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| **Scheme of Valuation/Answer Key** | | | | | |
| **APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY**  FOURTH SEMESTER B.TECH DEGREE EXAMINATION, JUNE 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 |  | Polarization definition (2 marks)  Name 3 polarization processes (3 x 1=3 marks) | | | 5 |
| 2 |  | List any 5 properties of mica (5 x ½ = 2 ½ marks)  List any 5 properties of ceramics (5 x ½ = 2 ½ marks) | | | 5 |
| 3 |  | List any 5 characteristics of SF6 (5 x 1 = 5 marks) | | | 5 |
| 4 |  | Curie Wiess law definition and curie temperature explanation (5 marks) | | | 5 |
| 5 |  | * Definition of super conductivity (2 marks) * Any 3 applications (3 x 1=3 marks) | | | 5 |
| 6 |  | List any 4 solar cell materials with explanation (5 marks) | | | 5 |
| 7 |  | Definition of biomaterial (2 marks)  Different biomaterials and explanation (3 marks) | | | 5 |
| 8 |  | Block diagram (2 marks)  Explanation (3 marks) | | | 5 |
| **PART B** | | | | | |
| ***Answer any two questions, each carries 10 marks*** | | | | | |
| 9 | a) | Derivation of Claussius-mosotti relation (5 marks)  (Partial derivation= 3 marks) | | | 5 |
|  | b) | Compound semiconductor definition (3 marks)  Examples (2 marks) | | | 5 |
| 10 | a) | List any 4 differences between organic & inorganic insulators (4 x 1 = 4 marks) | | | 4 |
|  | b) | Reason for use of SF6 in CB (3 marks) | | | 3 |
|  | c) | List the insulating materials in capacitors with explanation (3 marks) | | | 3 |
| 11 | a) | Electronic polarization – explanation (2 marks)  Ionic polarization – explanation (2 marks)  Dipolar polarization – explanation (2 marks) | | | 6 |
|  | b) | Insulating materials definition (1 mark)  Insulating materials example (1 mark)  Classification based on temperature (Class A,B,F,H,N) (2 marks) | | | 4 |
| **PART C** | | | | | |
| ***Answer any two questions, each carries 10 marks*** | | | | | |
| 12 | a) | Breakdown in gases (1 marks)  Streamer theory - explanation (3 marks)  Figures (2 marks | | | 6 |
|  | b) | Definition and explanation – suspended particle theory (4 marks) | | | 4 |
| 13 | a) | List any 4 properties of iron (3 marks)  List any 4 applications. (3 marks) | | | 6 |
|  | b) | List any 4 applications (4 x 1=4 marks) | | | 4 |
| 14 | a) | Breakdown process in vacuum insulators (explanation) (3 marks)  Any one breakdown mechanism (explanation) (3 marks) | | | 6 |
|  | b) | Transformer oil treatment definition (2 marks)  List any 4 methods or detailed explanation of any one method (2marks) | | | 4 |
| **PART D** | | | | | |
| ***Answer any two questions, each carries 10 marks*** | | | | | |
| 15 |  | Antireflection coating - explanation (3 marks)  Solar selective coating - explanation (3 marks)  Cold mirror coating - explanation (3 marks)  Importance of coating (1 mark) | | | 10 |
| 16 | a) | Atomic absorption spectroscopy figure (2 marks)  Atomic absorption spectroscopy explanation (3 marks) | | | 5 |
|  | b) | List and explain any five properties, 1 mark each (5 marks) | | | 5 |
| 17 |  | Electron microscopy definition (1 mark)  Scanning electron microscopy - explanation with diagram (3 marks)  Transmission electron microscopy - explanation with diagram (3 marks)  Scanning transmission electron microscope - explanation only (1 mark)  Any 4 applications (4 x ½ marks) (2 marks) | | | 10 |
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