C09–EE–105

3037

BOARD DIPLOMA EXAMINATION, (C–09)
MARCH/APRIL—2016
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.

1. State and explain Ohm's Law.   3

2. Define resistance and state its unit.   2+1=3

3. Define annealing and hardening.   1½+1½=3

4. Define *(a)* mmf, *(b)* flux and *(c)* reluctance.   1+1+1

5. State Faraday's Laws of electromagnetic induction.   3

6. Define Lenz's Law.   3

7. Define potential and state its unit.   2+1

8. State any three electrical properties of insulating materials.
                                                               1+1+1=3

9. Classify special purpose materials.   3

10. Distinguish between *P* and *N* type semiconductors.   1+1+1=3

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PART—B   10×5=50

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

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

11. A house has the following loads :

(a) An immersion heats 1000 W, working for 2 hrs/day

(b) 2 kW heaters working for 3 hrs/day

(c) 10 lamps 100 W each working for 10 hrs/day

(d) 5 ceiling fans 60 W each working for 10 hrs/day

Calculate monthly electricity bill at 60 paise per unit.   10

12. *(a)* State the properties of Annealed copper.   5

(b) Write a short note on bimetal.   5

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

(b) An electric kettle is required to raise the temperature of 2 kg of water from 20 °C to 100 °C in 15 min. Calculate the resistance of the heating element if the kettle is to be used on 240 V supply. Assume efficiency of the kettle to be 80%.   6

14. *(a)* Derive the equation for force between two current-carrying conductors.   6

(b) The conductors of an overhead line carry a current of 1200 A each. Find the force between them per metre length. The distance between the centres of the conductors is 1·2 metres.   4

15. *(a)* Determine the equation for energy stored in the magnetic field.   6

(b) A d-c shunt motor has field current 1 Amp and a flux of 0·025 Wb/pole. Calculate the energy stored if the field coil has 1200 turns.   4

16. *(a)* State and explain Coloumb's Laws of electrostatics.   6

    (b) Two small balls having charges one doubles other are placed at a distance of 0·5 m apart in air. If the repulsive force between the balls is 2·75 N, determine the charge on each ball.   4

17. State the properties and applications of the following :   10

    (a) Paper

    (b) Wood

    (c) Ceramics

18. *(a)* What is a zener diode? Explain the operation of zenner diode.   5

    (b) Explain VI characteristics of zener diode.   5

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