Printed Pages: 02 **Sub Code: ROE047**

Paper Id: | 1 | 9 | 9 | 4 | 3 | 2 | **Roll No.** | | | | | | | | | | |

B.TECH
(SEM- IV) THEORY EXAMINATION 2017-18
MATERIAL SCIENCE

Time: 3 Hours ***Total Marks: 70***

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

SECTION A

1. Attempt *all* questions in brief. 2 x 7 = 14

a. What do you understand by NDT testing?
b. Write the applications of brass and bronze.
c. What are non crystalline solids? Give an example.
d. Differentiate between hard and soft magnetic materials.
e. Why is heat treatment done? Name the different heat treatment process.
f. Explain Meissner Effect.
g. What are refractory materials? Give some examples.

SECTION B

2. Attempt any *three* of the following: 7 x 3 = 21

a. How many atoms per square millimeter are there on the (1 0 0) plane of lead. Lead has FCC structure. Assume the interatomic distance to be 3.499 Å.
b. What is the basic mechanism of super conduction? Explain type-1 and type-2 super conductors.
c. What is phase diagram? Draw a neat sketch of iron-carbon diagram and explain the various phases present in it and the important reactions occurring.
d. What are the different types of carbon steels? Explain their general properties and applications.
e. Explain in detail composites and classification of composites.

SECTION C

3. Attempt any *one* part of the following: 7 x 1 = 7

(a) What do you mean by heat treatment process? Name various hardening processes. Explain flame hardening process in detail.
(b) What is creep? Explain the mechanism and the stages of it.

4. Attempt any *one* part of the following: 7 x 1 = 7

(a) Draw hysteresis curve and explain it in detail. What is the roll of domains for it?
(b) Write short notes on ceramic material and its application.

5. Attempt any *one* part of the following: 7 x 1 = 7

(a) What is corrosion? Briefly describe types of corrosion and methods for corrosion prevention?

(b) Explain Rutherford atomic model. Write its limitations.

6. Attempt any *one* part of the following: 7 x 1 = 7

(a) Explain the method of measuring the grain size as recommended by ASTM.

(b) Explain the edge and screw dislocations with the help of neat sketch.

7. Attempt any *one* part of the following: 7 x 1 = 7

(a) Define the term microstructure. What are the steps involved in the study of microstructure of metals?

(b) What are general alloying elements for steel and what are their effects on it? Explain in detail.