

Code: EM2T5, ME2T5

**I B.Tech-II Semester-Regular Examinations - July 2013**

**BASIC MECHANICAL ENGINEERING**  
**(For Mechanical & Electronics Computer Engineering)**

Duration: 3 hours

Marks: 5x14=70

Answer any FIVE questions. All questions carry equal marks

- 1 a) What are different materials used for patterns and explain the common allowances provided on them. 7 M
- b) Discuss the moulding materials, equipment and preparation. 7 M
- 2 a) Distinguish between soldering and brazing. 7 M
- b) Explain in detail how the taper turning operation is done on a lathe machine. 7 M
- 3 a) Discuss in detail the various types of belt drives used for power transmission. 7 M
- b) Discuss the merits and demerits of gear drive over a belt drive for power transmission. 7 M

- 4 a) Explain the working principle of thermal power plant with neat sketch. 7 M
- b) Write a note on alternate energy resources with neat sketches. 7 M
- 5 a) What is Refrigeration? Discuss the major applications of refrigeration. 7 M
- b) Explain the principle & working of Vapour Compression Refrigeration System with a neat sketch. 7 M
- 6 a) What is an IC engine? Describe the main components of IC engine with neat sketches. 7 M
- b) Differentiate petrol engines and diesel engines. 7 M
- 7 a) Explain the terms Factor of safety, Lateral strain and Poisson's ratio. 7 M
- b) A mild steel rod of 20mm diameter and 300mm long is enclosed centrally inside a hollow copper tube of 30mm external diameter and 25mm internal diameter. The ends of the rod and tube are brazed together, and the composite bar is subjected to an axial pull of 40kN. If  $E$  for steel and copper is  $200\text{kN/mm}^2$  and  $100\text{ kN/mm}^2$  respectively, find the stresses developed in the rod and the tube. Also find the extension of the rod. 7 M

- 8 a) Briefly explain the various physical properties of materials. 7 M
- b) Briefly discuss about conductivity, resistivity and dielectric strength of materials. 7 M