

GUJARAT TECHNOLOGICAL UNIVERSITY**BE - SEMESTER-VI(NEW) EXAMINATION – WINTER 2022****Subject Code:3160923****Date:15-12-2022****Subject Name:Electrical Materials****Time:02:30 PM TO 05:00 PM****Total Marks:70****Instructions:**

1. Attempt all questions.
2. Make suitable assumptions wherever necessary.
3. Figures to the right indicate full marks.
4. Simple and non-programmable scientific calculators are allowed.

- Q.1** (a) What is the fundamental requirement of High Conducting materials? **03**
(b) What is Seeback effect? **04**
(c) State the properties and applications of Copper. **07**

- Q.2** (a) Give classification of Insulating material based on Substances and Materials with example. **03**
(b) Which is the different material used in making DC Machine? **04**
(c) Explain the different Electrical properties of Insulating Materials? **07**

OR

- (c) Enlist solid insulating materials in Electrical Machines and explain any two with its electrical and thermal characteristics. **07**

- Q.3** (a) What is Dielectric Strength of martial? Which factors affect the Dielectric Strength of material? **03**
(b) What is Hygroscopicity? **04**
(c) State and explain the properties of Magnetic Materials. **07**

OR

- Q.3** (a) What is Paramagnetic Material? **03**
(b) Draw and Explain BH curve of magnetic material. **04**
(c) Give and justify the choice of Magnetic Material for (1) Armature of DC machine, (2) Stator of AC machine, (3) Submarine Cable. **07**

- Q.4** (a) What is Intrinsic and Extrinsic semiconductors? **03**
(b) Explain conduction of current in N-type Semiconductor. **04**
(c) Explain the factors affecting the resistivity of Semiconductor. **07**

OR

- Q.4** (a) Give classification of Semiconductor. **03**
(b) Give comparison of Type I Superconductor and Type II Superconductor. **04**
(c) Discuss the High Frequency Materials. **07**

- Q.5** (a) What is Refractory Material? List out the various refractory materials. **03**
(b) What is the effect of impurities of Material? **04**
(c) Write short note on Galvanizing Material. **07**

OR

- Q.5** (a) What is Peltier Effect? **03**
(b) Explain Silicon superconductor material. **04**
(c) Write short note on Radioactive Material. **07**