

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

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|---|--------------------------------------------------------------------------------------------|-----|
| 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 ₆ . | (6) |
| | b) What are the polymeric organic materials used in electrical apparatus? | (4) |
| 11 | a) Why SF ₆ 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)
