4251

C14–M–**303**

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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   is connected in series with a coil of inductance of 0 02*H* and is connected to AC mains of 100 V and 50 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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