Enrolment No./Seat No_____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–VI EXAMINATION – SUMMER 2025

Subject Code: 3160923 Date: 26-05-2025

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 effect of temperature on semiconductor.	**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)	Discuss properties of high resistivity material.	**04**
	(c)	Explain difference between hard and soft magnetic material.	**07**
		OR	
	(c)	Discuss the thermal properties of an insulating materials.	**07**
Q.3	**(a)**	Give reason why cores of transformer are made of silicon steel laminations.	**03**
	(b)	What is a super conductor? Explain the applications of super conducting materials.	**04**
	(c)	Write short notes on: mechanical and electrical properties of dielectric materials.	**07**
		OR	
Q.3	**(a)**	Which are the applications of Soft Ferrites?	**03**
	(b)	Name four natural insulating materials. Mention their most important properties and their application.	**04**
	(c)	Write short note on magnetic hysteresis.	**07**
Q.4	**(a)**	What do you mean by critical temperature in superconductivity?	**03**
	(b)	Explain how holes work as charge carriers.	**04**
	(c)	Write short notes on Radioactive materials	**07**
		OR	
Q.4	**(a)**	Give classifications of semiconductors.	**03**
	(b)	Explain the difference between diamagnetic and paramagnetic materials.	**04**
	(c)	Compare type-I and type-II superconductors.	**07**
Q.5	**(a)**	Which are the properties of High Frequency Materials?	**03**
	(b)	Write short notes on Galvanizing materials.	**04**
	(c)	What are refractory materials? Give applications of different types of refractory materials.	**07**
		OR	
Q.5	**(a)**	Compare Copper and Aluminum conducting materials.	**03**
	(b)	Explain various properties of Nickel iron alloy.	**04**
	(c)	Write short notes on losses in magnetic materials.	**07**

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