

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

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

**APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY**

FOURTH SEMESTER B.TECH DEGREE EXAMINATION, DECEMBER 2018

**Course Code: EE206****Course Name: MATERIAL SCIENCE**

Max. Marks:100

Duration: 3 Hours

**PART A***Answer all questions.*

1. How the dielectrics are thermally classified? (5)
2. What are compound semi conductors ? specify examples with application (5)
3. Explain Townsend criteria for breakdown of gaseous dielectrics (5)
4. Derive Curie- Weiss law for magnetic materials. Explain ferromagnetism (5)
5. What is carbon nano tube? Give its application (5)
6. Define super conductivity. What are the applications of superconductive materials in electrical engineering (5)
7. What are the classification of solar cells based on their technology? (5)
8. Write note on atomic absorption spectrography (5)

**PART B***Answer any 2 questions*

9. (a). What is meant by mobility, mean freepath, and relaxation time in conduction Phenomenon? (6)
- (b).Why carbon is used as brush in electrical machines? (4)
10. (a) Explain the difference in conduction properties of conductors, semiconductors and insulators on the basis of energy band diagram? (6)

- (b) What are ferrites? Give two applications of Ferrites. (4)
11. (a) What are the properties of SF<sub>6</sub> gas as a dielectric material? Give one example.  
What is the effect when it is mixed with N<sub>2</sub>? (6)
- (b) Write a note on common insulating materials with their applications? (4)

### PART C

*Answer any 2 questions*

12. What are the mechanisms of breakdown in solid dielectrics? (10)
13. Explain the method of processing of Transformer oil? (10)
14. (a) Enumerate the magnetic materials used in electrical machines and relays? (6)
- (b) What is meant by spontaneous magnetization? Give examples of materials exhibiting this property. (4)

### PART D

*Answer any 2 questions*

15. a) Explain the difference between Type I and Type II superconductors on the basis of Messner effect? (6)
- b) What are the materials used for making thin film solar cells? Give applications of thin film solar cells. (4)
16. a) Explain photo voltaic conversion. What are the advantages of solar power? (6)
- b) Compare and contrast photo thermal conversion and photo voltaic conversion. (4)
17. Explain various techniques used for materials study. (10)

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