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C14–M–303

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BOARD DIPLOMA EXAMINATION, (C–14)

MARCH/APRIL—2018

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. A resistance of 7 ohms is connected in series with a parallel combination of 4 ohms and 5 ohms. If the applied voltage is 20 V, find the voltage across 7 ohms resistance.

2. Define magnetic field strength.

3. Explain Fleming's right-hand rule.

4. State the relationship between line and phase voltages, and line and phase currents in star connected circuit.

5. Define RMS value.

6. Write EMF equation of a transformer.

7. Explain significance of back EMF in a motor.

8. Explain indicating, recording and integrating instruments.

9. Explain conductor, semiconductor and insulators.

10. What is the need of earthing of 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)* State and explain Faraday's laws of electromagnetic induction. 5

(b) Distinguish between self-induced e.m.f. and mutual induced e.m.f. 5

12. *(a)* Explain Kirchhoff's laws. 4

(b) An air-cored inductive coil of 1 m length and 5 cm mean diameter is wound with 1500 turns. What will be the energy stored by the coil when it carries a current of 20 A? 6

13. *(a)* Explain DC welding generator. 5

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

14. An inductive coil having a resistance of 15 ohms takes a current of 4 A when connected to a 100 V, 60 Hz AC supply. If the coil is connected to a 100 V, 50 Hz supply, calculate—

(a) the current;

(b) the power;

(c) the power factor. 3+3+4=10

15. *(a)* Explain the working principle of 3-phase induction motor. 5

(b) Explain the working principle of AC generator. 5

16. *(a)* Describe the star-delta starter with a neat sketch. 5

(b) Explain speed control of DC shunt motor with neat circuit diagram. 5

17. *(a)* Explain the construction and working of transistors. 6

(b) Compare between *P*-type and *N*-type semiconductors in any four aspects. 4

18. Explain the construction and working of an AC single-phase induction-type energy meter. 6+4

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