ANNA UNIVERSITY COIMBATORE

B.E. / B.TECH. DEGREE EXAMINATIONS : MAY / JUNE 2010

REGULATIONS : 2007

THIRD SEMESTER : ECE

070120020 - ELECTROMECHANICAL ENERGY CONVERSION

TIME : 3 Hours **Max.Marks : 100**

PART – A

(20 x 2 = 40 MARKS)

ANSWER ALL QUESTIONS

1. Why series motor cannot be started without any load?
2. Write down the emf equation of a dc generator.
3. Where three point and four point starters recommended?
4. What is the condition for maximum efficiency of a dc machine?
5. Write down the emf equation of transformer
6. Give the conditions to be satisfied for parallel operation of transformer?.
7. Why transformer rating is expressed in terms of KVA?
8. What are the advantages of sumpner's test?
9. Why starter is necessary for an induction motor?
10. A 4 poles, 3Ø induction motor is connected to 50 HZ ac supply, if it is running at 1400 rpm find the slip.
11. List the difference between squirrel cage and slip ring rotor.
12. Why single-phase induction motor is not self-srarting.
13. List the difference between salient type and nonsalient type of rotor construction
14. What is synchronous condenser and it use?
15. What is hunting? How it can be eliminated.
16. What are V and inverted V curves?
17. What is a universal motors? Write two applications.
18. Mention the application of reluctance motor

19. Define detent torque.
20. What is hysteresis motor? Write two applications.

PART – B

(5 x 12 = 60 MARKS)

ANSWER ANY FIVE QUESTIONS

21. Explain the construction and working principle of dc machine with neat diagram

22. A 500V, shunt motor takes a total current of 5A when running unload. The resistance of armature circuit is 0.25Ω and the field resistance is 125Ω.calculate the efficiency and output when the motor is loaded and taking a current of 100A.also find the percentage change in speed from no load to full load.

23. (i) Derive the emf equation of a transformer.

    (ii) Write short notes on parallel operation of transformer

24. Develop an equivalent circuit for three phase induction motor. State difference between exact and approximate equivalent circuit.

25. Briefly explain the following starters

    (i) Autotransformer starter (6)

    (ii) Star delta starter. (6)

26. A 3300V, 3Ø star connected alternator has a full load current of 100A on short circuit a field current of 5A was necessary to produce full load current. The emf on open circuit for the same excitation was 900V.the armature resistance was 0.8Ω per phase. Determine the full load voltage regulation for (i) 0.8 pf lagging (ii) 0.8 pf leading

27. What are the methods used to determine the voltage regulation of alternator? Explain the synchronous impedance method.

28. What is stepper motor? What are the types of stepper motor? Briefly explain the Working principle of any one type of stepper motor.

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