

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

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

**APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY**  
**FOURTH SEMESTER B.TECH DEGREE EXAMINATION, JULY 2017**

**Course Code: EE206**

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

Max. Marks: 100

Duration: 3 Hours

**PART A**

*Answer all questions. Each carries 5 marks.*

- 1 What is meant by electrical and thermal conductivity of metals. (5)
- 2 What is ferroelectricity. Give at least two examples. (5)
- 3 What are the Townsend's criterion for spark? (5)
- 4 Why the magnetisation lost, when the ferromagnetic materials are heated above a certain temperature. (5)
- 5 List the merits and demerits of solar cells. (5)
- 6 Discuss between solar cell and a solar panel. (5)
- 7 What are the applications of optical microscope. (5)
- 8 Write short notes on biomaterials. (5)

**PART B**

*Answer any two questions. Each carries 10 marks.*

- 9 What is meant by polarization in a dielectric. Explain how the variation of dielectric constant with frequency. (10)
- 10 Describe the application of various insulating materials used in the following power apparatus: - (10)
 

i) Power transformer	ii) Circuit breaker
iii) Power	iv) Rotating machines
- 11 a) What is Dielectric constant. (2)
- b) Explain dielectric loss and loss tangent with the help of a phasor diagram. (6)
- c) Mention the factors, which affect the dielectric loss of an insulating material. (2)

**PART C**

*Answer any two questions. Each carries 10 marks.*

- 12 a) Explain Townsend's first and second ionisation coefficient. (10)
- 13 a) Discuss the application of magnetic materials used in electrical machines, instruments and relays. Justify with reasons. (10)
- 14 a) Explain the suspended particle mechanism in dielectric breakdown. (7)
- b) what is intrinsic breakdown? (3)

**PART D**

*Answer any two questions. Each carries 10 marks.*

- 15 a) Explain the mechanism of electricity production in solar cells with construction? (10)
- 16 a) What are the different types of electron microscopy. Explain each of them? (10)
- 17 a) List the factors which affect the characteristic properties of superconductor. Also discuss at least two applications of superconductors. (10)

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