

Q.P. Code: 22676

(3 Hours)

[Total Marks: 80]

N.B. 1) Question No.1 is compulsory

- 2) Attempt any three questions from remaining five questions.
- 3) Draw neat labeled sketches
- 4) Figure at right side indicate marks

Q1. Attempt any four questions.

20

- a) Describe toughening mechanism in ceramics.
- b) Enlist types of cast iron and write two application of Grey cast iron.
- c) Describe different types of point defects in crystals.
- d) Describe semiconductor materials along with two examples.
- e) Enlist unique features of Nano-structured materials.

Q2. (a) Enlist different types of surface defects. Describe sub-angle grain boundary, stacking fault and their significance. 10

(b) Classify different types of Magnetic materials. Explain metallic and ceramic magnetic ceramic magnetic materials. List applications of magnetic materials. 10

Q3. (a) Differentiate between ductile and brittle fracture. 05

(b) Define fatigue and explain the significance of cyclic stress. 05

(c) Describe following processes - Annealing, Normalizing, Tempering, Surface Hardening 10

Q4. (a) Draw Iron-Iron Carbide diagram and explain Eutectic transformation in detail. 10

(b) Describe smart materials with examples. Describe chromic materials. 10

Q5. (a) Give classification of polymers. Describe thermosetting polymers and Elastomers. 10

(b) Explain in detail creep testing mechanism along with diagrams. 10

Q6. (a) Explain alloys of copper along with their properties & applications. 10

(b) Explain the following - (i) Lasers (ii) Optical fibers in communication. 10