

Reg No.: \_\_\_\_\_

Name: \_\_\_\_\_

**APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY**  
FOURTH SEMESTER B.TECH DEGREE EXAMINATION(R&S), MAY 2019

**Course Code: EE206**

**Course Name: MATERIAL SCIENCE (EE)**

Max. Marks: 100

Duration: 3 Hours

**PART A**

*Answer all questions, each carries 5 marks*

- 1 Define polarization and what are different polarization processes? (5)
- 2 Explain the properties of Mica and Ceramics. (5)
- 3 List any five characteristics of SF<sub>6</sub>. (5)
- 4 Explain Curie Wiess law. (5)
- 5 Explain superconductivity and its applications. (5)
- 6 What are the materials used for solar cells? Explain. (5)
- 7 Write short notes on bio materials. (5)
- 8 What is photoelectron spectroscopy? Explain. (5)

**PART B**

*Answer any two questions, each carries 10 marks*

- 9 a) Derive Claussius-mosotti relation. (5)  
b) What are compound semiconductors? (5)
- 10 a) Differentiate organic and inorganic insulators. (4)  
b) Why SF<sub>6</sub> gas is used in circuit breakers? (3)  
c) What are the insulating materials used in capacitor materials? (3)
- 11 a) Explain different types of polarizations in dielectrics. (6)  
b) What do you mean by insulating materials? Explain its classification based on temperature. (4)

**PART C**

*Answer any two questions, each carries 10 marks*

- 12 a) Explain streamer theory of breakdown in gases. (6)  
b) Define suspended particle theory. (4)
- 13 a) Explain properties and applications of iron. (6)  
b) Explain the applications of magnetic materials in electrical machines. (4)
- 14 a) How breakdown occur in vacuum insulators? Explain any one mechanism. (6)

- b) Explain transformer oil treatment method. (4)

**PART D**

*Answer any two questions, each carries 10 marks*

- 15 Explain
1. Antireflection coating
  2. Solar selective coating (10)
  3. Cold mirror coating
- 16 a) Explain atomic absorption spectroscopy. (5)
- b) Explain the different characteristic properties of superconductors. (5)
- 17 Explain different types of electron microscopy and their applications. (10)

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