

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

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

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

**Course Code: EE206**

**Course Name: MATERIAL SCIENCE**

Max. Marks: 100

Duration: 3 Hours

**PART A**

*Answer all questions, each carries 5 marks*

Mark

- |   |  |     |
|---|--|-----|
| 1 | Explain how the conductivity of conducting materials vary with temperature and composition | (5) |
| 2 | What do you mean by ferroelectricity? Name any two ferroelectric materials.                | (5) |
| 3 | What are the factors influencing ageing of insulators?                                     | (5) |
| 4 | Differentiate between soft and hard magnetic materials.                                    | (5) |
| 5 | What are the materials used for the solar cell?  | (5) |
| 6 | Why solar selective coating is used in solar system?                                       | (5) |
| 7 | What do you mean by optical microscopy? Explain with diagram.                              | (5) |
| 8 | How the nanomaterials are classified?  | (5) |

**PART B**

*Answer any two questions, each carries 10 marks*

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|----|---|-----|
| 9  | a) Explain the behaviour of dielectrics in alternating field.                   | (7) |
|    | b) Name any three alloys of copper and explain its composition.                 | (3) |
| 10 | a) Explain physical and chemical properties of SF <sub>6</sub> .                | (6) |
|    | b) What are the polymeric organic materials used in electrical apparatus?       | (4) |
| 11 | a) Why SF <sub>6</sub> gas is mixing with nitrogen for industrial applications? | (4) |
|    | b) What are the materials used for solders and contacts?                        | (6) |

**PART C**

*Answer any two questions, each carries 10 marks*

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|----|---|-----|
| 12 | a) Explain the mechanism of breakdown in gases dielectrics                    | (7) |
|    | b) Why transformer oil testing is so important?                               | (3) |
| 13 | a) Explain the classification of magnetic material based on magnetic dipoles. | (6) |
|    | b) What is ferrites? Explain its properties                                   | (4) |
| 14 | a) Derive the Townsends current growth equation for primary ionization.       | (5) |
|    | b) Write five applications of iron alloys.                                    | (5) |

**PART D**

*Answer any two questions, each carries 10 marks*

- 15 a) Explain the Photo-thermal solar energy conversion with figure. (6)  
b) What are the main applications of superconducting materials? (4)
- 16 a) Draw and explain the schematics of Atomic Absorption Spectroscopy (10)
- 17 a) What are the organic solar cells? Explain its advantages. (6)  
b) Write short notes on importance of biomaterials. (4)

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