



C14-EC-306

4242

BOARD DIPLOMA EXAMINATION, (C-14)  
MARCH/APRIL—2017  
DECE—THIRD YEAR EXAMINATION  
ELECTRICAL TECHNOLOGY

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. Perform the following operations in the polar form :

(a)  $A \cdot B$

(b)  $A / B$  where  $A = (6 - j8)$   $B = (3 + j4)$

2. Define bandwidth of a resonant circuit.

3. Explain the significance of back e.m.f.

4. State and explain the Fleming's right-hand rule.

5. Give the relation between phase voltage and line current in delta configuration.

6. Draw the phasor diagram of transform on load for resistive load.
7. Classify transformers based on power rating and applications.
8. Write any three applications of potential transformer and isolation transformer.
9. Write any three applications of servo motors.
10. Explain the working principle of alternator.

**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. When a resistance of  $8 \Omega$ , inductance of  $0.1 \text{ H}$  and capacitor of  $120 \mu\text{F}$  are connected in series across  $230 \text{ V}$ ,  $50 \text{ Hz}$  supply and then calculate—(a) impedance, (b) total current, (c) power factor and (d) voltage across resistor, capacitor and inductor. Also find power dissipated in the circuit. 10
12. (a) Explain the resonance in parallel circuits. 5  
 (b) Compare between the series and parallel resonance. 5
13. (a) Explain the working principle of DC motor. 5  
 (b) Derive the equation for armature torque of DC motor. 5
14. Draw the neat sketch of 3-point starter and explain. 10

15. Three coils each having resistance of 9  $\Omega$  and the inductance of 0.01 H are connected in star across 440 V, 50 Hz three-phase supply. Calculate the (a) phase voltage, (b) phase current, (c) line current and (d) total power consumed. 10
16. Explain the operation of transformer on load with the help of vector diagram under leading, lagging and unity power factor. 10
17. Explain the working principle of capacitor start single-phase induction motor and its application. 10
18. (a) Explain the open-circuit test and their purposes in transformer. 5
- (b) Explain the working principle of synchronous motor. 5

\*\*\*