

B.Sc I - Preparatory Exam - UNIT III

(12 x 4 = 48)

I. Answer the following

1. (a) Define Elasticity, Stress & Strain. Explain three types of strain. (6m)
- (b) State & Explain Hooke's Law. (2m)
- (c) Define Modulus of elasticity. Explain its types. (4m)
  
2. (a) Derive the relation connecting b/w young's modulus, Bulk modulus & modulus of rigidity. (8m)
- (b) Derive the work-done per unit volume in a deforming body. (4m)
  
3. (a) Derive an equation for time period of Torsion pendulum. (4m)
- (b) Derive an equation for the Bending moments (4m)
- (c) Calculate young's modulus of the material given:  $K = 1.4 \times 10^{11} \text{ Nm}^{-2}$  &  $\eta = 4.2 \times 10^{10} \text{ Nm}^{-2}$ . (4m)
  
4. (a) Give Theory of Cantilever. (8m)
- (b) Find the work done in stretching a wire of 1 sq. mm cross-section & 2m long through 0.1mm. young's modulus,  $\gamma = 2 \times 10^{11} \text{ Nm}^{-2}$ . (4m)