C14–M–**303**

4251

BOARD DIPLOMA EXAMINATION, (C–14)
OCT/NOV—2016
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. State Kirchhoff's voltage law (KVL) and Kirchhoff's current law (KCL).

2. Define the terms *(a)* electric field intensity and *(b)* permittivity related to electrostatics.

3. Define work, power and energy, and mention their units.

4. Draw the power flow diagram of DC generator.

5. Define the terms *(a)* form factor and *(b)* amplitude related to sinusoidal AC wave.

6. State the relationship between speed and frequency of an alternator.

7. List the types of single-phase induction motors.

8. Distinguish between intrinsic and extrinsic semiconductors.

9. Draw a neat sketch of pipe earthing and label the parts.

10. State the procedure to be adopted in case of electric shock.

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)* State Faraday's laws of electromagnetic induction.   5

(b) A heater immersed in water has a resistance of 125 and is connected to a 500 V DC supply. Calculate *(i)* current taken and *(ii)* power.   5

12. *(a)* Derive an expression for lifting power of a magnet.   5

(b) Define the terms *(i)* flux and *(ii)* reluctance of a magnetic field.   5

13. *(a)* Draw the connection diagram of welding generator and label the parts.   5

(b) Briefly explain the working principle of DC generator.   5

14. *(a)* Explain speed control of DC shunt motor by *(i)* field control and *(ii)* armature control methods.   5

(b) State the relation (three-phase system) between phase values and line values of voltage and current in case of *(i)* star and *(ii)* delta connections.   5

15. A circuit consists of 12 resistance is in series with a capacitance of 100 F. It is connected across a supply of 230 V, 50 Hz. Find *(a)* reactance, *(b)* impedance *(c)* current, *(d)* power factor and *(e)* power.   10

16. *(a)* Explain the working principle of transformer with neat sketch. 5

(b) Draw a neat sketch of star-delta starter used in 3-phase induction motor. 5

17. *(a)* Describe the operation of Zener diode with the help of neat sketch. 5

(b) Explain the operation of LED with neat sketch. 5

18. Explain the construction details and working principle of dynamometer-type wattmeter with neat sketch. 10

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