

G 613

(Pages : 3)

Reg. No.....

Name.....

**B.TECH. DEGREE EXAMINATION, MAY 2014**

**Seventh Semester**

Branch : Electrical and Electronics Engineering

**ELECTRICAL MACHINES - III (E)**

(Old Scheme - Prior to 2010 Admissions)

[Supplementary]



Time : Three Hours

Maximum : 100 Marks

**Part A**

*Answer all questions.*

*Each question carries 4 marks.*

1. Explain the principle of operation of three-phase induction motor.
2. Explain Cogging and how is it eliminated.
3. Discuss the method of increasing the starting torque of slip ring induction motor.
4. Explain Cascading of induction motors.
5. Discuss the types of Induction generators.
6. Explain the principle of shaded pole motor.
7. What is a Universal motor? How is it reversed?
8. Write a note on reluctance motor.
9. Discuss the applications of Scharage motor.
10. Draw and explain the equivalent circuit of double cage induction motor.

(10 × 4 = 40 marks)

**Part B**

*Answer all questions.*

*Each question carries 12 marks.*

11. (a) Draw and explain the equivalent circuit of three-phase induction motor.  
(b) A three-phase, 50 Hz 4 pole, 18 kW induction motor has friction and windage losses of 2.5 percent of the output. The full load slip is 4%. Calculate the rotor input, shaft torque and the gross torque.

(6 + 6 = 12 marks)

Or



**Turn over**

12. A three-phase, 200 V, 3.73 kW star connected induction motor gave the following test results :

Test	Line voltage	Line current	Total input
No load	200 V	5 A	300 W
Blocked rotor	100 V	26 A	1600 W

Draw the circle diagram and find the following :

- Line current and power factor at full load.
  - Maximum torque and corresponding slip.
  - Maximum output and Maximum input.
- (12 marks)
13. (a) Explain rotor resistance starting and design of rotor resistance starter.
- (b) Discuss the various methods of speed control from stator side.

(6 + 6 = 12 marks)

Or

14. (a) Explain the performance of three-phase induction motor when single phasing occur during operation.
- (b) A 3-phase, 400 V, 6 pole, 15 hp delta connected induction motor runs at 960 r.p.m. on full load. If it takes 86 A direct starting, find the ratio of starting torque to full load torque with a star-delta starter. Full load efficiency and power factor are 85% and 0.86 respectively.
- (6 + 6 = 12 marks)
15. (a) Explain the working of single-phase induction motor using double revolving field theory.
- (b) Draw and explain the circle diagram of synchronous induction motor.

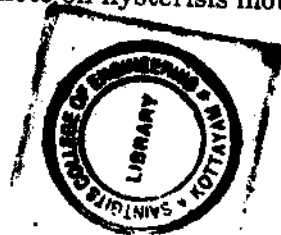
(8 + 4 = 12 marks)

Or

16. (a) Explain the different types of connection of rotor windings in synchronous induction motor. Compare their performance.
- (b) Draw and explain the torque slip curve of single-phase induction motor.
- (8 + 4 = 12 marks)
17. (a) Explain the construction and operation of Repulsion motor.
- (b) Write short note on hysteresis motor.

(8 + 4 = 12 marks)

Or



18. (a) With phasor diagram and circuit model, explain the operation of single-phase series motor.  
(b) Discuss the applications of Universal motors.

(8 + 4 = 12 marks)

19. (a) With phasor diagrams, explain the effect of injecting e.m.f. at various angles into secondary circuit of induction motor.  
(b) What is the need of tertiary winding in Schrage motor?

(8 + 4 = 12 marks)

*Or*

20. (a) Explain the construction and operation of Linear Induction motor.  
(b) What is a Compensated induction motor?

(8 + 4 = 12 marks)

[5 × 12 = 60 marks]

