



C14-EE-105

**4045**

**BOARD DIPLOMA EXAMINATION, (C-14)**

**OCT/NOV—2017**

**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 low resistivity materials.
2. Give the composition of manganin and constantan.
3. What number of valence electrons in the valance band makes (a) the best conductor and (b) the best insulator?
4. Define insulation resistance and surface resistance.
5. Define the terms 'dielectric strength' and 'dielectric loss'.
6. Define the terms 'Curie point' and 'magnetostriction'.
7. List or classify the special purpose of materials.
8. What are the characteristics of fuse element material?
9. List the indications of a fully charged cell.
10. What are the factors affecting the capacity of a battery?

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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) State the properties and applications of aluminium. 5  
(b) State the properties and applications of platinum. 5
- 12.** (a) Explain the effect of annealing and hardening on copper regarding electrical and mechanical properties. 5  
(b) State the properties and applications of ACSR conductors. 5
- 13.** (a) Distinguish between intrinsic and extrinsic semiconductors in any five aspects. 5  
(b) Explain the formation of *N*-type semiconductors with neat sketch. 5
- 14.** (a) Classify the insulating materials based on its operating temperature. 5  
(b) State the properties and applications of hydrogen. 5
- 15.** (a) Explain dielectric loss. 5  
(b) Explain the process of galvanization with a neat sketch. 5
- 16.** (a) Briefly explain about eddy current loss. 5  
(b) Explain hysteresis curve with a neat sketch. 5
- 17.** (a) Describe the charging and discharging of nickel-iron cell. 5  
(b) Explain charging of battery by constant voltage method with a neat sketch. 5
- 18.** (a) Explain the construction and working of maintenance-free battery. 5  
(b) A lead-acid battery is discharged at a steady current of 22 A for 10 hours, at an average voltage of 1.8 V. If the battery is charged at a steady current of 36 A for 8 hours at an average voltage of 2.1 volts, calculate ampere-hour and watt-hour efficiencies. 5

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