

Paper Id: **199356**

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B. TECH
(SEM -III) THEORY EXAMINATION 2019-20
MATERIAL SCIENCE

Time: 3 Hours**Total Marks: 100****Note:** Attempt all Sections. If require any missing data; then choose suitably.**SECTION A**

- a. What is phase in materials?
- b. Compare annealing and normalizing.
- c. Why yield-point occur in low-carbon steel?
- d. Explain binary phase diagram.
- e. Differentiate toughness and resilience.
- f. What is superconductivity?
- g. Define dielectric materials.
- h. Define creep with example.
- i. What are the objectives of heat treatment?
- j. Explain the properties of stainless steel with application.

SECTION B**2. Attempt any three of the following:****10 x 3 = 30**

- a. Draw and explain TTT diagram for eutectoid steel. Explain important transformation taking place in it on cooling.
- b. Draw stress-strain curve for mild-steel and explain various points on this diagram
- c. Explain in brief creep test and what is its importance?
- d. Distinguish between Type-I and Type-II super conductors with suitable curves and examples.
- e. What are some method by which processing of ceramic material is carried out? What are the applications of ceramic materials?

SECTION C**3. Attempt any one part of the following:****10 x 1 = 10**

- (a) What is solid solution? Enlist types of solid solution and explain it.
- (b) Differentiate between ferrous and non-ferrous material with suitable examples.

4. Attempt any one part of the following:**10 x 1 = 10**

- (a) What do you mean by engineering materials? Give a detailed classification of engineering materials with suitable examples.
- (b) A hardened steel ball of 0.50 cm diameter is used to indent a steel specimen in Brinell hardness test. Diameter of indentation measured by an optical microscope of magnification 10 X is observed to be 32.5mm Calculate Brinell hardness number of the steel specimen.

5. Attempt any one part of the following:**10 x 1 = 10**

- (a) Write short note on
 - (i) Eutectoid steel
 - (ii) Hypo and hypereutectoid steel
- (b) Discuss the effect of alloying elements on the properties of steel.

6. Attempt any one part of the following:**10 x 1 = 10**

- (a) What is the roll of domains for differentiating between hard and soft magnetic materials?
- (b) Draw the hysteresis curve and explain it in detail

7. Attempt any one part of the following:**10 x 1 = 10**

- (a) What are smart materials? Describe optical fiber and its application with suitable examples.
- (b) Write short note on composite materials. Give a detailed classification of composite material along with their properties.