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BME-018

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BACHELOR OF TECHNOLOGY IN MECHANICAL ENGINEERING (COMPUTER INTEGRATED MANUFACTURING)
B.Tech. (Aerospace Engineering)

Term-End Examination

December, 2010

BME-018 : ENGINEERING MATERIALS

Time : 3 hours *Maximum Marks : 70*

Note : Anwer **any five** *questions. Each question carries 14 marks. Assume suitable data if* ***required.***

1. (a) What is creep? Explain characteristic creep curve with various stages. Also discuss about the temperature and stress on the creep behaviour. 7

   (b) Define the term fatigue with fatigue curves. Briefly discuss the factors affecting the fatigue behaviour of material and explain the fatigue mechanism. 7

2. (a) Draw Iron-Carbon equilibrium diagram with neat sketch. Also discuss various terms used in Iron-Carbon equilibrium diagram. 7

   (b) Discuss various objectives of heat treatment processes. Define the term hardenability with factors affecting it. Also explain the joining hardenability test. 7

3. (a) What are the purposes of adding alloying elements in the steels? Discuss the effect of alloying elements on the performance of steel. 7

(b) Explain fatigue crack propagation mechanism. Discuss the crack length variation with component life with schematic diagram. 7

4. (a) Explain Griffith's criterion of fracture. Also discuss the modified Griffith's theory. 7

(b) Discuss various types of cracks and modes of material deformation. 7

5. (a) Explain in brief the flame hardening and Induction hardening processes. 7

(b) Discuss about Annealing and Normalising heat treatment processes. 7

6. (a) List various surface treatment processes and discuss about any two. 7

(b) Discuss about cutting tool materials. 7

7. Write short notes on the following ***(any four)***. **3.5x4=14**

(a) Polymerisation of Plastics.

(b) Composite materials.

(c) Refractory materials.

(d) Ceramic materials.

(e) Aluminium Alloys.