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Question Paper Code : 60517

B.E./B.Tech. DEGREE EXAMINATION, NOVEMBER/DECEMBER 2016.

Seventh Semester

Electrical and Electronics Engineering

EE 2403/EE 73/10133 EEE 25 — SPECIAL ELECTRICAL MACHINES

(Regulations 2008/2010)

(Common to PTEE 2403 – Special Electrical Machines for B.E. (Part-Time) Sixth Semester – EEE – Regulations 2009)

Time : Three hours

Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. List the types of synchronous reluctance motors.
2. Give the difference between synchronous reluctance motor and switched reluctance motor.
3. Define the micro stepping mode of Stepper motor.
4. Name the various driver circuits used in stepper motor.
5. Enumerate the different power controllers used for the control of SRM.
6. Mention the different modes of operation of switched reluctance motor.
7. What is permeance coefficient?
8. Name the power controllers used in permanent magnet brushless D.C. motor.
9. Write torque and EMF equation of PM synchronous motor.
10. Write the significance of power controllers of permanent magnet synchronous motors.

PART B — (5 × 16 = 80 marks)

11. (a) (i) Draw the phasor diagram of synchronous reluctance motor. (4)
(ii) Explain the construction of radial and axial flux machines. Discuss the advantages and disadvantages of each construction. (12)

Or

- (b) Explain in detail, the operating principle and construction of synchronous reluctance motor with neat diagram. Derive the torque equation of synchronous reluctance motor. (16)

12. (a) With a neat block diagram, explain the microprocessor control of stepping motor. (16)

Or

- (b) Explain the working of single and multistack configured stepping motors. (16)

13. (a) Describe the constructional features of Rotary and Linear switched reluctance motors. (16)

Or

- (b) Explain the closed loop control of SRM using sensorless operation. (16)

14. (a) Discuss the hysteresis type current regulation of PMBLDC motor with neat diagram. (16)

Or

- (b) Analyze the operation of electronic commutator in PMBLDC motor with neat diagram. (16)

15. (a) Explain the construction and performance of a permanent magnet synchronous motor with neat diagram. (16)

Or

- (b) Derive the emf and torque equation of permanent magnet synchronous motor. (16)