C14–EE–**502**

4637

BOARD DIPLOMA EXAMINATION, (C–14)

SEPTEMBER/OCTOBER - 2020

DEEE—FIFTH SEMESTER EXAMINATION

AC MACHINES—II

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 any three applications of synchronous motor.

2. State the principle of working of synchronous motor.

3. Draw torque-slip curves of a 3-phase induction motor.

4. State the applications of a 3-phase induction motor.

5. A 3-phase induction motor draws 80 kW from supply and it is running with slip of 6%. Calculate the rotor copper loss/phase if the stator loss is 1 kW.

6. Write the various types of single-phase induction motors.

7. State the necessity of the auxiliary winding in a 1-phase induction motor.

8. List the applications of the split phase motor.

9. List the types of Stepper motors.

10. List the applications of brushless DC motor.

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PART—B   10×5=50

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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 3-phase, 11 Kv, star-connected synchronous motor draws current of 60 A. The effective resistance and synchronous reactance are 1·2 /phase and 30 /phase respectively. Calculate *(a)* power supplied to the motor and *(b)* induced e.m.f. for 0·8 p.f. lag and 0·8 p.f. lead.

12. Explain about the generation of rotating magnetic field in a 3-phase system.

13. *(a)* Derive the torque equation of a 3-phase induction motor.   5

(b) A 3-phase slip ring induction motor has rotor resistance and standstill reactance as 0·02 /phase and 0·1 /phase respectively. Determine the value of external resistance/phase to be inserted in the rotor circuit to give maximum torque at starting.   5

14. *(a)* Explain the construction of stator of a 3-phase induction motor.   5

(b) Explain about the working of DOL starter with a neat diagram.   5

15. An 18·85 kW, 6-pole, 50 Hz, three-phase slip induction motor runs at 950 r.p.m. on full load with a rotor current per phase of 38 A. The mechanical losses are 1 kW. Find—

    (a) mechanical power developed by the rotor;

    (b) rotor copper loss;

    (c) rotor resistance per phase.

16. Explain the speed control of a 3-phase induction motor by pole changing method with relevant sketches.

17. Explain the working principle of 1-phase induction motor by double field revolving theory.

18. Explain the working of a 1-phase a.c. series motor.

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