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C09–M–304

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BOARD DIPLOMA EXAMINATION, (C–09)

OCT/NOV—2014

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 the expression for coefficient of coupling.

2. Define electric field intensity.

3. State Ohm's law.

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

(a) Armature winding

(b) Commutator

(c) Yoke

5. State the relationship between currents and voltages for DC short shunt compound generator.

6. State the relationship among turns ratio, voltage ratio and current ratio in a transformer.

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

8. Compare lead-acid and nickel-iron cells in any three aspects.

9. List the materials used for making LED.

10. Draw the connection diagram of single-phase energy meter with load.

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 conductor is moving at 90° in a magnetic field of flux density 1 4 Wb/m^2. The length of the conductor is 125 cm and the velocity of conductor is 2 3 m/sec. Find the e.m.f. produced in the conductor. Also find e.m.f. when velocity is 2 5 m/sec.

12. Explain DC 3-point starter with a neat sketch.

13. Explain *(a)* average value, *(b)* RMS value and *(c)* form factor.

14. A 1-phase supply of 200 V, 50 Hz is connected across a circuit consisting of 5 resistance in series with 80 mH inductance. Find—

(a) reactance;

(b) impedance;

(c) current;

(d) voltage drop across resistance;

(e) voltage drop across inductance.

15. *(a)* Explain the working of a PN junction diode with reverse bias.

(b) Explain the formation of *P*-type material.

16. Explain construction and working principle of moving-iron voltmeter.

17. *(a)* Define *(i)* magnetic flux and *(ii)* magnetic field strength and also mention their units.

(b) Explain the back e.m.f. of a DC motor.

18. *(a)* Explain constructional features of a 3-phase squirrel-cage induction motor.

(b) Explain the constant voltage method of charging the batteries.

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