



C09-M-304/CHST-304

**3248**

**BOARD DIPLOMA EXAMINATION, (C-09)**

**APRIL/MAY—2015**

**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 permeability and write its unit.
2. Define mutual inductance and also mention its unit.
3. Distinguish between power and energy.
4. State any three applications of a DC shunt motor.
5. List the types of self-excited DC generator.
6. Define instantaneous value of an alternating quantity and write its equations.
7. State how the direction of rotation of a 3-phase induction motor can be reversed.
8. State the indications of a fully charged lead acid battery.
9. Distinguish between intrinsic and extrinsic semiconductors.
10. Draw the connection diagram of single-phase energy meter with load.

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**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  $90^\circ$  in a magnetic field of flux density  $1.4 \text{ Wb/m}^2$ . The length of the conductor is 125 cm and the velocity of conductor is  $2.3 \text{ m/sec}$ . Find the e.m.f. produced in the conductor. Also find e.m.f., when velocity is  $2.5 \text{ m/sec}$ .
- 12.** A 400-V DC short shunt compound generator is delivering a load of 50 A. Its armature, series and shunt field resistances are  $0.1 \Omega$ ,  $0.15 \Omega$  and  $163 \Omega$ . Calculate the generated e.m.f.
- 13.** A 1-phase supply of 230 V, 50 Hz is connected across a circuit consisting of  $15 \Omega$  resistance in series with  $120 \mu\text{F}$  capacitance. Find—  
(a) reactance;  
(b) impedance;  
(c) current;  
(d) voltage drop across resistance;  
(e) voltage drop across capacitance.
- 14.** (a) Explain the working principle of transformer.  
(b) Explain the constructional details of alternator.
- 15.** (a) Explain the operation of LED.  
(b) Explain the operation of zener diode.
- \* **16.** Explain construction and working principle of dynamometer type wattmeter with a neat sketch.
- 17.** (a) Define (i) permittivity and (ii) capacitance and mention their units.  
(b) Draw schematic diagram of a DC series motor and state the relationship between voltages and currents.
- 18.** (a) Draw the schematic representation of a capacitor starts single-phase induction motor.  
(b) Explain the constant current method of charging the batteries.

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