

(GTU)  
A.D. Patel Institute of Technology  
Internal Test  
Mechanics of Solids

Date: 14/10/08

Time: 8:00 am to 9:00 am

Total Marks: 20

Q.1(A) Determine the resultant of given concurrent forces system. (Fig.1) (03)

(B) Determine the resultant of given Non-concurrent forces system. & find the position of resultant with respect to A. (Fig.2) (04)

(C) Find support reaction of given single overhang beam. (Fig.3) (03)

Q.2(A) Define the following terms (any two) (02)  
Modulus of Rigidity, Stress & Strain, Bulk Modulus

(B) Find out Total Change in Length of given Rectangular bar. (Fig.4) (04)

(C) A copper bar of 36mm diameter is rigidly attached at both ends to the inside of a steel tube which is 50mm in external diameter and 40mm internal diameter. The composite bar is then subjected to an axial pull of 100kN. Find the stress induced in each material. The length of composite bar is 1500mm.  
Take  $E_c = 110\text{kN/mm}^2$   $E_s = 200\text{kN/mm}^2$  (04)

OR

(C) A steel Cube block of 50mm side (all equal side) is subjected to a force of 10kN (Tensile), 12.5kN (Compression), and 7.5kN (Tensile) along x,y,z, direction respectively. Determine the change in volume of the block. (04)  
Take  $E = 2.1 \times 10^5 \text{ MPa}$  & Poisson's ratio is 0.25.

-----Best of Luck-----