C09–EE–**105**

3037

BOARD DIPLOMA EXAMINATION, (C–09)
OCT/NOV—2014
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 *(a)* conductance and *(b)* resistance.

2. State the limitations of Ohm's law.

3. State any three advantages of ACSR conductors.

4. State Fleming's Left Hand rule.

5. State Lenz's law.

6. The current through a 200 turns copper coil is increased from 5 A to 20 A in 0·01 second. Find the e.m.f. induced in the coil.

7. Draw the field patterns of—

(a) isolated positive charge;

(b) isolated negative charge.

8. List the applications of PVC.

9. List the applications of bimetals.

10. Define *(a)* intrinsic semiconductors and *(b)* extrinsic semiconductors.

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)* An aluminium resistor has a resistance of 43·6 at 20 °C and 47·2 at 40 °C. Find the temperature coefficient of resistor at 0 °C.   5

(b) Three resistors of 20 , 5 and 40 are connected in parallel across a 50 V battery. Calculate the current supplied by the battery.   5

12. *(a)* List the properties of aluminium.   5

(b) Write a short note about soldering materials.   5

13. Calculate the time taken and cost of energy used to boil one litre of water from 20 °C by an electric kettle of 100 operating at 250 V. Assume efficiency of kettle as 80%, cost of energy as 85 paise per unit.

14. An iron ring of mean diameter 25 cm has an air gap of 1 mm wide cut in it. The area of cross-section of the ring is 3·5 cm^2. Calculate the number of Amp-Turns required to set up a flux of 0·5 milli Weber in the air gap. Neglect leakage and fringing. Take $_r$ 800 for iron.

15. *(a)* State and explain Faraday's Laws of electromagnetic induction.   6

(b) Calculate the inductance of an iron cored solenoid of 850 turns, 10 cm^2 cross-sectional area and a mean length of 280 cm. Assume relative permeability of iron as 800.   4

16. *(a)* Determine the force between two charges of +5C and +7C when they are spaced 3 m apart in air.   5

(b) Three capacitors have capacitances of 5, 3 and 8 F. Find the total capacitance, when they are connected *(i)* in series and *(ii)* in parallel.   5

17. Explain insulating gases in brief.

18. *(a)* Draw the energy bands of *(i)* conductor, *(ii)* insulator and *(iii)* semiconductor.   5

(b) List the properties of semiconductors.   5

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