Paper Id: 120301 Roll No: | | | | | | | | | | | | | |

# B. TECH
## (SEM-III) THEORY EXAMINATION 2019-20
## ELECTRICAL AND ELECTRONICS ENGINEERING MATERIALS

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

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

### SECTION A

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

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|---|---|
| a. | What is curie temperature? |
| b. | How does the function of a dielectric differ from an insulator? |
| c. | Name the test performed on transformer oil. |
| d. | Define magnetic anisotropy and magnetic reluctance. |
| e. | Define breakdown voltage and dielectric strength. |
| f. | Explain P –Type semiconductor. |
| g. | Distinguish between soft and hard magnetic material. |

### SECTION B

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

| | |
|---|---|
| a. | Derive the expression of dielectric losses and loss tangent. |
| b. | What are ferrites? Discuss their properties. Name two ferrites and give their one application. |
| c. | Explain different integration techniques- Large and very large scale integration techniques (VLSI) in detail. |
| d. | Explain the factor on which Material used for Resistors, rheostats, heaters, transmission line structures. |
| e. | Discuss following structural materials: Wooden poles, RCC poles, Steel poles |

### SECTION C

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

| | |
|---|---|
| (a) | Describe the behavior of dielectrics in alternating fields and use it to explain the phenomenon of dispersion. |
| (b) | Explain the terms piezoelectricity and ferroelectricity. Discuss the materials having these properties and there uses. |

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

| | |
|---|---|
| (a) | Explain the classification of magnetic materials with comparison chart. |
| (b) | Write short note on- feebly magnetic materials, Magnetostriction. |

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

| | |
|---|---|
| (a) | What is a PN junction diode, how it is formed, also I-V characteristics of diode. |
| (b) | Explain the classification of semiconductor material with their properties. |

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

| | |
|---|---|
| (a) | Explain in detail material used for heating devices, material used for rheostats. Determine the temperature coefficient of resistance of material used in a resistor if the resistance at 25°C is 50ohms and 70°C is 57.2 ohms. |
| (b) | Write properties of solid Liquid and Gaseous insulating materials & Effect of moisture on insulation on it. |

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

| | |
|---|---|
| (a) | Why testing is needed for transformer oil, explain all the tests that are performed for testing of transformer oil. |
| (b) | Write short Note on - Properties and applications of mineral oils, steps to Processing of electronic materials. |