C14–AEI–**106**

4048

BOARD DIPLOMA EXAMINATION, (C–14)
OCT/NOV—2015
DAEIE—FIRST YEAR EXAMINATION

BASIC ELECTRICAL ENGINEERING

Time : 3 hours] [*Total Marks* : 80

PART—A 3×10=30

Instructions : (1) Answer **all** questions.

(2) Each question carries **three** marks.

1. State Ohm's law.

2. Define specific resistance and mention its SI unit.

3. List the SI units of work, power and energy.

4. List any three electrical appliances in which heat is produced due to flow of electric current.

5. State right hand thumb rule.

6. State magnetic leakage coefficient.

7. State Faraday's law of electromagnetic induction.

8. State Fleming's right hand rule.

9. State Gauss theorem.

10. List any three applications of maintenance-free batteries.

Instructions : (1) Answer *any* **five** questions.

(2) Each question carries **ten** marks.

11. *(a)* Explain the temperature coefficient of resistance. 5

(b) A copper coil has a resistance of 20 at 0 ºC. Find the resistance of coil at 50 °C. Resistance temperature coefficient of copper is 0·0043 at 0 ºC. 5

12. The details of electrical load in a house are as follows :

(a) 3 lamps of 60 W each used for 5 hours per day.

(b) 2 fluorescent tubes of 40 W each for 4 hours per day.

(c) 4 fans of 75 W each used for 10 hours per day.

(d) 1 electrical iron of 1 kW used for 2 hours per day.

Determine the energy consumption and cost of energy at the rate of ₹ 4·25 per KWh for a month of 30 days.

13. *(a)* Define thermal efficiency. 4

(b) A heat engine gives out 1000 J of heat energy as the useful work. Calculate the energy given to it as input, if its efficiency is 20%. 6

14. Explain the mechanical force on a current carrying conductor in a magnetic field.

15. Define self-inductance and derive an expression for self-inductance.

16. Derive an expression for energy stored in a capacitor.

17. *(a)* State Biot-Savart law. 5

(b) A 20 F air-insulated parallel-plate capacitor is charged to 300 V. Calculate the energy stored in the capacitor. 5

18. Explain the charging methods of batteries by constant current method and constant voltage method.

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