Printed Pages:02 **Sub Code: NOE037/EOE037**

Paper Id: 199327 **Roll No.** | | | | | | | | | | |

B TECH
(SEM III) THEORY EXAMINATION 2018-19
MATERIAL SCIENCE

Time: 3 Hours ***Total Marks: 100***

Note: 1. Attempt all Sections. If require any missing data; then choose suitably.

SECTION - A

1. Attempt all questions in brief. **02*10 = 20**

a) What is duralumin? Give the composition and application.
b) Differentiate between edge dislocation and screw dislocation.
c) What is "miller indices".
d) Explain the term 'NDT'?
e) Explain and differentiate between addition polymerization and condensation polymerization.
f) Why Yield points occurs in low carbon steel.
g) What is 'Avogadro's number'?
h) What is 'Nanotechnology'?
i) Explain 'Biomaterials' and its applications.
j) What is a primary bond?

SECTION – B

2. Answer any three of the following **10*03=30**

a) Derive Bragg's law equation. Explain the meaning of first order, second order and third order reflections.
b) What is the necessity of knowing the stress strain diagram? What are the utilities of these curves to a production engineer?
c) Why do we perform normalizing? Explain any hardening method and applications for which it is most suited.
d) Explain the phenomena of superconductivity and Meissner effect. Describe silent characteristics and applications of superconductors.
e) What are some method by which processing of ceramics materials in carried out? What are the applications of ceramic materials?

SECTION –C

3. Attempt any one part of the following: **10*01 = 10**

a) The density of iron is 7.86 gm/cm^3 and the atomic weight is 55.85. Calculate its atomic radius.
b) Define atomic packing factor. Obtained its expression for SC, FCC, and BCC.

4. Attempt any one part of the following: **10*01 = 10**

a) What you understand by lever rule. Determine the mass fraction of the phases present at 184^{0}C in a sample of lead & tin with 45% tin in it.
b) Explain the mechanism involved in creep occurrence. Suggest materials to prevent or minimize creep in metals and nonmetals.

5. Attempt any one part of the following: 10*01 = 10

a) Draw Iron Curve equilibrium diagram and show their silent features. Indicate significance of this diagram for heat treatment of steel.

b) Write down the purpose, procedure and phases present for following transformation processes of steel: Annealing, Quenching, Interrupted quench, Austempering and Tempering.

6. Attempt any one part of the following: 10*01 = 10

a) Enumerate the characteristics of a good conductor. Discuss the effects of various factors on resistivity of conducting materials.

b) Describe the phenomenon of magnetic hysteresis. Why does it occur for ferromagnetic and ferromagnetic materials?

7. Attempt any one part of the following: 10*01 = 10

a) Discuss the electrical behavior of ceramics, and mechanical behavior of plastics. What is the future of composite materials?

b) Describe different methods of corrosion prevention.