No. of Printed Pages : 2

**BIME-005**

00569

# B.Tech. MECHANICAL ENGINEERING (BTMEVI)

## Term-End Examination

## June, 2011

## BIME-005 : MATERIAL SCIENCE

*Time : 3 hours* *Maximum Marks : 70*

***Note :*** *There are seven questions. Attempt* ***any five*** *questions. All questions carry* ***equal*** *marks.*

**1.** (a) Describe briefly Bohr's atomic model, quantum numbers and Pauli's exclusion principle. 7

(b) Draw the plane in the following a fcc structures : (1,1,2), (0,0,1) and (1,0,1) 7

**2.** (a) Define the following terms : 7

(i) Ductility

(ii) Hardness

(iii) Toughness

(b) Draw the stress-strain diagram for mild steel and describe it in brief. 7

**3.** (a) Distinguish between slip and twin mechanisms of plastic deformation in metals. 7

(b) Distinguish between elastic and plastic deformation of metals. Define yield stress and uniform elongation. 7

4. (a) Discuss with examples the ductile and brittle fracture. 7

(b) How does creep differ from high temperature fatigue ? Explain different stages of creep. 7

5. (a) Describe following heat treatment procedure : 7

(i) Full annealing

(ii) Normalizing

(b) Describe TTT curve for eutectoid steel 7

6. (a) Distinguish between paramagnetism and ferromagnetism. 7

(b) What are hard and soft magnetic materials ? Explain by giving examples and applications. 7

7. Write down short note on ***any four*** : 14

(a) Hysteresis loss

(b) Eddy current loss

(c) Austempering

(d) Permalloys

(e) Cold working and hot working process

(f) Preferred orientation