6E6031

Roll No. _____ Total No of Pages: 3

6E6031/6E3032

B. Tech. VI-Sem. (Main/Back) Exam., April/May-2016

Civil Engineering

6CE1A Theory of Structures-II

Time: 3 Hours **Maximum Marks: 80**

Min. Passing Marks (Main & Back): 26

Instructions to Candidates:-

*Attempt any **five questions**, selecting **one question** from **each unit**. All Questions carry **equal** marks. Schematic diagrams must be shown wherever necessary. Any data you feel missing may suitably be assumed and stated clearly.*

Units of quantities used/ calculated must be stated clearly.

Use of following supporting material is permitted during examination. (Mentioned in form No. 205)

1. NIL 2. NIL

UNIT-I

Q.1 A beam ABC is simply supported at A, B and C and has hinge at D located at centre of BC. AB = 6 m, BC = 8 m. Draw influence line diagrams for reactions at A, B and C and for shear force at B. Calculate the maximum values of these quantities if an uniformly distributed load of 10kN/m and length 4m crosses the beam from left to right. [16]

OR

Q.1 Draw the influence line diagram for reaction at A for the continuous beam A B C. AB = BC = 5m. Flexural rigidity constant. Calculate ordinates at every / m interval. Beam is simply supported at A, B and C. [16]

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UNIT-II

Q.2 A three hinged parabolic arch of 18m span and 4m central rise carries a uniformly distributed load of 4kN/m intensity on the left 6m length. Calculate the normal thrust and radial shear at a distance of 5m from left end. Also calculate the maximum positive and negative bending moments. Both the ends of the arch are hinged at same level. Third hinge is at crown. [16]

OR

Q.2 A two hinged parabolic arch has a span of 26m and rise 5m. It is subjected to a concentrated load of 10kN at 8m from lift end hinge. The second moment of area varies as the secant of the slope of rib axis. Calculate the reactions at the hinges and the inclination of resultant reactions with the horizontal. Also calculate the maximum positive and negative bending moments anywhere on the arch. [16]

UNIT-III

Q.3 A cable 20m long, is supported at two ends at the same level. The supports are 16m apart. The cable supports three loads of 14kN, 9kN and 12kN dividing the 16m distance in four equal ports. Determine shape of cable and reaction at the ends of the cable. [16]

OR

Q.3 The three hinged stiffening girder of a suspension bridge of 200m span is subjected to a point load of 25kN placed at 50m from left end hinge. Determine the bending moment and shear force at a section 80m from left end. Also calculate the maximum tension in the cable. Cable has a central dip of 20m. [16]

UNIT-IV

Q.4 A beam of rectangular section, 120 mm wide and 160 mm deep is subjected to a bending moment of 24kN m. The trace of the plane of loading is inclined at 45° to the y – y axis of the section. Locate the neutral axis of the section and determine the maximum bending stress induced in the section. [16]

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OR

Q.4 If the principal stresses at a point in an elastic material are 3f tensile , 2f compressive and f compressive, calculate the value of f at failure, according to five different theories of failure. The yield stress in simple tension is 250 N /mm^2 and passion's ratio = 0.3. [16]

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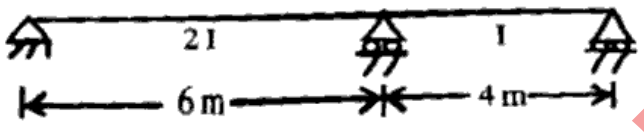
UNIT-V

Q.5 (a) Differentiate between stiffness method and flexibility method. [8]

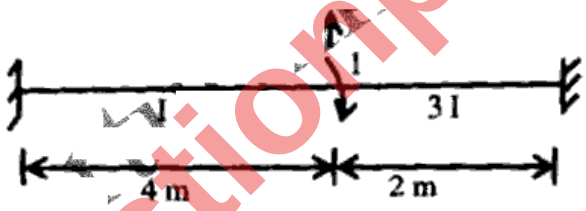
(b) Determine the stiffness matrix for the given beam. Neglect axial deformation. [8]



OR

Q.5 (a) Derive the relation between flexibility and stiffness matrices. [8]

(b) Determine the stiffness matrix for the coordinates mentioned for the given beam. [8]



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