

USN

--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

10EE666

**Sixth Semester B.E. Degree Examination, Aug./Sept. 2020**  
**Electrical Engineering Materials**

Time: 3 hrs.

Max. Marks: 100

**Note: Answer any FIVE full questions, selecting atleast TWO questions from each part.**

**PART – A**

- 1 a. Explain Fermi Dirac Distribution. (05 Marks)
- b. Discuss briefly the various types of resistors commonly used in electrical engineering. (10 Marks)
- c. Discuss the materials for fuses. Explain its working. (05 Marks)
- 2 a. Write a note on intrinsic and extrinsic semiconductors. (05 Marks)
- b. Write a short note on hall effect. (05 Marks)
- c. Calculate the current produced in a small germanium plate of area  $1\text{cm}^2$  and of thickness  $0.3\text{mm}$  when a potential difference of  $2\text{V}$  is applied across the faces. Given concentration of free electron in germanium is  $2 \times 10^{19}/\text{m}^3$  and mobilities of electrons and holes are  $0.36\text{m}^2/\text{v-s}$  and  $0.17\text{m}^2/\text{v-s}$  respectively. (05 Marks)
- c. List the differences between hard and soft magnetic materials. (05 Marks)
- 3 a. What is polarization? Explain the different types of polarization. (10 Marks)
- b. Explain the significance of dielectric loss tangent in alternating fields. (10 Marks)
- 4 a. How are the insulating materials classified? What are the general properties of good insulating materials? (10 Marks)
- b. List out the properties of  $\text{SF}_6$  gas. (05 Marks)
- c. Why is transformer oil considered as the best cooling agent and insulator? (05 Marks)

**PART – B**

- 5 a. Explain the working of solar photo voltaic cell with a neat figure and write the equivalent circuit and V-I characteristics. (12 Marks)
- b. Explain selective absorber coating. What are the selective coating properties. (08 Marks)
- 6 a. With suitable diagram explain the construction and working of NMR spectrometer. (10 Marks)
- b. With a neat sketch explain electron microscopy. (10 Marks)
- 7 a. What is piezoelectricity? Explain the working of piezoelectric device and hence state advantages and disadvantages with applications. (10 Marks)
- b. Explain ferromagnetic materials. (05 Marks)
- c. Explain the magnetostrictive materials. (05 Marks)
- 8 a. What is ceramics? Explain the AC properties of ceramics as a capacitor. (10 Marks)
- b. What are plastics? Explain the properties of plastics, its classification and hence explain thermoplastics. (10 Marks)

CMRIT LIBRARY  
BANGALORE - 560 037

\* \* \* \* \*

Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.  
2. Any revealing of identification, appeal to evaluator and /or equations written eg,  $42+8 = 50$ , will be treated as malpractice.



