

Code: EC2T3

I B.Tech - II Semester – Regular Examinations – April 2016

**ELEMENTS OF MECHANICAL ENGINEERING
(ELECTRONICS & COMMUNICATION
ENGINEERING)**

Duration: 3 hours

Max. Marks: 70

PART – A

Answer *all* the questions. All questions carry equal marks

11x 2 = 22 M

1.

- a) Where the split patterns are used and what is the advantage?
- b) What do you understand by the terms ‘mould’ and ‘core’?
- c) What is the difference between arc welding and gas welding process?
- d) What is the difference between centre of gravity and centroid?
- e) Explain about the Magnetic Hysteresis in Magnetic Properties of materials.
- f) Determine the moment of Inertia of rectangular of width ‘b’ and depth ‘d’ about the centroidal axis.

- g) State the difference between intensive property and extensive property.
- h) Explain first law of thermodynamics.
- i) Distinguish between petrol engines and diesel engines.
- j) State Zeroth law of thermodynamics.
- k) A circular rod of diameter 20 mm and 500 mm long is subjected to tensile force of 45kN. The Modulus of elasticity for steel may be taken as 200kN/mm^2 . Find stress, and strain of bar due to applied load.

PART – B

Answer any ***THREE*** questions. All questions carry equal marks.

3 x 16 = 48 M

2.

- a) Discuss the various properties moulding sand. 8 M
- b) Explain the principle of gas welding. What are the various types of flames produced for gas welding and what are their respective uses? 8 M

3.

- a) Explain stress strain diagram for mild steel. 6 M
- b) Define the following 8 M
 - (i) Poisson ratio ii) Factor of safety
 - (iii) Elastic moduli iv) Volumetric

c) Distinguish between elasticity and Plasticity 2 M

4. Determine the moment of inertia of built-up section shown in Fig.1. about its centroidal axes $x-x$ and $y-y$. 16 M
All dimensions are in mm.

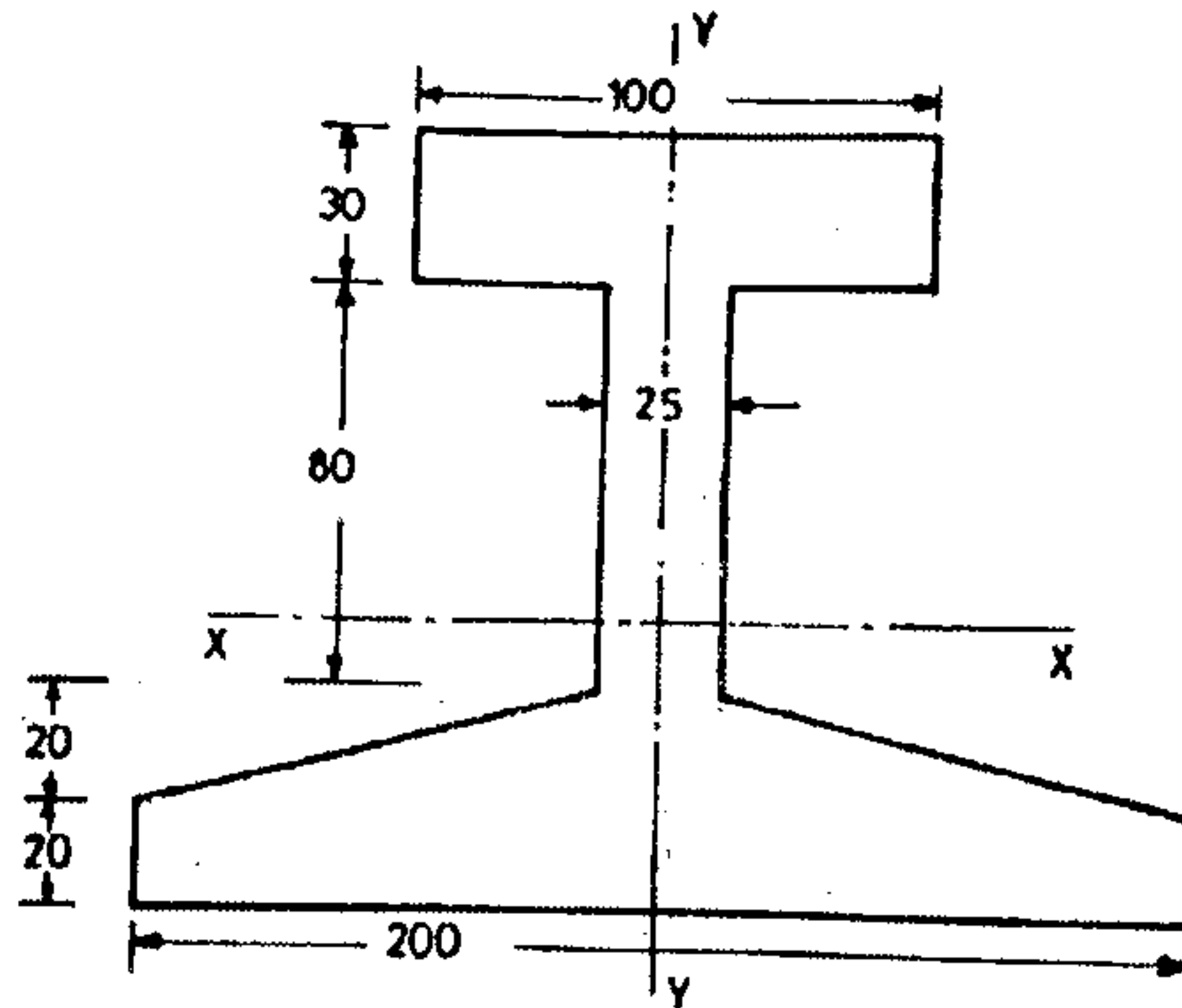


Fig. 1

- 5.
- a) Explain reversible process and irreversible process. 8 M
- b) What is thermodynamic equilibrium? Explain the significance of quasi-static process. 8 M
- 6.
- a) Draw neat sketch of 4-stroke Petrol engine and label various parts and give their material and describe their functions. 10 M
- b) What is the difference between 2-stroke and 4-stroke engine. 6 M