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M – 6270

Reg. No. :

Name :



Sixth Semester B.Tech. Degree Examination, December 2021

08.601 — ELECTRICAL MACHINES – III (E)

(2008 Scheme)

Time : 3 Hours

Max. Marks : 100

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

PART – A

1. How Rotating magnetic field produced in 3 phase induction motor?
2. Derive the expression for Full load torque in terms of Maximum torque, slip and rotor parameters of an inductor motor.
3. Describe about starting torque, full load and pull out torque in an induction motor.
4. The useful torque of a three phase, 50 Hz, 8 pole induction motor is 190 Nm. The rotor frequency is 1.5 Hz. Calculate the net output at shaft if mechanical losses are 700 watts. -
5. What is necessity of braking? Also list different methods of braking.
6. Describe about cascade control of two induction motors.
7. Discuss the requirements of a self excited induction generator for generation of power.
8. Draw the diagram of a shaded pole single phase induction motor.
9. How do you calculate the stepping angle of a switched reluctance motor?
10. Describe about magnetic levitation.

(10 × 4 = 40 Marks)



PART – B

Module – I

11. (a) Derive the expression for torque equation of a three phase induction motor and derive the condition for obtaining the maximum torque. **10**
- (b) Explain the no load and blocked rotor tests on an induction motor for determination of equivalent circuit parameters. **10**

OR

12. (a) Explain the steps to draw circle diagram for predicting the performance of a three phase induction motor. **10**
- (b) Describe the phenomenon :
- (i) cogging
- (ii) crawling in three phase induction motor and describe its remedial measures. **10**

Module – II

13. (a) A three phase, 6 pole, 50 Hz induction motor drawing 60 A at full load speed of 940 rpm develops a torque of 150 Nm. When the motor is directly connected to the main, it is drawing a current of 300A. Determine its starting torque and starting current if a star-delta starter is used. **10**
- (b) What is slip power? Explain with a neat circuit diagram, the principle of operation of any one Slip power recovery scheme. **10**

OR

14. (a) How will you analyse a double cage motor by equivalent circuit? Also explain the torque slip characteristics of double cage motor. **10**
- (b) Explain the different speed control methods of a three phase Induction motor. **10**



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Module – III

15. (a) Explain with a neat diagram, the principle of operation of a Switched reluctance motor. **10**
- (b) Explain with necessary diagrams, the construction and operation of linear induction motor. **10**

OR

16. (a) Explain with neat diagrams, the construction and operation of a Synchronous induction motor. **10**
- (b) Explain the construction features and principle of operation of universal motor. **10**

(3 × 20 = 60 Marks)

