C14–EE–105

4045

BOARD DIPLOMA EXAMINATION, (C–14)
SEPTEMBER/OCTOBER - 2020
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. Define :

(a) Harding

(b) Annealing

2. State the properties of constantan.

3. Define :

(a) P-type semiconductor

(b) N-type semiconductor

4. Define :

(a) Volume resistance

(b) Surface resistance

5. Define dielectric strength.

6. List the materials used for permanent magnets.

7. State the properties required for the fuse material.

8. State the uses of soldering materials.

9. List the parts of lead-acid battery.

10. State the application of maintenance-free battery.

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. Write the properties and applications of copper and aluminum.   10

12. List the properties and applications of the following high-resistance materials :

(a) Mercury   5

(b) Carbon   5

13. (a) Explain the formation of *N*-type semiconductors.   5

(b) Distinguish between intrinsic and extrinsic semiconductors.   5

14. Explain the energy-level diagrams of conductors, insulators and semiconductors.   10

15. (a) Derive the formula for dielectric loss.   5

(b) Explain the color coding of resistors.   5

16. Explain the difference between paramagnetic materials and diamagnetic materials with examples. 10

17. Explain the construction and working of nickel-iron cell. 10

18. Find ampere-hour and watt-hour efficiency of a battery when it is charged with 36A for 8 hours at a potential difference of 2·1 V and discharged at 22A for 10 hours at a potential difference of 1·8 V. 10

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