No. of Printed Pages : 3

BME-018

02935

BACHELOR OF TECHNOLOGY IN MECHANICAL ENGINEERING (COMPUTER INTEGRATED MANUFACTURING)

B.Tech. (Aerospace Engineering) (BTMEVI)

Term-End Examination

June, 2012

BME-018 : ENGINEERING MATERIALS

Time : 3 Hours *Maximum Marks : 70*

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

1. (a) What is stainless steel ? Mention those properties which distinguish stainless steel from plain carbon steel. 7

   (b) List aluminium alloys commonly used for engineering applications. Give their properties and applications. 7

2. (a) How is silicon carbide protected from oxidation at high temperature ? Explain. 7

   (b) What is abrasive ? Which materials are used for abrasive cutting ? Compare their hardness. 7

3. From creep tests on 713C alloy the constant C in Larson - Miller parameter is determined as -85.75. In rupture test a specimen of this material fails after 500 hours at 34 MPa and 1373K while another specimen at a stress level 136 MPa and at temperature of 1308K fails after 3 hours. Calculate stress to cause failure after 30,000 hours at 1173K. **14**

4. (a) Describe three basic structure of a polymers. Which structure is preferable for mechanical strength ? **7**

   (b) What is an adhesive ? Distinguish between structural and non - structural adhesives. **7**

5. (a) What are the two requirements that a specimen must fulfill for fracture toughness determination ? **6**

   (b) How is Griffith theory modified to consider plastic deformation in close vicinity of crack tip ? **8**

6. (a) Explain dry friction, boundary lubrication and film lubrication. **6**

   (b) Explain different methods of surface treatment. **8**

7. (a) Define modulus of resilience and modulus of toughness. **4x3½=14**

(b) Distinguish between killed and semi - killed steels.

(c) Describe various types of insulators.

(d) How are composite cylinders and tubes manufactured ?