Roll No. Total No. of Pages : 02

Total No. of Questions : 09

B.Tech. (ME-2011 Batch) (Sem.–3rd)

STRENGTH OF MATERIALS-I

Subject Code : BTME-301

Paper ID : [A1138]

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. Answer briefly :

(a) What is volumetric strain?

(b) Explain limit of proportionality.

(c) What is principal stress?

(d) What is a cantilever?

(e) What is a shear force diagram?

(f) Define section modulus.

(g) What do you understand by torsional rigidity?

(h) Why do we prefer hollow shafts to solid shafts for power transmission?

(i) State two causes of deflection.

(j) What is Hook's law?

CT Inst. o

SECTION-B

2. A rod of length 2 m and diameter 50 mm is
axial force of 400 kN is applied to it. Determ
in the rod. Also calculate the value of modulus
of the rod.

3. Derive expression for the normal and shear st
in a bar subjected to the tensile loading in axi

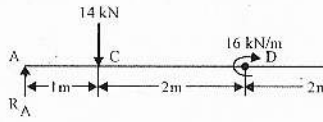
4. State the assumptions made while deriving
stress.

5. Discuss the method of finding deflection in cas

6. Differentiate between strut and column.

SECTION-C

7. Draw the shear force and bending moment di
in the figure below :



8. A hollow shaft of diameter ratio 0.6 is require
speed of 2500 rpm. It is to be fitted with
8 bolts on a circle of diameter twice that of
shear stresses in shaft and bolts are 70 MN/m²
Find the shaft and bolt diameters.

Derive the expressions for Euler's crippling l
end and pin joined at the other.