C09–M–304/CHST–304

3248

BOARD DIPLOMA EXAMINATION, (C–09)

OCT/NOV—2017

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. Define magnetic field strength and state its unit.

2. Define electric field.

3. Define self-inductance and mention its units.

4. Write voltage and current equation of long shunt compound motor.

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

   (a) Armature winding

   (b) Commutator

   (c) Yoke

6. State the working principle of a transformer.

7. Define RMS value.

8. State the indications of a fully charged lead acid battery.

9. Draw a neat diagram of output characteristic of CB configuration of a transistor.

10. List any three parts of moving coil instrument and also mention their function.

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PART—B   10×5=50

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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 having 120 turns has a resistance of 100   and is placed in a magnetic field of 1·5 m wb. The coil is connected in series with a galvanometer of resistance 500 . Find the e.m.f. induced in coil and current in the circuit if the coil is moved in 0·02 sec from the given field to a field of 0·7 m wb.   10

12. Explain the classification of DC generators with simple diagrams.   10

13. *(a)* Explain the necessity of a starter.   5

    (b) Explain the working principle of a 1-phase induction motor.   5

14. A series circuit consisting 10   resistance, 10   inductive reactance and 5   capacitive reactance in series is connected across a 1-phase supply of 230 V, 50Hz; calculate—

    (a) impedance;

    (b) current;

    (c) voltage across the resistance;

    (d) power factor;

    (e) power consumed.   10

15. *(a)* Explain the difference between intrinsic and extrinsic semiconductors. 5

(b) Explain the formation of P-N junction diode. 5

16. Explain the construction and working principle of single-phase induction-type energy meter. 10

17. *(a)* *(i)* State Lenz's law.

(ii) State Fleming's right-hand rule. 5

(b) Draw a neat sketch of 3-point starter. 5

18. *(a)* Describe with sketch star-delta starter. 5

(b) Explain the chemical reactions of Nickel-Iron cell during charging. 5

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