

R 3326

B.E./B.Tech. DEGREE EXAMINATION, NOVEMBER/DECEMBER 2007.

Seventh Semester

(Regulation 2004)

Electrical and Electronics Engineering

EE 1001 — SPECIAL ELECTRICAL MACHINES

(Common to B.E. (Part Time) Sixth Semester Regulation 2005)

Time : Three hours

Maximum : 100 marks

Answer ALL questions

PART A — (10 x 2 = 20 marks)

1. What is Vernier motor?
2. Write down any two properties of synchronous reluctance motor.
3. What is holding torque in stepping motors?
4. What is Hybrid motor?
5. List out any four applications of switched reluctance motors?
6. What are the types of power controllers used for switched reluctance motors?

What are the types of permanent magnet DC motors?

What is permanent magnet DC commutator motor?

List out the differences between the PM brushless DC motors and PM synchronous motors.

10. What is meant by slotless motor?

PART B — (5 x 16 = 80 marks)

11. (a) (i) Explain the principle of operation and constructional features of synchronous reluctance motor. (9)

(ii) Explain the working of Vernier motor with a neat diagram (7)

Or

(b) (i) Explain circle diagram and torque-speed characteristics of synchronous reluctance motors. (9)

(ii) Explain the synchronous reactance of PM synchronous reluctance motor in detail. (7)

12. (a) Explain the construction and principle of operation of VR stepping motor in detail. (16)

Or

(b) (i) Write short notes about the drive circuits of stepping motors? (6)

(ii) Explain the principle of operation and constructional features of Hybrid motors in detail. (10)

13. (a) (i) Draw and explain the characteristics of SR motors in detail. (10)

(ii) Explain the "shaft position sensing" of SR motor. (6)

Or

(b) (i) Explain the constructional features of SR motors in detail. (9)

(ii) Explain the role of computers in the control of SR motors. (7)

14. (a) (i) Derive the Torque and EMF equations of the permanent magnet brushless DC motor. (10)

(ii) Explain the principle of operation of permanent magnet brushless DC motor. (6)

Or

(b) Explain the modes of operation of power controller for permanent magnet brushless DC motor with a neat diagram. (16)

15. (a) (i) Explain the principle of operation of permanent magnet synchronous motors in detail. (6)

(ii) Derive the EMF and torque equations of permanent magnet synchronous motors. (10)

Or

(b) Explain the microprocessor based control of permanent magnet synchronous motors with a neat block diagram and List out its advantages. (16)
