Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER– VI (NEW) EXAMINATION – WINTER 2021

Subject Code:3160923 Date:30/11/2021

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)**	Compare Copper and Aluminum conducting material as	**03**
	(b)	Enlist factors affecting resistivity of material and discuss any one in brief	**04**
	(c)	Discuss properties of high resistivity material	**07**
Q.2	**(a)**	Give characteristic of good insulating material	**03**
	(b)	Discuss transformer oil as insulating material	**04**
	(c)	Enlist solid insulating materials in Electrical Machines and explain any two with its characteristics	**07**
		OR	
	(c)	Enlist gaseous insulating materials in Electrical Engineering and explain any two with its characteristics	**07**
Q.3	**(a)**	Discuss effect of moisture on insulating material	**03**
	(b)	Give brief note on amorphous material	**04**
	(c)	Explain difference between hard and soft magnetic material	**07**
		OR	
Q.3	**(a)**	Give classification of magnetic material and explain in brief	**03**
	(b)	Explain hysteresis and eddy current loss	**04**
	(c)	Give and Justify choice of magnetic material for (1)transformer core (2)Stator of DC (3) Submarine cable(3) core of CT and PT	**07**
Q.4	**(a)**	Explain effect of temperature on semiconductor	**03**
	(b)	Explain intrinsic and extrinsic semiconductors	**04**
	(c)	Give properties and application of following semiconductors (1) Germanium (2) Silicon (3) Silicon carbide	**07**
		OR	
Q.4	**(a)**	Explain P-type and N-type semiconductor material	**03**
	(b)	Explain effect of alloying on resistivity of material	**04**
	(c)	Classification of Insulating material based on temperature	**07**
Q.5	**(a)**	Enlist applications of semiconductor material	**03**
	(b)	Explain hard and soft ferrites	**04**
	(c)	Compare Type-I and Type-II superconductor	**07**
		OR	
Q.5	**(a)**	Discuss Nickel Iron alloys	**03**
	(b)	Brief note on structural and refractory material	**04**
	(c)	Properties of superconductor	**07**

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Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–VI (NEW) EXAMINATION – SUMMER 2022

Subject Code:3160923 Date:06/06/2022

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)**	Give classification of magnetic material and explain in brief.	**03**
	(b)	Explain effect of temperature on semiconductor.	**04**
	(c)	Compare Type-I and Type-II superconductor.	**07**
Q.2	**(a)**	What are the properties of good conductors?	**03**
	(b)	Discuss properties of high resistivity material.	**04**
	(c)	Explain difference between hard and soft magnetic material.	**07**
		OR	
	(c)	Properties of superconductor.	**07**
Q.3	**(a)**	Explain P-type and N-type semiconductor material.	**03**
	(b)	What is a super conductor? Explain the applications of super conducting materials.	**04**
	(c)	Write short notes on permanent magnet materials.	**07**
		OR	
Q.3	**(a)**	What is dielectric? Why it is used in capacitors?	**03**
	(b)	Name four natural insulating materials. Mention their most important properties and their application.	**04**
	(c)	Write short notes on: mechanical and electrical properties of dielectric materials.	**07**
Q.4	**(a)**	What are the various thermal properties of insulating materials?	**03**
	(b)	Explain the difference between diamagnetic and paramagnetic materials.	**04**
	(c)	Write short notes on Radioactive materials	**07**
		OR	
Q.4	**(a)**	Discuss transformer oil as insulating material.	**03**
	(b)	Explain the difference between hard and soft magnetic materials.	**04**
	(c)	Explain the factors affecting the change in resistivity of the semiconducting materials.	**07**
Q.5	**(a)**	Compare Copper and Aluminum conducting materials.	**03**
	(b)	Write short notes on Refractory materials.	**04**
	(c)	Write short notes on losses in magnetic materials.	**07**

OR

Q.5	**(a)**	What do you mean by critical temperature in super conductivity?	**03**
	(b)	Write short notes on Galvanizing materials.	**04**
	(c)	Explain intrinsic and extrinsic semiconductors.	**07**

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