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C09–M–304/C09–CHST–304

3248

BOARD DIPLOMA EXAMINATION, (C–09)

MARCH/APRIL—2016

DME—THIRD SEMESTER EXAMINATION

ELECTRICAL ENGINEERING AND BASIC ELECTRONICS

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. State the expression for self-inductance and mention its units.

2. Define dynamically induced e.m.f.

3. Define work and write its unit.

4. State the materials used for the following parts of d.c. generator :

(a) Armature winding

(b) Commutator

(c) Yoke

5. Draw power flow diagram of d.c. generator.

6. State how the direction of rotation of capacitor start 1-phase induction motor can be reversed.

7. State the expression for power in 1-phase a.c. circuit and write the formula for power factor.

8. Define capacity of a battery and state its unit.

9. How are *p*-type and *n*-type materials formed?

10. State the effect of electrical shock and burn.

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. The field coil of a d.c. machine has 400 turns and has an initial flux of 0·05 Wb. Calculate the e.m.f. induced in the coil, when—

(a) the flux is reduced to zero in 0·015 sec;

(b) the flux is reduced to a residual magnetism of 0·01 Wb in 0·01 sec. 10

12. A d.c. long-shunt compound motor takes a current of 30-A from a 230-V d.c. supply. Its armature, series field and shunt field resistances are 0 06 , 0 08 and 115 respectively. Calculate the back e.m.f. of the motor. 10

13. *(a)* Explain phase difference in 3-phase system. 5

(b) Explain star and delta connections. 5

14. *(a)* Draw a neat sketch of welding transformer. 5

(b) Explain the principle of working of an alternator and mention the relationship between its frequency and speed. 5

15. *(a)* Explain the operation of LED. 5

(b) Explain the operation of Zener diode. 5

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

17. *(a)* Define *(i)* permeability and *(ii)* reluctance. Mention their units. 4

(b) A 4-pole lap wound d.c. motor having 648 armature conductors and it has flux per pole of 25 m Wb. Find the value of toque, when its armature current is 60 A. 6

18. *(a)* Explain the constructional details of a 3-phase induction motor. 5

(b) Explain the construction of a lead-acid cell. 5

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