

JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT

TEST -1 EXAMINATION- 2025

B.Tech-IV Semester (CE)

COURSE CODE (CREDITS): 18B11CE415 (03)

MAX. MARKS: 15

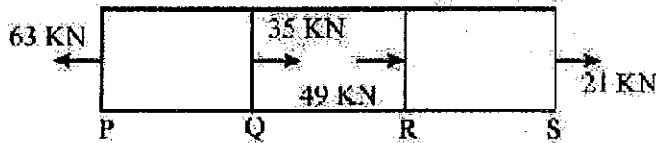
COURSE NAME: Mechanics of Solids

COURSE INSTRUCTORS: Mr. Chandra Pal Gautam

MAX. TIME: 1 Hour

**Note:** (a) All questions are compulsory.

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

Q.No	Question	CO	Marks
Q.1.	Find total elongation of the given bar. Area of the bar is $700\text{mm}^2$ and $E = 2 \times 10^5 \text{ N/mm}^2$ 	1	3
Q.2.	(i) Draw stress strain diagram of mild steel and mention different zone in the diagram. (ii) Define proof stress and its application.	1	(2+1) = 3
Q.3.	A mild steel bar, circular in cross section, tapered from 40mm diameter to 20mm diameter over its length of 800mm. It is subjected to an axial pull of 20kN. $E = 2 \times 10^5 \text{ N/mm}^2$ . Find the elongation in the bar.	1	3
Q.4.	A metal bar of length 200 m is inserted between two rigid supports and its temperature is increased by $50^\circ\text{C}$ . If the coefficient of thermal expansion is $15 \times 10^{-6}/^\circ\text{C}$ and $E = 2 \times 10^5 \text{ N/mm}^2$ , then find the force generated on the supports.	2	3
Q.5.	A material has $E = 1.25 \times 10^5 \text{ N/mm}^2$ and poisson's ratio of 0.25. Find modulus of rigidity and bulk modulus of the material.	2	3