C16-EE–105

6039

BOARD DIPLOMA EXAMINATION, (C-16)

MARCH/APRIL—2021

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. State any three applications of mercury in the field of electrical engineering.

2. Write a short note on AAAC.

3. Draw a neat diagram of covalent bond of *P*-type semiconductor.

4. State any three electrical properties of insulating materials.

5. List any three applications of PVC in the field of electrical engineering.

6. Define dielectric strength and mention its units.

7. Compare soft magnetic materials with hard magnetic materials in any three aspects.

8. Write the names of any six materials used as fuse elements.

9. Compare primary cells with secondary cells in any three aspects.

10. Write a short note on Trickle charging.

PART—B

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. State any three properties and two applications of the following conducting materials :

(a) Copper

(b) Aluminium 5+5

12. *(a)* Write a short note on high resistivity materials. 5

(b) State the properties and applications of nichrome. 5

13. *(a)* Distinguish between *P*-type and *N*-type semiconductors in any five aspects. 5

(b) What is meant by polarization in dielectric materials? Explain briefly. 5

14. State any three properties and two applications of the following insulating materials :

(a) Mica

(b) Glass 5+5

15. Explain hysteresis loop in magnetic materials with a neat sketch. 10

16. Explain briefly the following terms :

(a) Thermocouple

(b) Bimetals 5+5

17. Explain the chemical reactions during charging and discharging of lead acid battery with neat sketches. 10

18. *(a)* Explain the charging of a battery by constant current method with a neat sketch. 5

(b) Calculate the ampere-hour and watt-hour efficiencies for a battery which is charged for 8 hours at 30 A at an average voltage of 1·2 V and discharged in 9 hours at a load of 24 A at an average voltage of 1·1 V. 5

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