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C14–M–303

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BOARD DIPLOMA EXAMINATION, (C–14)

MARCH/APRIL—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) Answer should be brief and straight to the point and shall not exceed *five* simple sentences.

1. Define Ohm's law and calculate the value of resistance of the filament of a bulb of 230 V and 5 A.

2. Define Lenz's law.

3. State Fleming's right-hand rule.

4. List the applications of DC motors.

5. Define the following terms related to sinusoidal AC wave :

(a) Instantaneous value

(b) Time period

6. Define turns ratio and voltage transformation ratio of a transformer.

7. Explain about polyphase system.

8. Write short notes on P-type and N-type semiconductors.

9. What are the effects of electric shock and burn in a human body?

10. What are the precautions to be taken while working on electrical equipment?

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)* Distinguish between dynamically induced e.m.f. and statically induced e.m.f. 5

(b) An air-cored circular coil having an internal diameter of 5 cm is wound uniformly with 300 turns. Calculate the self-inductance of the coil if its mean length is 80 cm. 5

12. *(a)* Derive an expression for the total resistance when three resistances R_1, R_2 and R_3 are connected in series. 5

(b) The effective resistance of two resistances when connected in series across 200 V supply is 50 . If the voltage drop across one of the resistance is 80 V, find the values of two resistances. 5

13. *(a)* Briefly explain the working principle of a DC motor. 5

(b) State the relation between currents and voltages for DC shunt and series generators. 5

14. *(a)* Draw a neat sketch of a three-point starter used in DC motors. 5

(b) With a neat sketch, describe the functionality of DOL starter used in three-phase induction motors. 5

15. A series circuit having a resistance of 40 , capacitance of 20 F and inductance of 0·2 H, is connected across 110 V, 50 Hz supply. Calculate *(a)* impedance, *(b)* current and *(c)* power factor. 10

16. Explain the constructional features of *(a)* squirrel-cage induction motor and *(b)* slip-ring induction motor. 10

17. *(a)* Explain the operation of *N-P-N* transistor with neat diagram. 5

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

18. Explain the constructional details and the working principles of a moving-coil ammeter with neat sketch. 10

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