



InSem Examination-IWinter 2023		
Exam Seat No.:		
Academic Year:2023-2024	Semester: III	
Name of Programme:B.Tech Electrical Engineering	Pattern:2022	
Name of Course:Electrical Engineering Materials	Course Code:ELE222004	
Max. Marks: 30	Duration: 01:00hr	

<p><b>Instructions:</b> Candidates should read carefully the instructions printed on the Question Paper and on the cover page of the Answer Book, which is provided for their use.</p> <ol style="list-style-type: none"><li>1. This question paper contains _____page(s).</li><li>2. Answer to each new question is to be started on a new page.</li><li>3. Assume suitable data wherever required, but justify it.</li><li>4. Draw the neat labelled diagrams, wherever necessary.</li><li>5. The last columns indicates the Course Outcome and level of Blooms Taxonomy of the Question/sub-question</li></ol>	
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**Question No. 1 Attempt following Question**

- a) Define Insulating Materials and Conducting materials with suitable examples. (4) CO1

**OR**

- b) Discuss various levels of material structure. (4) CO1
- c) Explain in detail the operational requirement of electrical materials. (5) CO2

**OR**

- d) Explain in detail Thermoplastics (5) CO2
- e) Discuss Ferromagnetic semiconductors (6) CO2

**OR**

- f) Discuss thermosets with suitable examples. (6) CO2

**Question No. 2 Attempt following Question**

a) Discuss dielectric loss with suitable phasor diagram. (4) CO1

**OR**

b) State and define any two parameters of dielectric material. (4) CO1

c) Describe piezoelectric materials behavior stating their applications. (5) CO3

**OR**

d) Describe electronic polarization with suitable diagram. (5) CO3

e) A parallel plate has capacitance of 5micro farad. The dielectric has permittivity as 100, for applied voltage of 2000V. Find (6) CO2

1) energy stored in capacitor

2) The energy stored in polarising the dielectric.

**OR**

f) Calculate electronic polarizability of argon atom if relative permittivity is 1.0024 at NTP and  $N=2.8 \times 10^{25}$  atoms per meter cube. (6) CO2