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

Question Paper Code: 37303

B.E. / B.Tech. DEGREE EXAMINATION, NOV 2018

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. What are the primary design considerations of synchronous reluctance motor?
2. State the disadvantages of synchronous reluctance motor.
3. Define slewing in stepper motor.
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 the PMBLDC motor is called electronically commutated motor?
8. What are the advantages of BLDC Motors?
9. What is meant by synchronous reactance?
10. Define Synchronous reluctance.

PART - B (5 x 16 = 80 Marks)

11. (a) Draw the phasor diagram of synchronous reluctance motor and explain. Also discuss the speed torque characteristics. (16)

Or

(b) (i) Draw and explain a typical Torque-Speed characteristics of synchronous Reluctance motor. (12)

(ii) Explain the working principle of Vernier motor. (4)

12. (a) Enlighten the various modes of excitation of Hybrid stepping motor with excitation table. (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) Derive the expression for frequency of variation of inductance of switched reluctance motor. (16)

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

Or

(b) Derive the Torque and EMF equations of the permanent magnet brushless DC Motor. (16)

15. (a) (i) Draw and describe torque speed characteristics of PMSM. (8)

(ii) Explain the role of PMSM in wind energy system. (8)

Or

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