ANURAG GROUP OF INSTITUTIONS
(AUTONOMOUS)
II B. Tech – I Semester   Assignment Paper – I 2018 – 19
Subject:MECHANICS OF SOLIDS

DEPARTMENT OF MECHANICAL ENGINEERING

1. a) Define Stress and Strain? (Level – 2) (CO -1)

    b) A rod 200mm long and of diameter 3 cm is subjected to an axial pull of 30 KN. If the Young's Modulusof the material rod is 2×10^5 N/mm^2, Determine 1. Stress 2. Strain 3. Elongation of the rod.(Level – 3) (CO -1)

2. a) State Hooke's Law?(Level – 2) (CO -1)

    b) A brass bar, having cross-section area of 900 mm^2, is subjected to axial forces as shown in **Fig.1** in which AB=0.6m, BC=0.8m and CD=1.0 m. Find the elongation of the bar. Take E = 2×10^5 N/mm^2. (Level – 3) (CO -1)

3. a) Define Poisons Ratio?(Level – 2) (CO -1)

    b)Determine the values of young's modulus and poisons ratio of metallic bar of length 25 cm breadth of 3 cm and depth 2 cm when the bar is subjected to an axial compressive load of 240 KN. decrease in length is given as 0.05 cm increase in breadth is 0.002 cm. (Level – 3) (CO -1)

4. A tension of a bar 5 m long is made up of two parts 3 m of its length has a cross sectional area of 10cm^2 the remaining 2m has a cross sectional area of 20 cm$^{2.}$ An axial load of 80 kN.is gradually applied. Find the total strain energy produced in the bar and compare this value with that obtained in a uniform bar of the same length and having the same volume when under the same load. Take E=$2*10^5$ N/mm^2.(Level – 3) (CO -1)

5. A cantilever beam of length 2m carries the point loads as shown in **Fig. 2**. Draw SFD and BMD for the cantilever beam.(Level – 3) (CO 2)

6. Define the following terms.(Level – 2) (CO -2)
    a. Shear force
    b. Bending moment
    c. Uniformly distributed load
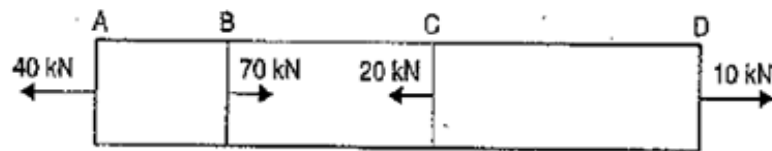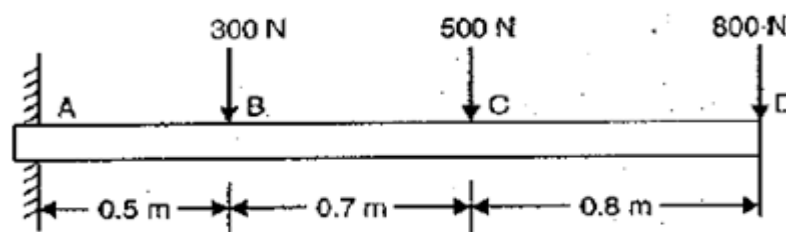   d. Uniformly Varying load
    e. Cantilever beam

Fig: 1

Fig: 2