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**Question Paper Code : 21411**

B.E./B.Tech. DEGREE EXAMINATION, MAY/JUNE 2013.

Seventh Semester

Electrical and Electronics Engineering

EE 2403/EE 73 – SPECIAL ELECTRICAL MACHINES

(Regulation 2008)

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. What is the function of drive circuit in stepping motor?
4. Define step angle in stepping motor.
5. Write the torque equation of switched reluctance motor?
6. Mention some position sensors used in switched reluctance motor?
7. Compare permanent magnet brushless D.C. Motor with permanent magnet synchronous motor .
8. What is commutation?
9. Define synchronous reactance in PMSM.
10. Draw the output phasor diagram of PMSM.

PART B — (5 × 16 = 80 marks)

11. (a) Describe the constructional features of Axial and radial flux synchronous reluctance motors. (16)

Or

- (b) Derive the voltage and torque equations of synchronous reluctance motor. (16)

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

Or

- (b) Explain the working of single and multistack configured stepping motors. (16)
13. (a) Describe the construction and working of rotary and linear switched reluctance motors. (16)

Or

- (b) Discuss the following in switched reluctance motor.
- (i) Methods of Rotor position sensing (8)
- (ii) Sensorless operation (8)
14. (a) Discuss the magnetic circuit analysis relevant to permanent magnet brushless D.C. Motor. Also draw the characteristics. (16)

Or

- (b) Illustrate the working of different types of power controllers used for the control of permanent magnet brushless D.C. Motors. (16)
15. (a) Write short notes on
- (i) Volt-ampere requirements in PMSM Motor. (8)
- (ii) Torque/speed characteristics in PMSM Motor. (8)

Or

- (b) Derive EMF and torque equations of permanent magnet synchronous motor.
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