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C16-EE-105**6039****BOARD DIPLOMA EXAMINATION, (C-16)****OCTOBER/NOVEMBER—2023****DEEE - FIRST YEAR EXAMINATION****ELECTRICAL ENGINEERING MATERIALS***Time : 3 Hours]**[Total Marks : 80***PART—A****3×10=30**

- Instructions :** (1) Answer **all** questions.
(2) Each question carries **three** marks.
(3) Answers should be brief and straight to the point and shall not exceed five simple sentences.

1. List the properties of conducting materials.
2. List the colour codes adopted for resistors with tolerance value.
3. Compare intrinsic semiconductors and extrinsic semiconductors.
4. Define volume resistance, surface resistance and insulation resistance.
5. List the properties and applications of Mica.
6. List the permittivity of air, bakelite, glass and paper.
7. Define the Eddy current losses.
8. State the importance of nano materials.
9. Distinguish between primary cells and secondary cells.
10. List the application of Nickel-Iron cell.

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PART—B

10×5=50

- Instructions :** (1) Answer *any five* questions.
(2) Each question carries **ten** marks.
(3) Answers should be comprehensive and criterion for valuation is the content but not the length of the answer.

11. (a) State the requirements of low resistivity materials and high resistivity materials.

(b) List the properties and applications of copper.

12. (a) List the properties and applications of AAAC and ACSR.

(b) State the applications and properties of mercury and carbon.

13. (a) Explain the formation of N-type semiconductors.

(b) Explain the process of polarization in dielectric material.

14. Draw and explain the energy level diagrams of conductors, insulators and semiconductors.

15. Classify the various magnetic materials on basis of dipole orientation and explain each of the magnetic material.

16. Explain the thermocouple materials and give any two examples of thermocouple materials.

* **17.** A secondary cell having 20 hours charge rate at 15 ampere current and delivers 6 ampere for 40 hours with a mean terminal voltage of 2 Volt. The terminal voltage during charging has a mean value of 2.3 Volt. Calculate (a) ampere hour efficiency and (b) watt hour efficiency.

18. Compare lead-acid cell with Nickel-Iron cell.

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