

Code: EC2T3

**I B.Tech - II Semester – Regular/Supplementary Examinations
April - 2018**

**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) What is a quasi-static process?
- b) What do you mean by ‘reversible work’?
- c) Define the terms welding and weldability.
- d) Define poisson’s ratio and volumetric strain.
- e) What are the electrical properties of materials?
- f) Give the position of centroid of
 - i) rectangle
 - ii) triangle
- g) State Perpendicular axis theorem.
- h) Explain the working of 2-stroke petrol engine.
- i) Discuss the various types of I.C. engines.
- j) What are the applications of Casting?
- k) State any four types of patterns.

PART – B

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

3 x 16 = 48 M

2. a) What are the different methods of arc welding? 4 M
- b) Differentiate between the casting and pattern. Explain various allowances provided in pattern making and the reasons for it. 12 M
3. a) Draw stress-strain diagram for ductile material. Explain the behavior with the help of the diagram. 10 M
- b) Explain Factor of safety. Express the relation between E, G and K. 6 M
4. Determine the moment of inertia of rectangular section about x-x and y-y axes passing through the centroid are $250 \times 10^6 \text{ mm}^4$ and $40 \times 10^6 \text{ mm}^4$ respectively. Calculate the size of the section. 16 M
5. Explain: a) zeroth law of thermodynamics
b) First law of thermodynamics
c) Second law of thermodynamics 16 M
6. a) Contrast a 4-stroke engine and 2-stroke engine. 8 M
- b) Contrast petrol engine and diesel engine. 8 M