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BIME-005

B.Tech. - VIEP - MECHANICAL ENGINEERING

(BTMEVI)

Term-End Examination, 2019

BIME-005 : MATERIAL SCIENCE

Time : 3 Hours]

[Maximum Marks : 70

Note : Attempt any five questions. All questions carry equal marks.

1. (a) Describe briefly the classification of materials. Distinguish between an alloy and a compound. [7]
- (b) How does dislocation affect the strength and plastic deformation of metals and alloys ? Elaborate in detail. [7]
2. (a) Describe the behaviour of electrical conductivity in ceramics. Also explain the behaviour of super conductivity in metals and alloys. [7]
- (b) Describe in brief the Time-Temperature-Transformation (T-T-T) curve for steel. [7]

3. (a) What is Corrosion ? Describe the factors which accelerate the Corrosion process. Explain briefly the techniques used in preventing Corrosion of metals. [7]
- (b) What do you mean by Dislocation ? Explain edge dislocation and line dislocation. [7]
4. (a) Explain how the toughness of a material is measured. [7]
- (b) Define Intrinsic and Extrinsic Semiconductors. Explain how holes and electrons are created in an intrinsic silicon semiconductor. [7]
5. (a) State how carbon content influences the strength and ductility of plain carbon steel. [7]
- (b) Explain the meaning of critical rate of cooling. Specify the critical rate of any two plain carbon steels. [7]
6. (a) Explain the mechanism of crack initiation and growth when metal is subjected to cyclic loading. [7]
- (b) Distinguish between the structure and properties of thermosetting and thermoplastic resins. [7]

7. Write short notes on any four of the following :[4×3.5=14].

- (a) Chemical bonding
- (b) Cold working process
- (c) Doping in semiconductors
- (d) Piezo electricity
- (e) Dielectric materials
- (f) Atomic packing factor

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