

**B. Tech. 5th Semester (F) Scheme (AUE) Examination,
December-2018**

MATERIALS SCIENCE TECHNOLOGY

Paper-AUE-305-F

Time allowed : 3 hours]

[Maximum marks : 100

Note : Students have to attempt five questions in total with at least one question from each section and Question No. 1 is compulsory.

1. (a) Explain the terms slip and twin.
 - (b) What is work hardening (strain hardening)?
 - (c) What is Bauschinger effect ?
 - (d) Define the hot and cold working.
 - (e) What is creep and fracture ?
 - (f) What is normalizing and spheroidizing ?
 - (g) What is equilibrium diagram ?
 - (h) Write down the mode of fracture.
 - (i) What is case hardening ?
 - (j) What is fretting ?
- 20

Section-A

2. (a) How does the interaction between the dislocations and vacancies affect the physical properties of a metal ?
- 10
- (b) State the difference between elastic and plastic deformation. Explain each in detail.
- 10

3. Explain Iron-carbon equilibrium diagram. Explain each constituent present in the iron-carbon equilibrium diagram. 20

Section-B

4. (a) What is ductile and brittle fracture ? Explain the stages in development of ductile fracture. 10
 (b) Explain the fatigue test with the help of S-N curve. 10
5. (a) What is the effect of following variable on fatigue
 (i) Size of sample
 (ii) Temperature
 (iii) Corrosion 10
 (b) Explain the effect of metallurgical variables on Creep. 10

Section-C

6. (a) What is composite ? Classified various types of composite. 10
 (b) Describe the criteria for selecting the materials of Cylinder block and Cylinder head. 10
7. Write short notes on :
 (a) formability and weldability of steel 10
 (b) materials for high temperature 10

Section-D

8. (a) Write a brief essay on annealing of non-ferrous metals. 10
 (b) Define the term hardenability. What factor affects hardenability ? Describe a method for determining the hardenability of steel. 10
9. Explain the following : 20
 (a) Carburizing
 (b) Cyaniding
 (c) Flame hardening

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