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C20-EE-105

**7039**

**BOARD DIPLOMA EXAMINATION, (C-20)  
JUNE/JULY—2022**

**DEEE - FIRST YEAR EXAMINATION**

**ELECTRICAL ENGINEERING MATERIALS**

Time : 3 hours ]

[ Total Marks : 80

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**PART—A**

- 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. Define the term hardening. 3
2. State any three applications of ACSR conductors. 3
3. State any three factors affecting the insulation resistance. 3
4. State the permittivity values of the following : 1+1+1
  - (a) Air
  - (b) Mica
  - (c) Transformer oil
5. State any three applications of dielectrics. 3
6. Define the term magnetostriction in magnetic materials. 3
7. Draw the B-H loop of magnetic material and specify its features. 3
8. State any three uses of enamel coated copper wires. 3

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9. State any three applications of maintenance free batteries. 3
10. Distinguish primary and secondary cells in three aspects. 3

### PART—B

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

11. (a) State the properties and applications of copper. 8

**(OR)**

- (b) State the properties and applications of nichrome. 8

12. (a) Explain the formation of P-type semiconductor with a neat sketch. 8

**(OR)**

- (b) Define semi-conducting materials and compare intrinsic and extrinsic semiconducting materials. 2+6

13. (a) Classify the insulating materials on the basis of temperature with examples. 8

**(OR)**

- (b) State the properties and applications of sulphur-hexafluoride (SF<sub>6</sub>) as insulating material. 8

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14. (a) Explain the process of galvanizing and impregnation. 4+4

**(OR)**

- (b) State and explain about the bi-metal. 8

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15. (a) Explain construction details of lead-acid battery. 8

(OR)

- (b) A lead-acid battery is discharged at a steady current of 22 A for 10 hours and at an average voltage of 1.8 volts. 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. 4+4

**PART—C**

10×1=10

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

16. Explain the effects of the following on PVC :

- (a) Fillers  
(b) Stabilizers  
(c) Plasticizers  
(d) Additives

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