

B TECH
(SEM VIII) THEORY EXAMINATION 2018-19
ADVANCE MATERIALS TECHNOLOGY

Time: 3 Hours

Total Marks: 100

Note: Attempt all Sections. If require any missing data; then choose suitably.

SECTION A

- 1. Attempt *all* questions in brief. 2 x 10 = 20**
- a. Differentiate between plain carbon steel and tool steel.
 - b. Discuss any two alloying elements and their effect on plain carbon steel.
 - c. What is the application of TTT diagram?
 - d. Define annealing of steel.
 - e. What are shape memory alloys?
 - f. Describe precipitation hardening.
 - g. What are biocompatible materials?
 - h. Define material properties of skin.
 - i. Differentiate between fusion and fission reactors.
 - j. What is the role of moderator in a nuclear reactor?

SECTION B

- 2. Attempt any *three* of the following: 10x3=30**
- a. What do you mean by High temperature resisting steels? Explain its advantages over other steels.
 - b. Describe in brief about properties and application of plain carbon steel.
 - c. Discuss in brief about microscopic determination of case depth and depth of hardening.
 - d. What are the advantages of nonferrous materials? Write the name of some nonferrous material and its application.
 - e. Briefly discuss the radioactive waste disposal.

SECTION C

- 3. Attempt any *one* part of the following: 10x1=10**
- a. Describe the various types of cast irons on the basis of their mechanical properties.
 - b. Write a brief note on high strength steels and their applications.
- 4. Attempt any *one* part of the following: 10x1=10**
- a. Discuss the austempering and martempering of steels. What are the mechanical properties that improve due to these processes?
 - b. Write a brief note on surface hardening of steels.
- 5. Attempt any *one* part of the following: 10x1=10**
- a. What are smart materials? Discuss their advantages and applications.

- b. Discuss different types of composite materials technology along with their advantages and disadvantages.

6. Attempt any *one* part of the following: 10x1=10

- a. Explain the stress strain behavior of bone. Also write application of biomaterials in medicine & dentistry.
- b. Discuss in brief the effects of degradation and corrosion?

7. Attempt any *one* part of the following: 10x1=10

- a. Write the name of some control and construction materials of nuclear reactor and also write its advantages over other.
- b. Discuss and differentiate between the fissile and fertile materials.