



C14-M-303

4251

BOARD DIPLOMA EXAMINATION, (C-14)

OCT/NOV—2017

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.

(3) Answers should be brief and straight to the point and shall not exceed *five* simple sentences.

1. Define Ohm's law and state the laws of resistance.
2. Define the terms related to magnetic field (a) magnetic field strength and (b) permeability.
3. Explain Flemings right hand rule.
4. List the types of DC generators based on excitation.
5. Define the terms related to sinusoidal AC wave (a) RMS value, (b) average value.
6. Define phase and phase difference related to sinusoidal AC wave.

7. State applications of three-phase induction motor.
8. Define the terms related to semi-conductors (a) valence band, (b) conduction band and (c) forbidden energy gap.
9. What is the need of earthing of electrical equipment?
10. Draw the connection diagram of single phase energy meter with load.

**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. (a) Derive the expression for total resistance when three resistance  $R_1$ ,  $R_2$  and  $R_3$  are connected in parallel. 5
- (b) When two resistances of 5 and 20 are connected in parallel across 240 V supply. Calculate the total current and current through each resistance. 5
12. (a) Define self inductance ( $L$ ), mutual inductance ( $M$ ) and coefficient of coupling ( $K$ ). State the relation between  $L_1$ ,  $L_2$ ,  $M$  and  $K$ . 5
- (b) Derive an expression for energy stored in a magnetic field. 5
13. Draw a neat diagram of DC generator. Label all its parts. 3+1+4+2
14. (a) Explain the back e.m.f. of DC motor. 5
- (b) Describe with a neat sketch about a welding transformer. 5

15. A coil of resistance of  $10\ \Omega$  is connected in series with a coil of inductance of  $0.02\text{H}$  and is connected to AC mains of  $100\text{V}$  and  $50\text{Hz}$ . Calculate current, power factor and voltage drop across both resistance and inductance. 10
16. (a) Explain the constructional feature of alternator. 5  
(b) Explain the working principle of alternator. 5
17. (a) Briefly explain the formation of  $P-N$  junction diode. 5  
(b) Describe the working of  $P-N$  junction diode with forward bias and reverse bias using proper diagrams. 5
18. Draw and explain the construction and working of AC single-phase induction type energy meter. 10

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