



C16-EE-105

6039

BOARD DIPLOMA EXAMINATION, (C-16)

MARCH/APRIL—2018

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 conducting materials and give two examples. 2+1=3
2. State any three properties of mercury. 1+1+1=3
3. Define intrinsic and extrinsic semiconductors. 3
4. State the properties of an insulating material. 3
5. Mention any three properties of impregnated paper. 3
6. State the permittivity of (i) air, (ii) mica and (iii) transformer oil. 3
7. Define magnetostriction in magnetic materials. 3
8. State the different types of materials used for fuse. 3
9. Distinguish between primary and secondary cells in three aspects. 3
10. State any three applications of nickel-iron cell. 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) State the requirements of low-resistivity materials. 5
(b) State any five applications of copper. 5
12. List any five properties of (i) nichrome and (ii) tungsten. 5+5=10
13. (a) Explain the formation of *N*-type semiconductors in detail. 5
(b) Explain colour coding of capacitor with an example. 5
14. Explain the effect of (a) fillers, (b) stabilizers and (c) additives and (d) plasticizers on PVC. $2\frac{1}{2}+2\frac{1}{2}+2\frac{1}{2}+2\frac{1}{2}=10$
15. (a) Explain hysteresis loop with neat sketch. 5
(b) State any five properties of soft magnetic materials. 5
16. (a) Define (i) rated current and (ii) fusing current. 2+2=4
(b) State the applications of enamel coated copper wires. 6
17. Explain the chemical reactions during charging and discharging of lead-acid battery. 10
18. (a) Explain the construction and working of silver oxide type button cell. 5
(b) A lead-acid battery is discharged at a steady current of 22 Amp for 10 hours, at an average voltage of 1.8 Volts. If the battery is charged at a steady current of 36 Amp for 8 hours at an average Voltage of 2.1 Voltes, calculate Ampre-hour and Watt-hour efficiencies. 5

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