



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.

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7. State the <sup>\*</sup> 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 Ω, 0.08 Ω and 115 Ω respectively. Calculate the back e.m.f. of the motor. 10
13. <sup>\*</sup> (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 <sup>\*</sup> 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 torque, 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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