ANNA UNIVERSITY COIMBATORE

B.E. / B.TECH. DEGREE EXAMINATIONS : DECEMBER 2009

REGULATIONS - 2007

FOURTH SEMESTER – ELECTRICAL & ELECTRONICS ENGINEERING

070280026 - SYNCHRONOUS & INDUCTION MACHINES

TIME : 3 Hours Max.Marks : 100

PART – A

(20 x 2 = 40 MARKS)

ANSWER ALL QUESTIONS

1. Write the equation for induced emf in an alternator?
2. Define voltage regulation of an alternator.
3. What do you meant by hunting in alternators?
4. Define pitch factor.
5. What are the inherent disadvantages of synchronous motor?
6. Define pull out torque in synchronous motor.
7. Why is a synchronous motor not self staring?
8. What are the uses of damper winding s in synchronous motor?
9. What is meant by magnetic induction?
10. Draw the torque slip characteristics curve of an induction motor.
11. What is cogging?
12. Why the air gap is kept minimum in induction motor?
13. Why is starter necessary to start a 3 phase induction motor?
14. What is meant by stator voltage control?
15. Draw the speed torque characteristics of rotor resistance control.
16. What are the types of slip power recovery scheme?
17. Name the motors used in ceiling fan and in lathes.
18. What are the classifications of single phase induction motor based on the method of starting?
19. List out four applications of shaded pole induction motor.
20. What is stepper motor?

PART - B

(5 x 12 = 60 Marks)

ANSWER ANY FIVE QUESTIONS

21. A 3 phase, 50Hz star connected 2000kA for a certain field excitation. With the same excitation, the open circuit voltage was 900V. The resistance between a pair of terminals was 0.12 Ω. Find the full load regulation at UPF and 0.8pf lagging. Draw the phasor diagrams.

22. a. Explain the methods of starting synchronous motor against high-torque loads. 6

b. Explain various torques associated with synchronous motor. 6

23. A 3ph, 400 V IM, gave the test readings:
No load test: 400 V, 1250W, 9A
SC test : 150V, 4KW, 38A
Draw the circle diagram, If the normal rating is 14.91 KW, find from the circle diagram the full load current and slip.

24. Explain briefly the various speed control schemes of induction motors.

25. a. What is the principle and working of hysteresis motor? 6

b. Explain the construction and working of stepper motor. 6

26. a. Describe the principle and construction of slow speed operation generator with neat diagram 6

b. Derive the emf equation of alternator. 6

27. Explain the double field revolving theory for operation of single phase induction motor.

28. A 3300V,10 pole ,50HZ three phase star connected induction motor has slip ring rotor resistance per phase =0.015 ohm and standstill reactance per phase =0.25 ohm .If the motor runs at 2.5 percent slip on full load.
Find.1) Speed of the motor 2) Speed at which the torque will be maximum
3) The ratio of maximum torque to full load torque.

*****THE END*****