



Reg. No. :

--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

0914
PN

Question Paper Code : 52509

B.E./B.Tech. DEGREE EXAMINATION, NOVEMBER/DECEMBER 2017

Seventh Semester

Electrical and Electronics Engineering

EE2403 – SPECIAL ELECTRICAL MACHINES

(Regulations 2008)

Time : Three Hours

Maximum : 100 Marks

Answer ALL questions

PART – A

(10×2=20 Marks)

1. Give some potential applications of synchronous reluctance machine.
2. Write the various design parameters of a synchronous reluctance motor.
3. Compare single stack and multistack configurations in stepping motors.
4. List the different modes of excitations in stepping motors.
5. Write the torque equation of switched reluctance motor.
6. What is the significance of position sensors used in switched reluctance motor?
7. Why Brushless Permanent Magnet (BLPM) DC motor is called as electronically commutated motor?
8. List down some important applications of BLPM DC 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) Describe in detail, the speed-torque and torque-angle characteristics of synchronous reluctance motors with phasor diagrams. (16)

(OR)

- b) Explain in detail with a neat diagram, the construction and working principle of synchronous reluctance motor. (16)



12. a) Explain with a neat diagram the microprocessor control of stepper motor. (16)
(OR)
b) Explain the working of drive circuits used to drive the stepping motor. (16)
13. a) Describe the construction and working of rotary and linear switched reluctance motor. (16)
(OR)
b) Discuss the following in switched reluctance motor.
i) Methods of Rotor position sensing. (8)
ii) Sensorless operation. (8)
14. a) i) What are the advantages of BLPM DC motor over conventional dc motor? (4)
ii) Derive the expression for permeance coefficient from the magnetic circuit analysis of permanent magnet brushless DC motor. (12)
(OR)
b) Derive the emf equation and torque equation of PMBL DC motor. (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)