

Sixth Semester B.Tech. Degree Examination, June 2015
(2008 Scheme)

08.601 – ELECTRICAL MACHINES – III (E)

Time : 3 Hours

Max. Marks : 100

Instruction : Answer **all** questions from **Part A** and **any one** question from **each** Module of **Part B**.

PART – A

(4 marks each)

1. What is the purpose of starter in three phase induction motors ?
2. Distinguish between an Induction Motor and a Transformer.
3. Discuss the principle of operation of a switched reluctance motor.
4. Draw the phasor diagram of a three phase induction motor and mention the related equations.
5. A 6 pole, 50 Hz slip ring induction motor has a resistance of 0.2Ω per phase runs at 960 rpm. Calculate the resistance to be included in the rotor circuit to reduce the speed to 800 rpm.
6. What is crawling ? How does it affect the working of a three phase Induction motor ?
7. Indicate the various schemes for providing excitation to synchronous induction motors.
8. Describe the v/f control of speed of an induction motor.
9. What is DC dynamic braking of induction motors and mention the main advantage of this over the other electrical braking methods.
10. Draw the circle diagram of an Induction Generator and show how the efficiency is calculated as a motor and generator for a load current.





PART – B

(20 marks each)

Module – I

11. a) Describe with neat connection diagrams the experiments to be performed to find out the parameters of equivalent circuit of a three phase induction motor.
- b) The power input to the rotor of a 440 V, 50 Hz, 3ϕ , 6 pole induction motor is 60 kW. It is observed that the rotor emf makes 90 cycles per minute. Calculate :
- 1) Slip
 - 2) Rotor speed
 - 3) Rotor copper loss
 - 4) Power developed
 - 5) BHP and efficiency if friction and windage loss is 3% of rotor output and stator loss is 1.5 kW.

OR

12. Draw the circle diagram for a 5 HP, 200 V, 50 Hz, 4 pole three phase star connected Induction motor from the following test data :
- No load test : 200 V, 5 A, 350 W
- Blocked rotor test : 100 V, 26 A, 1700 W.
- Estimate for full load condition, current, pf, slip, torque and efficiency.

Module – II

13. a) Explain the constructional features and working of a double cage induction motor. Draw the related T- s characteristic and circle diagram for this machine.
- b) Derive the expression for speed of a cascaded set of Induction motors.

OR

14. a) What are the advantages of synchronous induction motor over ordinary synchronous motors ?
- b) Calculate the steps in a 5 step starter for a 3ϕ slip ring induction motor. The slip at maximum starting current is 2%. If the rotor resistance per phase is 0.015Ω .



Module – III

15. a) Explain the working of a shaded pole induction motor and draw the T-s characteristic. Mention the applications.
- b) What is double field revolving theory ? Explain. And hence develop the T-s characteristic of a single phase induction motor and prove that it is not self starting.
- b) Explain the working of a repulsion motor and draw the T-s characteristic. Mention the field of application of this machine.

OR

16. a) What are the different classifications of LIM ? And explain the applications of each.
- b) What is a universal motor ? How it can be developed from a DC series motor?

