

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

GUJARAT TECHNOLOGICAL UNIVERSITY**BE - SEMESTER-VI (NEW) EXAMINATION – SUMMER 2024****Subject Code:3160923****Date:20-05-2024****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 properties of good conductors?	03
(b) Compare copper and aluminum as conducting material.	04
(c) Discuss properties of high resistivity material	07
Q.2 (a) What is dielectric? Why it is used in capacitors?	03
(b) Why is CRGO steel used to make the core of transformer?	04
(c) Discuss the thermal properties of insulating materials.	07
OR	
(c) Explain the different electrical properties of insulating materials?	07
Q.3 (a) Give classification of insulating material based on substances and materials with example.	03
(b) Explain the difference between diamagnetic and paramagnetic materials.	04
(c) Write short note on magnetic hysteresis.	07
OR	
Q.3 (a) What is dielectric strength of material? Which factors affect the dielectric strength of material?	03
(b) Explain the difference between hard and soft magnetic materials.	04
(c) Write short notes on permanent magnet materials.	07
Q.4 (a) What is Peltier effect?	03
(b) Give brief description and applications of (1) PN junction diode (2) Silicon controlled rectifier	04
(c) Discuss properties of superconductors.	07
OR	
Q.4 (a) What is Seebeck effect?	03
(b) Explain the applications of superconducting materials.	04
(c) Compare Type-I and Type-II superconductor.	07
Q.5 (a) What do you mean by critical temperature in super conductivity?	03
(b) List and describe the properties of high-frequency materials.	04
(c) Write short notes on refractory materials.	07

OR

- Q.5** (a) What is radioactive material? List out at least two radioactive materials. **03**
(b) List out the materials used in making a DC machine and briefly explain their roles **04**
(c) Explain different methods of Galvanizing. **07**

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

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**
