

**B.Tech. MECHANICAL ENGINEERING
(COMPUTER INTEGRATED
MANUFACTURING) /**

**B.Tech. AEROSPACE ENGINEERING (BTAE) /
BTMEVI**

Term-End Examination

00004

June, 2017

BME-018 : ENGINEERING MATERIALS

Time : 3 hours

Maximum Marks : 70

Note : Answer any **five** of the following questions. Use of calculator and log table is allowed.

1. (a) Differentiate between ductile and brittle materials. List down their applications. 7

- (b) A steel specimen shows upper yield point at 218 MPa and lower yield point at 206 MPa. If the modulus of elasticity (E) is 220×10^3 MPa, calculate the modulus of resilience. 7

2. With the help of neat sketch of the Iron Carbon diagram, describe the following : 14
- (a) Pearlite
 - (b) Ferrite
 - (c) Cementite
 - (d) Austenite
 - (e) Ledeburite
3. (a) Describe the properties of carborundum and write the uses of carborundum. 7
- (b) What is Glass ? What are the properties of glass that make it a good engineering material ? 7
4. (a) What are the properties of plastics that differ from those of metals ? Give the engineering applications of plastic. 7
- (b) How is rubber obtained ? Discuss the uses of natural rubber. 7
5. (a) Describe the three basic reasons of brittle fracture. How can it be eliminated ? Give examples of fracture causing failure of structure. 7
- (b) What is Irwin's criterion of fracture ? Describe a simple procedure of determining fracture toughness in a lab. 7

6. (a) Explain any two methods of protection against corrosion. 7
- (b) Define the term Lubricant. Also, describe the functions of a lubricant. 7
7. Write short notes on any **four** of the following : $4 \times 3 \frac{1}{2} = 14$
- (a) Application of Plain Carbon Steel
 - (b) Hardenability
 - (c) TTT Diagram
 - (d) Chemical Composition of High Speed Steel and the effect of alloying element on H.S.S.
 - (e) Bonding Materials used for making a Grinding Wheel
 - (f) Mechanical Properties of Composites
 - (g) Tool Wear and methods of protecting cutting edge of a tool
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