Reg. No. :

Question Paper Code : Q 2765

B.E./B.Tech. DEGREE EXAMINATION, NOVEMBER/DECEMBER 2009.

Seventh Semester

Electrical and Electronics Engineering

EE 1001 — SPECIAL ELECTRICAL MACHINES

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

(Regulation 2004)

Time : Three hours 　　　　　　　　　　　　　　　　Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. What are the types of rotor available in synchronous reluctance motor?

2. What is vernier motor?

3. Give the classification of stepper motor.

4. Define the term skewing.

5. Draw the speed — torque characteristics of switched reluctance motor.

6. List any four applications of switched reluctance motor.

7. What are the advantages of PMBL DC motor?

8. Give the expression for the emf and torque of a PMBL DC motor.

9. What is load commutation?

10. What is the magnitude of stator current in PMSM to achieve demagnetization?

PART B — (5 × 16 = 80 marks)

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

Or

(b) Explain the circle diagram and torque speed characteristics of synchronous reluctance motor.

12. (a) (i) Describe the operation of a variable reluctance type stepper motor. (8)

(ii) Draw and explain the torque pulse rate characteristics of a stepper motor. (8)

Or

(b) (i) Explain the working of hybrid motor with neat diagram. (10)

(ii) What is stepping angle? A VR stepper motor has 8 poles in the stator and they have five teeth in each pole. If the rotor has 50 teeth, calculate the step angle and resolution. (6)

13. (a) Describe the Hysterisis type and PWM type current regulator for one phase of a switched reluctance motor with relevant circuit diagrams.

Or

(b) With neat diagram, explain the microprocessor based control of switched reluctance motor.

14. (a) Explain the construction and principle of operation of PMBLDC motor with neat diagram.

Or

(b) Describe the operation of power controllers for PMBLDC motor with neat diagram.

15. (a) Explain the construction and performance of a permanent magnet synchronous motor with neat diagram.

Or

(b) Derive the emf and torque equations of permanent magnet synchronous motor.

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