C14–EC–**306**

4242

BOARD DIPLOMA EXAMINATION, (C–14)
OCT/NOV—2017
DCE—THIRD SEMESTER 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) $A \quad B$

   (b) $A \quad B$

   where $A \quad (6 \quad j8)$, $B \quad (3 \quad j4)$

2. Write the formula for lower cut-off and upper cut-off frequency.

*

3. Explain the need of starter to start DC motor.

4. State the Faraday's laws of electromagnetic induction.

5. Explain the concept of phase sequence.

6. Define the coefficient of coupling.

7. Draw the torque/speed characteristics of 3-phase induction motor.

8. Write any three applications of 3-phase transformers.

9. Write any three applications of universal motor.

10. Write the relation between phase voltage and line current in star configuration.

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 10 , inductance of 0·1 H and capacitance of 150 F are connected in series across 250 V, 50 Hz supply, 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)* Compare between the series and parallel resonance. 5

(b) Draw the graphical representation of parallel resonance. 5

13. Explain the dynamically and statically induced EMF. 5+5

14. *(a)* Explain the principle of DC motor. 5

(b) List the losses in a DC generator. 5

15. Three coils each having resistance of 8 and the inductance of 0·03 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 total inductance with series connections with reference to direction of fluxes. 5+5

17. Explain the working principle and constructional features of servomotors. 5+5

18. *(a)* Explain the production of rotating magnetic field in 3-phase AC machine. 5

(b) Explain the loss in a transformer. 5

★ ★ ★