

**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**

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

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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
<b>Q.1</b> (a) Give classification of magnetic material and explain in brief.	<b>03</b>
(b) Explain effect of temperature on semiconductor.	<b>04</b>
(c) Compare Type-I and Type-II superconductor.	<b>07</b>
<b>Q.2</b> (a) What are the properties of good conductors?	<b>03</b>
(b) Discuss properties of high resistivity material.	<b>04</b>
(c) Explain difference between hard and soft magnetic material.	<b>07</b>
<b>OR</b>	
(c) Properties of superconductor.	<b>07</b>
<b>Q.3</b> (a) Explain P-type and N-type semiconductor material.	<b>03</b>
(b) What is a super conductor? Explain the applications of super conducting materials.	<b>04</b>
(c) Write short notes on permanent magnet materials.	<b>07</b>
<b>OR</b>	
<b>Q.3</b> (a) What is dielectric? Why it is used in capacitors?	<b>03</b>
(b) Name four natural insulating materials. Mention their most important properties and their application.	<b>04</b>
(c) Write short notes on: mechanical and electrical properties of dielectric materials.	<b>07</b>
<b>Q.4</b> (a) What are the various thermal properties of insulating materials?	<b>03</b>
(b) Explain the difference between diamagnetic and paramagnetic materials.	<b>04</b>
(c) Write short notes on Radioactive materials	<b>07</b>
<b>OR</b>	
<b>Q.4</b> (a) Discuss transformer oil as insulating material.	<b>03</b>
(b) Explain the difference between hard and soft magnetic materials.	<b>04</b>
(c) Explain the factors affecting the change in resistivity of the semiconducting materials.	<b>07</b>
<b>Q.5</b> (a) Compare Copper and Aluminum conducting materials.	<b>03</b>
(b) Write short notes on Refractory materials.	<b>04</b>
(c) Write short notes on losses in magnetic materials.	<b>07</b>

**OR**

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

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