C14–EC–**306**

4242

BOARD DIPLOMA EXAMINATION, (C–14)
OCT/NOV—2018
DECE—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. State the conditions for parallel resonance.

2. Define bandwidth of a resonant circuit.

3. List the two types of winding used in DC generators and state their use.

4. Explain the need for starter.

5. List the merits of 3-phase system over single-phase.

6. What are the reasons for using laminations in transformer core?

7. Define regulation of transformer.

8. Define slip of an induction motor.

9. List the applications of synchronous motors.

10. List the applications of stepper motor.

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 coil of resistance 50 ohms and inductance of 0·1 Henry is connected in series with a capacitance of 150 microfarads. Find *(a)* total impedance, *(b)* current, and *(c)* power factor of the circuit when the supply voltage is 220 V at 50 Hz.

12. *(a)* Derive the equation for resonant frequency in RLC series circuit.

(b) A coil of resistance 40 ohms and inductance of 0·75 Henry is connected in series with a capacitor of *C* farads. The circuit is connected across 250 V, 50 Hz a.c. supply. Calculate the value of capacitance at resonant condition.

13. *(a)* State Fleming's right-hand rule.   4

(b) State Faraday's laws of electromagnetic induction.   6

14. Explain speed control of DC shunt motor by armature, field control and armature resistance control.

15. *(a)* Give the relation between line voltage and phase voltage and line current and phase current in star configuration.   3

(b) Explain how power from a power plant reaches the consumer with a line sketch.   7

16. *(a)* Explain the working principle of transformer.   5

    (b) A single-phase transformer has 400 turns on primary winding and 1200 turns on secondary winding. If it is operating at 50 Hz supply with a maximum flux of 0·04 webers, find the primary and secondary induced e.m.f.   5

17. Explain the production of rotating magnetic field.

18. *(a)* Explain the effect of resistance on bandwidth.   5

    (b) Explain power stages in DC motor.   5

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