Reg. No. : | | | | | | | | | | |

Question Paper Code: 37303

B.E. / B.Tech. DEGREE EXAMINATION, APRIL 2019

Seventh Semester

Electrical and Electronics Engineering

01UEE703 - SPECIAL ELECTRICAL MACHINES

(Regulation 2013)

Duration: Three hours Maximum: 100 Marks

Answer ALL Questions

PART A - (10 x 2 = 20 Marks)

1. Define Reluctance torque.
2. List out the primary design considerations of synchronous reluctance motor.
3. Define the term “Stepping – Angle”.
4. What is slew range?
5. What are advantages of Switched Reluctance Motors?
6. State about aligned an unaligned inductance and its effect in SRM.
7. Why rotor position sensors are needed in PMBLDC motor?
8. What are the applications of BLDC Motors?
9. What is meant by synchronous reactance?
10. Define Synchronous reluctance.

PART - B (5 x 16 = 80 Marks)

11. (a) Describe the axial and radial type rotor of synchronous reluctance motor. (16)

Or

(b) Draw and explain a typical Torque-Speed characteristics of synchronous Reluctance motor. (16)

12. (a) Describe the working of 3 stack stepper motor having 12 poles in the stator and the rotor. (16)

Or

(b) (i) With a neat sketch, explain the dynamic characteristics of stepper motor. (8)

(ii) Derive the expression for torque production in VR stepper motor. (8)

13. (a) Describe the various power controller circuits applicable to switched reluctance motor and explain the operation of any one scheme with suitable circuit diagram. (16)

Or

(b) What are the basic requirements of power controller in switched reluctance motor? Explain the C-dump power controller circuit for Switched Reluctance Motor. (16)

14. (a) Explain construction and working principle of PMBLDC motor. (16)

Or

(b) Explain the various power controller circuits for permanent magnet brushless DC motor with neat sketch. (16)

15. (a) (i) Explicate with Phasor diagram of PM synchronous Motor. (8)

(ii) Draw and give explanation about the speed torque characteristics of PM synchronous motor. (8)

Or

(b) Explain in detail, about microprocessor based control of permanent magnet synchronous motor. (16)