

Reg No.: _____

Name: _____

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY
FOURTH SEMESTER B.TECH DEGREE EXAMINATION, APRIL 2018

Course Code: EE206

Course Name: MATERIAL SCIENCE (EE)

Max. Marks: 100

Duration: 3 Hours

PART A

Answer all questions, each carries 5 marks

Marks

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|---|--|-----|
| 1 | What is electrical conductivity? Obtain the expression for electrical conductivity of a metal. | (5) |
| 2 | Explain the properties SF ₆ gas as an insulator. | (5) |
| 3 | List the factors which affect ageing of insulator. | (5) |
| 4 | Write short notes on ferrites. | (5) |
| 5 | What is superconductivity? Give the applications of superconductor. | (5) |
| 6 | What are the classifications of solar cell? Explain. | (5) |
| 7 | What is optical microscopy? | (5) |
| 8 | What are the limitations of optical microscopy? Give one merit of scanning electron microscopy compared to optical microscopy. | (5) |

PART B

Answer any two questions, each carries 10 marks

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|----|---|------|
| 9 | Explain Clausis Mosotti relation. | (10) |
| 10 | Describe the applications of following insulating materials used in electrical apparatus:
i) Liquid insulator ii) Gaseous insulators
iii) Organic insulator iv) Inorganic insulator | (10) |
| 11 | Distinguish between electronic an ionic polarization. How do they depend on frequency? | (10) |

PART C

Answer any two questions, each carries 10 marks

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|----|---|------------|
| 12 | Explain streamer mechanism of spark. | (10) |
| 13 | Explain the classification of magnetic materials with example. | (10) |
| 14 | a) Explain the properties and application of alloys of iron.
b) What are the application of vacuum insulation. | (7)
(3) |

PART D

Answer any two questions, each carries 10 marks

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|----|--|-------------------|
| 15 | a) What is Type-I and Type-II superconductors?
b) What is atomic absorption spectroscopy? | (6)
(4) |
| 16 | Explain the construction and working of organic solar cell. | (10) |
| 17 | a) What is biocompatibility?
b) What are the properties of nanotubes?
c) What is photoelectron spectroscopy? | (2)
(3)
(5) |
