Roll No								

B.E / B.Tech. (Full Time) DEGREE END SEMSESTER EXAMINATIONS, MAY / JUNE 2012

ELECTRICAL AND ELECTRONICS ENGINEERING BRANCH

EIGHTH SEMESTER

EE 9036 SPECIAL ELECTRICAL MACHINES

(REGULATIONS 2008)

Time: 3 Hours Max. Marks: 100

Answer ALL Questions

PART -A (10 x 2 = 20)

1. List out the types of permanent magnet materials used in PMBLDC motor.
2. A PMBLDC motor has torque constant of 0.12 Nm/A referred to DC supply. Find the no load speed when the motor is connected to a 48 V DC supply.
3. Tabulate the differences between the Permanent Magnet Excitation and Electromagnet Excitation.
4. Write down any four properties of Synchronous Reluctance Motor.
5. Draw the circuit of PWM type current control in Switched Reluctance Motor.
6. Compare the differences between Classic bridge converter and C -Dump converter in terms of Number of devices, Device ratings and drops in SRM.
7. Define the terms holding torque and detent torque.
8. A Hybrid VR stepping motor has 10 main poles which has 7 teeths per pole. If rotor has 60 teeth, calculate the step angle.
9. What are the various methods used to reduce the transformer emf in AC series motor?
10. What are the benefits of using linear motor as compared to rotating motors?

PART -B (5 x 16 = 80)

11. Explain the principle of operation of PMBLDC motor with neat diagram. And also explain how resultant torque is developed in three phase three pulse (half – wave) brushless DC motor with neat waveforms.
12. (a) Explain the flux density distribution in PMSM and derive the EMF equation with neat diagrams.

(OR)

(b) Explain the operating principles of synchronous reluctance motors with its merits and demerits.

13. (a) (i) Derive the reluctance torque and mechanical power developed in SRM. (8)

(ii) Explain the hard chopping control of SRM. (8)

(OR)

(b) Write short notes on:

(i) Inductance profile of SRM (8)

(ii) Asymmetric bridge converter (8)

14. (a) (i) Explain the following terms in stepper motor.

(a) Pull in torque

(b) Bifilar winding

(c) Response range and

(d) Stepping error (8)

(ii) A stepper motor has a step angle of 3°. Determine (a) resolution (b) number of steps required for the shaft to make 25 revolutions and (c) shaft speed, if the stepping frequency is 3600 pps. (8)

(OR)

(b) (i) Write short notes on dual voltage circuits. (8)

(ii) Explain the operation of Variable Reluctance stepper motor in Full step mode with neat diagrams. (8)

15. (a) Explain the operation of various types of Linear motors with neat diagram.

(OR)

(b) Explain the operation of Permanent magnet AC Motors with neat diagram.