB is 1.5m and 2m respectively. Determine the forces in the members due to vertical forces 'P' applied at joint B.

- (ii) Find the deflection at the free end of a cantilever carrying a concentrated load at the free end by using Castigliano's theorem. Assume uniform flexural rigidity.
- (iii) What are the various types of trusses? Explain with the help of neat sketches.

Q4. Attempt any TWO questions [2 x 10]

- (i) A three hinged arch of span 100m and rise 20m carries five vertical load of 30KN each equally spaced horizontally. Determine the horizontal thrust and draw the bending moment diagram if the arch is parabolic.
- (ii) What do you understand by linear arch? Explain briefly. Also write down the statement of Edy's theorem.
- (iii) A suspension bridge cable of span 80m and central dip of 8 m is suspended from the same

level at two towers. The bridge cable is stiffening girder which carries a single concentrated load of 10KN at a point of 20m from one end. Sketch the SF diagram for the girder.

Q5. Attempt any TWO questions [2 x 10]

- (i) Five wheel loads 20KN, 25KN, 15KN, 16KN and 30K, spaced at 1m interval roll on a girder of span 20m from left to right with 20KN load leading. Find absolute Maximum bending moment for the girder.
- (ii) Write down the temperature effect on two and three hinged parabolic arch.
- (iii) Derive the expression for the total length of a cable which has different support level. Assume Variables.
