

JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT  
TEST -1 EXAMINATION- 2024

B.Tech-I Semester (CE)

COURSE CODE(CREDITS): 18B11CE415 (3)

MAX. MARKS: 15

COURSE NAME: Mechanics of Solids

COURSE INSTRUCTORS: Mr. Chandrapal Gautam

MAX. TIME: 1 Hour

*Note: (a) All questions are compulsory. (b) Marks are indicated against each questions.*

*(c) The candidate is allowed to make Suitable numeric assumptions wherever required for solving problems*

- Q1.** With the help of neat diagram, discuss the stress-strain behavior of mild steel under tensile load. CO-1 [3 Marks]
- Q2.** With respect to mechanical properties of a material, explain any three properties mentioned below. CO-1 [3 Marks]  
 a) Elasticity      b) Plasticity      c) Ductility      d) Malleability &      e) Creep
- Q3.** A 200 mm long cylindrical steel tube is subjected to an axial compressive load of 50kN. The inner and outer diameters of the tube are 20 mm and 30 mm respectively. The stress generated in this tube due to the axial compressive load is? CO-2 [3 Marks]
- Q4.** A steel rod 1m long and an aluminium rod 1m long together support a rigid beam of negligible weight as shown in the figure. A load P is hanging from the rigid beam as shown in figure 1. The cross sectional area and modulus of elasticity of steel rod are  $10\text{mm}^2$  and 200 GPa and that of aluminium rod are  $20\text{mm}^2$  and 100 GPa respectively. Find the position of the load for beam to stay horizontal. CO-2 [3 Marks]
- Q5.** Derive the expression for the deflection of a cylindrical rod under its own weight having diameter 'd', unit weight as ' $\gamma$ ' and length of the rod as ' $l$ ' and the modulus of the elasticity is ' $E$ '. The support condition is as shown in figure 2.

