



C09-EE-105

3037

BOARD DIPLOMA EXAMINATION, (C-09)

MARCH/APRIL—2018

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 conductor, semiconductor and insulator based on valance electrons. 1+1+1
2. Define work, power and energy. 1+1+1
3. State any three requirements of conducting materials. 1+1+1
4. Define (a) flux density, (b) permeability and (c) m.m.f. 1+1+1
5. Classify and define induced e.m.f.'s. 3
6. Define (a) self-inductance and (b) mutual inductance. 1½+1½
7. Define capacitance and state its unit. 2+1

8. State factors<sup>\*</sup> affecting insulation resistance. 1+1+1
9. State three materials used for fuse. 1+1+1
10. Distinguish between intrinsic and extrinsic semiconductors. 1+1+1

**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. Calculate monthly electricity bill at 70 paise per unit for a residential building with the following load : 10
- (a) 10 nos. 60 W lamps used for 10 hours/day
- (b) 2 nos. 75 W fans used for 12 hours/day
- (c) 1 no. 1500 W heater working for 2 hours/day
12. (a) Compare copper and aluminium. 5
- (b) Explain thermocouple with a neat sketch. 5
13. (a) Explain Joule's law. 4
- (b) An electric kettle marked 500 W, 230 V was found to take 15 min to raise the temperature of 1 kg of water from 15 °C to 100 °C. Determine thermal efficiency. 6
14. (a) State the properties of magnetic lines of force. 5
- (b) A cast steel ring has an air gap of 2 m and iron path of 50 cm. Find the number of  $T$  required to produce a flux density of  $1 \text{ Wb/m}^2$  in the air gap. Assume permeability of steel as 800 and neglect leakage and fringing. 5
15. (a) State and explain Faraday's laws of electromagnetic induction. 6
- (b) A coil of 200 turns is linked by a flux of 0.65 m Wb. If the flux is reversed in 0.012 sec, find e.m.f. induced in the coil. 4

- 16.** (a) Derive the equation for equivalent capacitance when two capacitors are connected in series. 6
- (b) Two capacitors having capacitance 4 F and 6 F are connected in series across a 120 V d.c. supply. Calculate (i) total capacitance and (ii) the charge on each capacitance. 2+2
- 17.** What is PVC? Briefly explain the materials added to PVC to improve its properties. 3+7
- 18.** Discuss the behaviour of a *P-N* junction under forward and reverse biasing. 5+5

\*\*\*

302 302 302 302  
http://www.sbtetonline.com