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C16–EE–**106**

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BOARD DIPLOMA EXAMINATION, (C–16)
MARCH/APRIL—2017
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 specific resistance and resistance, and mention their units.

2. Determine the resistance of a 564 m length of aluminum conductor whose rectangular cross section is 4 cm by 2 cm. Take $2 \cdot 826 \times 10^{-8}$ ohm-m.

3. Define electrical power and electrical energy, and mention their units.

4. State Joule's law of heat.

5. Define magnetic field intensity and magnetic flux.

6. List the properties of magnetic lines of force.

7. Define coefficient of coupling.

8. Classify the types of induced EMF.

9. List the various types of capacitors.

10. State Coulomb's laws of electrostatics.

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) Derive an expression for resistance at any temperature R_t $R_0(1$ $_0t)$. 5

(b) List out the limitations of Ohm's law. 5

12. (a) Compare series and parallel circuits. 5

(b) The resistance of a coil of wire increases from 40 at 10 °C to 48·25 at 60 °C. Find the temperature coefficient at 0 °C. 5

13. Two lamps of rating 220 V, 60 W and 220 V, 100 W are connected in series across 220 V supply. Calculate the voltage across each lamp and power consumption. What will be the power consumption, if the two lamps are connected in parallel?

14. (a) Draw the incandescent lamp and label the parts. 4

(b) Calculate the time taken and the cost of energy used to rise the temperature of one litre of water from 15 °C to 90 °C in a 250 V electric kettle. Resistance of kettle is 100 , efficiency of the kettle is 85%, cost of electrical energy is 75 paise per unit. 6

15. (a) Derive an expression for magnitude of the force on a conductor in a magnetic field. 6

(b) An electromagnet has an air gap of 4 mm and flux density in the air gap is 1 3 Wb / m^2. Determine the ampere turns for the air gap. 4

16. (a) Explain dynamically-induced EMF. 4

(b) Derive an expression for total and equivalent inductances when two inductances are connected in series-aiding. 6

17. *(a)* Derive an expression for lifting power of magnet. 5

    (b) A coil having 100 turns links with a flux of 1 milli weber. If the direction of this flux is reversed in 0·01 second, find the EMF induced in the coil. 5

18. Draw the field pattern of—

    (a) isolated positive charge;

    (b) isolated negative charge;

    (c) two positive charges;

    (d) two negative charges. 2×4=8

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