



C-14-EE-105

4045

BOARD DIPLOMA EXAMINATION, (C-14)

APRIL/MAY—2015

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 requirements of high resistivity materials. 3
2. State the applications of carbon and nichrome. $1\frac{1}{2}+1\frac{1}{2}$
3. Define semiconducting materials with examples. 3
4. State the applications of nitrogen and hydrogen. $1\frac{1}{2}+1\frac{1}{2}$
5. What are the factors affecting dielectric loss? 3
6. Define magnetostriction. 3
7. List the characteristics of fuse element material. 3
8. Write the advantages of enamel-coated copper wires. 3
9. What is trickle charging of batteries? 3
10. State the factors affecting capacity of a battery. 3

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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 the criterion for valuation is the content but not the length of the answer.

- 11.** (a) Write the effects of hardening and annealing on copper. 5
(b) State the properties of copper. 5
- 12.** (a) State the properties and applications of mercury. 5
(b) State the properties of ACSR conductor and mention its applications. 5
- 13.** (a) Explain the formation of N-type semiconductors with neat sketch. 5
(b) Distinguish between P-type and N-type semiconductors in any five aspects. 5
- 14.** (a) State the properties and applications of sulphur hexafluoride (SF₆). 5
(b) Briefly explain the materials added to PVC to improve its properties and mention its application. 5
- 15.** (a) Explain polarization with a neat sketch. 5
(b) Define and explain the process of impregnation with a neat sketch. 5
- 16.** (a) Classify magnetic materials with examples and explain them. 5
(b) Briefly explain about eddy current loss. 5
- 17.** (a) Explain the charging of battery by constant voltage method with a neat sketch. 5
(b) Write any six differences between lead-acid batteries and maintenance-free batteries. 5
- 18.** (a) Define ampere-hour efficiency and watt-hour efficiency. 5
(b) Determine ampere-hour and watt-hour efficiencies of an accumulator which is charged for 12 hours at 25 A at an average voltage of 2.5 V and discharged in 10 hours at a load of 20 A at an average voltage of 2.25 V. 5

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