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Total No. of Pages : 01

Total No. of Questions : 08

M.Tech.(PE) (E-II) (Sem.–2)

MATERIALS TECHNOLOGY

Subject Code : PE-517

Paper ID : [E0454]

Time : 3 Hrs. Max. Marks : 100

INSTRUCTION TO CANDIDATES :

1. Attempt any FIVE questions out of EIGHT questions.
2. Each question carry TWENTY marks.

1. a) Explain, why the properties of polycrystalline materials are most often isotropic. (6)

   b) Discuss the mechanism of plastic deformation in polycrystalline materials. (14)

2. a) Differentiate between the fracture of mild steel and cast iron specimens in tensile testing. (10)

   b) Discuss the mechanism of strain hardening in metals. (10)

3. Define fracture and give a classification of fracture. State Griffith's theory of brittle fracture and derive Griffith's equation. (20)

4. a) Explain fatigue limit with the help of S-N curve. In what way S-N curves for ferrous materials are different non-ferrous materials. (10)

   b) Define creep. Explain various mechanisms of creep failure. (10)

5. a) List and discuss the role of additives used in plastics. (6)

   b) What are ceramics? List their salient properties. Differentiate between the silicate chain and sheet structures. (14)

6. a) List four reasons why glass fibers are most commonly used for reinforcement. (6)

   b) Give a comparison of PMCs and MMCs, stating their advantages and limitations. (14)

7. List various techniques used for depositing thin films on metals and non-metals. Explain any one of them in detail, including its principle, advantages and limitations. (20)

8. a) Explain the principle of Eddy current testing and discuss its applications. (8)

   b) Explain the basic principle of Ultrasonic testing technique. Also discuss the advantages and limitations of this technique. (12)