C09–M–304/CHST–**304**

3248

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. Define work, power and energy and mention their units.

2. Define *(a)* self-inductance and *(b)* mutual inductance.

3. State Faraday's laws of electromagnetic induction.

4. State the materials used for the following parts of DC generators :

(a) Yoke

(b) Armature core

(c) Brushes

5. State the applications of DC series motor.

6. State the relation between frequency and speed of an alternator.

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

8. Define capacity of battery.

9. Briefly explain the formation of *P-N* junction diode.

10. State the procedure to be immediately adopted in case of electric shocks.

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 house has the following loads :

(a) 10 lamps of 60 W each working for 8 hours a day

(b) 4 lamps of 100 W each working for 5 hours a day

(c) 2 heaters of 1000 W each working for 3 hours a day

(d) 5 fans of 100 W each working for 12 hours a day

Calculate the total number of units consumed in 30 days and the amount of bill at the rate of 50 paisa/unit.

12. *(a)* A resistor of 4 ohms is connected in parallel to the resister of 8 ohms and the whole combination is connected in series with a resistor of 2 ohms. Calculate the effective resistance.

(b) Classify DC generators on the basis of excitation.

13. *(a)* Explain the working principle of DC motor.

(b) A 250 V DC motor takes 41 A at full load. It armature and shunt field resistance are 0·1 ohm and 250 ohms. Find back e.m.f on full load.

14. A series circuit having a resistance of 40 ohms, capacitance of 20 micro Faradays and inductance of 0·2 H is connected across 110 V, 50 Hz supply. Calculate *(a)* impedance, *(b)* current and *(c)* power factor.

15. Explain the star-delta starter of three-phase induction motor with a neat sketch.

16. *(a)* A 1-phase 210 V, 50 Hz supply is connected across a series circuit consisting of 6 ohms resistance and an unknown inductance. Find the inductance if the current drawn from the supply is 10 A.

(b) Explain the construction of lead acid cell.

17. Explain the working of *N-P-N* transistor with a neat sketch.

18. Explain the construction and working principle of moving coil voltmeter.

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