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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