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**UNIVERSITY**

(Karunya Institute of Technology & Sciences)

(Declared as Deemed-to-be University under Sec.3 of the UGC Act, 1956)

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

**End Semester Examination – Nov/Dec - 2016**

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|  |  | **Semester :** | **2016-17 ODD** |
| **Code :** | **12EE231/EE276** | **Duration :** | **3 hrs** |
| **Sub. Name :** | **MATERIAL SCIENCE** | **Max. marks :** | **100** |

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| **Q. No.** | **Questions** | **Marks** |
| **PART-A(10X1=10 MARKS)** | | |
| 1. | \_\_\_\_\_\_\_\_\_\_ is the simplest repeating unit in a crystal. | (1) |
| 2. | The crystal system with all sides equal and all the interfacial angles equal to 90o is \_\_\_\_\_\_\_\_\_\_. | (1) |
| 3. | The elemental semiconductors are made from \_\_\_\_\_\_\_\_\_\_ column elements of the periodic table. | (1) |
| 4. | A semiconductor in an extremely pure form is called as \_\_\_\_\_\_\_\_\_\_ semiconductors. | (1) |
| 5. | Which type of polarization arises due to the displacement of cations and anions from its original position in opposite direction, in presence of electric field? | (1) |
| 6. | When a dielectric is subjected to an electric field, the energy loss in terms of heat is called \_\_\_\_\_\_\_\_\_\_. | (1) |
| 7. | The materials with no permanent magnetic moment give rise to \_\_\_\_\_\_\_\_\_\_ type of magnetism? | (1) |
| 8. | Soft magnets are used in transformers. True or False. | (1) |
| 9. | What is a nanomaterial? | (1) |
| 10. | The materials which conduct the electricity with zero resistance are called \_\_\_\_\_\_\_\_\_\_. | (1) |

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| **PART B(5 X 3= 15 MARKS)** | | | | | | |
| 11. | Distinguish single and polycrystalline materials. | | | | | (3) |
| 12. | What are extrinsic semiconductors? | | | | | (3) |
| 13. | What are the types of polarizations? | | | | | (3) |
| 14. | What happens to ferri and ferro magnetic materials above curie temperature? | | | | | (3) |
| 15. | What are shape memory alloys? | | | | | (3) |
| **PART C(5 X 15= 75 MARKS)** | | | | | | |
| 16. | | a. | What are seven crystal systems? | | 3 | |
| b. | With a neat sketch describe the seven crystal systems and 14 Bravais Lattices | | 12 | |
| (OR) | | | | | | |
| 17. | | a. | Explain the different types of point defects with a neat sketch. | | 8 | |
| b. | Explain line, surface and volume imperfections with a neat sketch. | | 7 | |
| 18. | |  | What is Zone refining. How it is used to produce pure semiconductor materials. | | 15 | |
| (OR) | | | | | | |
| 19. | |  | What is Hall Effect? Explain the experimental detail of hall effect for an n-type semiconductor. | | 15 | |
| 20. | | a. | What are Ferroelectric materials? Explain the properties. | | 8 | |
| b. | Explain Ferroelectricity in BaTiO3 | | 7 | |
| (OR) | | | | | | |
| 21. | |  | Explain the (a) Electronic (b) Ionic and (c) Orientation polarization mechanisms in Dielectrics. | | 15 | |
| 22. | |  | With a neat sketch explain the Heisenbergs Domain theory of Ferromagnetism. | | 15 | |
| (OR) | | | | | | |
| 23. | | a. | What is hysteresis? | | 3 | |
| b. | Explain the Hysteresis loop with a neat sketch to classify hard and soft magnets. | | 12 | |
| 24. | | a. | Discuss the (i) Plasma Arching and (ii) Electrodeposition methods of producing Nanomaterials in detail. | | 8 | |
| b. | Write a note on properties of Nanomaterials and their applications. | | 7 | |
| (OR) | | | | | | |
| 25. | | a. | Give a detailed note on Type I and Type II superconductors. | | 10 | |
| b. | | Write a note on Engineering applications of superconductors. | 5 | |

ALL THE BEST