C14–M–**303**

4251

BOARD DIPLOMA EXAMINATION, (C–14)
OCT/NOV—2015
DME—THIRD SEMESTER EXAMINATION

BASIC ELECTRICAL AND ELECTRONICS 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 Kirchhoff's laws.

2. State and explain Lenz's law.

3. Define inductive reactance, impedance and mention its units.

4. Explain the necessity of starter to start DC motor.

5. Define *(a)* instantaneous value, *(b)* average value of an alternating quantity.

6. List any six applications of a single-phase induction motor.

7. State the relation between phase and line values of voltage and current in three-phase star connected circuit.

8. Compare *P*-type and *N*-type semiconductors.

9. State the working principle of PMMC instruments.

10. Explain briefly the need of earthing to electrical equipment.

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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) 10 lamps of 60W working for 6 hrs a day

(b) 4 lamps of 100W working for 4 hrs a day

(c) 6 fans of 70W working for 12 hrs a day

(d) 3 heaters 1000W working for 3 hrs a day

Calculate the total number of units consumed in 30 days and the amount of energy bill at the rate of 150 paise per unit.

12. *(a)* Derive the expression for energy stored in an inductor. 5

(b) Derive the expression for lifting power of a magnet. 5

13. *(a)* List the losses take place in a DC machine. 5

(b) Explain the working principle of a DC motor. 5

14. A resistance of 12 ohms is connected in series with an inductive reactance of 9 ohms. The current in the circuit is 10A. Find *(a)* voltage across entire circuit, *(b)* phase angle, *(c)* active power, *(d)* power factor and *(e)* voltage across inductance and resistance.

15. *(a)* Explain the working principle of three phase squirrel cage induction motor. 5

(b) Explain the working principle of single phase transformer. 5

16. *(a)* Draw the input characteristics and output characteristics of a transistor connected in common base configuration. 5

   (b) Describe the operation of Zener diode with a diagram. 5

17. Explain the construction and working principle of single-phase induction type energy meter with a neat diagram.

18. *(a)* Describe the connection diagram of three point starter for a DC motor. 5

   (b) Explain the constructional features of an alternator. 5

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