EW

Reg. No. : ....

Name : ....

TRIVANDRUM-11

Sixth Semester B.Tech. Degree Examination, April 2014
(2008 Scheme)
Branch : ELECTRICAL & ELECTRONICS
08.601 : Electrical Machines – III (E)

Time : 3 Hours

Max. Marks : 100

Instruction : *Answer **all** questions in Part-**A** and **one full** question from **each** Module in Part-**B**.*

PART – A

(4 Marks each)

1. Why does an induction motor never runs at synchronous speed ?

2. Prove the relation between rotor copper loss and rotor input of a 3-phase induction motor.

3. What is meant by Cogging of 3-phase induction motor ? How it can be eliminated ?

4. Draw and explain the torque-slip curve of a 3-phase induction motor.

5. What is a double cage induction motor ? What are its advantages over ordinary induction motor ?

6. Explain the braking of 3-phase induction motor by plugging.

7. Explain the starting methods of slip ring induction motor.

8. Explain the operation of single phase induction motor on the basis of double field revolving theory.

9. What is a universal motor ? And discuss its operation.

10. Briefly explain magnetic levitation.

PART – B

(20 Marks each)

Module – I

11. a) Starting from first principles, develop the equivalent circuit of a 3-phase induction motor.

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b) The power input to the rotor of a 3-phase,50 Hz, 6 pole induction motor is 80 kW. The rotor emf makes 100 complete alternations per minute. Find

    a) Slip

    b) Motor speed

    c) Mechanical power developed

    d) Rotor Cu loss/phase

    e) Rotor resistance/phase if rotor current is 65 A

    f) Torque developed.   **12**

OR

12. a) Explain the tests to be conducted on a 3-phase induction motor for drawing the circle diagram.   **10**

    b) Obtain the relation between the power transferred to the rotor, mechanical power developed and copper losses in the rotor of a 3-phase induction motor.   **10**

Module – II

13. a) Draw a sketch of DOL starter and explain its working.   **10**

    b) A three phase induction motor takes 190% of full load line current and develops 36% of full load torque by a star-delta starter. What would be the starting torque and current if an auto transformer with 70% tapping were used ?   **10**

OR

14. a) Draw and explain the method of regenerative braking as applied to polyphase induction motor.   **10**

    b) Discuss briefly the various methods of speed control of 3-phase induction motor.   **10**

Module – III

15. a) Discuss the procedure to determine the parameters of equivalent circuit of a single phase induction motor.   **10**

    b) Explain the different starting methods of single phase induction motor.   **10**

OR

16. a) Draw and explain the phasor diagram of a single phase series motor.   **10**

    b) Write short notes on :   **10**

    a) Single phase repulsion motor.

    b) Linear induction motor.