

6040

BOARD DIPLOMA EXAMINATION, (C-16)

MAY/JUNE—2023

DEEE - 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.
(3) Answers should be brief and straight to the point and shall not exceed five simple sentences.

1. Define the law of resistance.
2. State Ohm's law and give the equation with units.
3. Define electric power and electrical energy and give their SI units.
4. State Joule's law of heat.
5. State Fleming's left hand rule.
6. Define the terms (a) flux and (b) reluctance.
7. Define self-inductance.
8. Classify various types of induced e.m.f.
9. State Coulomb's law of electrostatics.
10. Define absolute permittivity.

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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 criterion for valuation is the content but not the length of the answer.

- 11.** (a) Define the terms (i) specific resistance and (ii) conductivity. 5
(b) Explain the effect of temperature on resistance for different materials. 5
- 12.** Two resistances of 4 ohm and 6 ohm are connected in parallel and this combination is connected in series with another resistance of 12 ohm. If the current flowing through 12 ohm resistor is 2A, then determine (i) the current flowing through 4 ohm and 6 ohm resistors and (ii) voltage across the whole circuit. 5+5
- 13.** A house has the following loads : 10
(a) 10 lamps of 60 W each, working for 10 hours a day
(b) 2 electric iron of 1000 W each, working for 1 hour a day
(c) 8 fans of 80 W each, working for 8 hours a day
(d) One 1 kW heater of 1500 W, working for 6 hours/day
Calculate the monthly electricity bill for the month of September, if rate of charge per unit is 75 paise.
- 14.** Calculate the time taken and the cost of energy used to raise the temperature of one litre of water from 25 °C to 90 °C in a 230 V electric kettle. Resistance of kettle is 90 ohm, efficiency of the kettle is 75%, and cost of electrical energy is 25 paise per unit. 10
- 15.** Derive an expression for magnitude of the force on a conductor in a magnetic field. 10
- 16.** (a) Derive an expression for lifting power of a magnet. 5
(b) Explain the concept of self and mutual inductance. 5

/6040

2

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- 17.** Derive an expression for total inductance when two inductances are connected in (a) series aiding and (b) series opposing. 5+5
- 18.** (a) Derive an expression for the energy stored in a capacitor. 5
(b) Compare electrostatic and magnetic circuits in in different aspects. 5

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