C09–M–304

3248

BOARD DIPLOMA EXAMINATION, (C–09)

OCT/NOV—2013

DME—THIRD SEMESTER EXAMINATION

ELECTRICAL ENGINEERING AND BASIC ELECTRONICS

Time : 3 hours] [*Total Marks* : 80

PART—A

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 work, power, energy and mention their units.

2. Define *(a)* Self-inductance and *(b)* Mutual inductance.

3. State Faraday's laws of electromagnetic induction.

4. Classify DC generators on the basis of excitation.

5. What is the significance of back e.m.f. in a DC motor?

6. State the advantages of polyphase system over single-phase system.

7. Define *(a)* amplitude, *(b)* time period and *(c)* frequency.

8. What are the indications of a fully-charged battery?

9. Distinguish between intrinsic and extrinsic semiconductors.

10. What is the need of earthing of electrical equipment?

PART—B

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 Kirchhoff's laws. 6

(b) State the laws of resistance. 4

12. *(a)* If a coil of 1000 turns is linked with a flux of 2 mb, when carrying a current of 5 A, calculate—*(i)* self-inductance of the coil and *(ii)* energy stored in a magnetic field. 5

(b) Explain the necessity of starter in a DC motor. 5

13. *(a)* Explain the speed control of DC shunt motor, using *(i)* field-control method and *(ii)* armature-control method. 6

(b) Calculate the e.m.f. generated in a 8-pole lap wound shunt generator running at 300 r.p.m., if the flux per pole is 0·1 Wb and the No. of armature conductions is 960. 4

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

(b) Describe the welding transformer with a neat sketch. 5

15. *(a)* An inductive circuit has a resistance of 10 ohms in series with an inductance of 0·03 H. Calculate the current and power factor, when connected across 230 V, 50 Hz supply. 4

(b) Describe the star-delta starter with a neat sketch. 6

16. *(a)* List the applications of single-phase induction motor. 5

(b) Compare between primary and secondary cells. 5

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

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

18. *(a)* Explain the construction and working of Permanent Magnet Moving Coil (PMMC) ammeter. 6

(b) What are the effects of electric shock? 4

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