

Roll No. ....

**2040**

**B. E. 3rd Sem. (Civil Engg.) Examination**  
**– December, 2013**

**STRUCTURAL ANALYSIS-I**

**'E' Scheme**

**Paper : CE-201-E**

***Time : Three hours ]***

***[ Maximum Marks : 100***

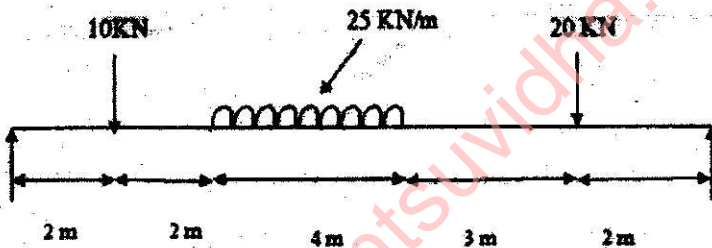
*Before answering the questions, candidates should ensure that they have been supplied the correct and complete question paper. No complain in this regard, will be entertained after examination.*

**Note :** Attempt any *five* questions. All questions carry equal marks.

1. (a) A bar of 30mm diameter is subjected to a pull of 60 kN. The measured extension on a gauge length of 200 mm is 0.09 mm and the change in diameter is 0.0039 mm. Calculate the Poisson's ration and the values of the three moduli. 10
- (b) At a point in a strained material the normal and tangential stresses on two mutually perpendicular planes are given. How to locate the principal plane and determine the principal stresses ? Explain in detail with diagram. 10

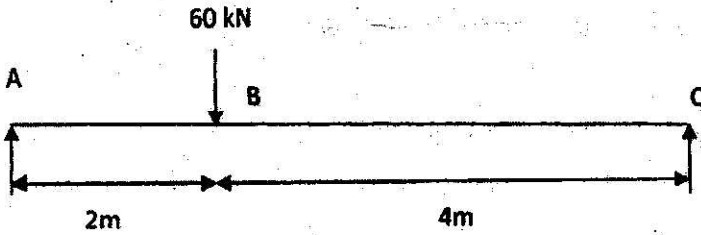
2. What is Euler's theory of long column ? What are the different cases ? How to calculate the effective length and crippling load for different end conditions ? Explain in detail. 20

3. Draw the bending moment and shear force diagram. Explain in detail. 20



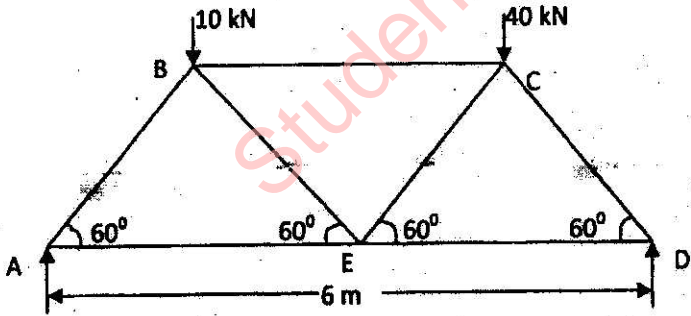
4. A three hinged symmetric circular arch has a span of 36m and a rise of 6m. Determine the bending moment, normal thrust and radial shear at 9m from the left support, if the arch is subjected to a uniformly distributed load of intensity 30kN/m over left half portion and a concentrated load of 60 kN at 27m from the left springing. 20

5. (a) Determine the deflection under the concentrated load and the maximum deflection in the beam shown in figure given below using conjugate beam method. 10



(b) Explain the theorems on which Moment Area Theorem is based. Also derive the moment area theorems. 10

6. Find all the member forces by tension coefficient method. show magnitude and nature of force in a table. 20



7. Explain the following : 20

- (a) Flexure formula
- (b) Unit load method
- (c) Method of Joint
- (d) Slenderness Ratio

**8. Explain the following terms :**

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- (a) Relation between  $E$ ,  $C$  &  $K$ .
- (b) Torsion Equation
- (c) Conjugate Beam method
- (d) Principal of virtual work