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C09–M–304/CHST–304

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BOARD DIPLOMA EXAMINATION, (C–09)

MARCH/APRIL—2018

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) Answers should be brief and straight to the point and shall not exceed *five* simple sentences.

1. State Lenz's law.

2. Define permittivity and state its units.

3. State Ohm's law.

4. State any three applications of a DC shunt motor.

5. State the materials used for the following parts of DC generator :

(a) Armature winding

(b) Commutator

(c) Yoke

6. List any three applications of a 1-phase induction motor.

7. State the value of power factor of *(a)* pure resistance, *(b)* pure inductance and *(c)* pure capacitance.

8. Define capacity of a battery.

9. State the formation of *P-N* junction diode.

10. State the purpose of earthing the 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 coil *X* having 400 turns and coil *Y* having 500 turns are mutually coupled together. When 5 amps current flows in coil *X*, a flux of 7·5 milliwebers links with both coils. Calculate self-inductance of coil *X* and mutual inductance between the two coils. 10

12. A DC series motor draws a power of 4 kW from a 200 V supply. Its armature and series field resistances are 0·05 and 0·1 respectively. Calculate the back e.m.f. of the motor. 10

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

(b) Explain the working principle of alternator. 5

14. Explain star-delta starter with a neat sketch. 10

15. *(a)* Distinguish between Zener and Avalanche breakdown. 5

(b) Explain the operation of LCD. 5

16. Explain the construction and working principle of permanent magnet moving coil (PMMC) ammeter. 10

17. *(a)* State and explain Kirchhoff's current law. 5

(b) Explain the speed control of DC shunt motor by armature control method. 5

18. *(a)* Describe welding transformer with a neat sketch. 5

(b) Compare between lead acid and nickel iron cells. 5

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