No. of Printed Pages : **3 + Drawing Sheet** | **BICE-008**

# B.TECH. CIVIL ENGINEERING

## Term-End Examination

## June, 2013

## BICE-008 : STRUCTURAL ANALYSIS-I



*Time : 3 hours* *Maximum Marks : 70*

***Note :*** *Attempt **any seven** questions. Assume suitable data if **any**.*

**1.** Define : **4x2.5=10**

(a) Temperature stresses

(b) Principle stress and Principle strain

(c) Mohr's circle

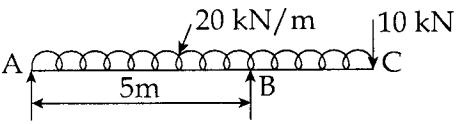
(d) Hoop Stresses

**2.** (a) A copper rod 5 mm in diameter when subjected to a pull of 750 N extends by 0.125 mm over a gauge length of 327 mm. Find the Young mudulus for copper. **5x2=10**

(b) Explain, what is meant by Elastic constants ?

**3.** Compare the section moduli of two beams of the same weight and length, of the first beam is a solid circular beam of diameter d and the second is a circular tube of outer diameter $D_1$ and inner diameter $D_2$. **10**

4. Draw the B.M and S.F diagrams for the over hanging beam camping loads as shown in fig - K. Mark the value of the principle ordinate and locate the point of contra flexure. **10**




5. (a) State and Explain Euler's theory of buckling for different end conditions ? **5x2=10**

   (b) How you will find out the imperfection and residual stresses in columns and struts ?

6. Two planes AB and BC which are at right angles carry shear stresses of intensity 17.5 $N/mm^2$ while these planes also carry a tensile stress of 70 $N/mm^2$ and a compression stresses of 35 $N/mm^2$ respectively. Determine the principle planes and the principle stresses. Also determine the max shear stress and the planes on which it acts. **10**

7. A hollow shaft subject to having an inside diameter 70 % of its outside diameter is to replace a solid shaft transmitting the same power of at the same speed. Calculate the % saving in material , if the material to be used is the same. **10**

8. (a) Differentiate between high strength, steel and concrete. 5x2=10

(b) Discuss the assumption in the behaviour of material under tension and compression bending .

9. Derive the relation between torsion moment, twist and shear stress. 10

10. Write short notes on ***any two*** : 10

(a) Tapering bars and Bars of constant section

(b) Moment of inertia and section modulus

(c) Shear and Torsion.