Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–VI (NEW) EXAMINATION – SUMMER 2023

Subject Code:3160923 Date:10-07-2023

Subject Name:Electrical Materials

Time:10:30 AM TO 01:00 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.**

			Marks
Q.1	**(a)**	What are the factors on which selection of conductor material depends?	**03**
	(b)	Explain the difference between diamagnetic and paramagnetic materials.	**04**
	(c)	Explain factors affecting the resistivity of conducting materials.	**07**
Q.2	**(a)**	Why air is replaced by nitrogen as an insulating material in certain applications?	**03**
	(b)	Give classifications of Insulating materials	**04**
	(c)	Discuss the Thermal Properties of an insulating materials.	**07**
		OR	
	(c)	Explain factors affecting properties of Ceramic Materials.	**07**
Q.3	**(a)**	Give reason why cores of transformer are made of silicon steel laminations.	**03**
	(b)	Compare Soft and Hard magnetic materials.	**04**
	(c)	Explain properties and use of Hard Magnetic Materials.	**07**
		OR	
Q.3	**(a)**	Which are the applications of Soft Ferrites?	**03**
	(b)	Soft magnetic materials are always preferred for making temporary magnets, why?	**04**
	(c)	Write short note on Magnetic Hysteresis.	**07**
Q.4	**(a)**	Give classifications of Semiconductors.	**03**
	(b)	Explain how holes work as charge carriers.	**04**
	(c)	Discuss the various properties and applications of the following insulating materials. (1) Glass (2) Cotton (3) Teflon.	**07**
		OR	
Q.4	**(a)**	What do you mean by critical temperature in superconductivity?	**03**
	(b)	Give brief description and applications of (1) FET (2) SCR (3) PN Junction Diode.	**04**
	(c)	Compare type-I and type-II superconductors.	**07**
Q.5	**(a)**	Semiconductor has negative temperature co-efficient of resistance, why?	**03**
	(b)	Explain various properties of Nickel iron alloy.	**04**
	(c)	What is Galvanizing? Explain different methods of Galvanizing.	**07**
		OR	
Q.5	**(a)**	Which are the properties of High Frequency Materials?	**03**
	(b)	Explain the applications of Super conducting materials.	**04**
	(c)	What are Refractory Materials? Give applications of different types of Refractory Materials.	**07**