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**Question Paper Code: 31373**

B.E. / B.Tech. DEGREE EXAMINATION, MAY 2017

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 is saliency ratio of Synchronous Reluctance Motors?
2. State the advantages of synchronous reluctance motor.
3. List the classifications of Stepper motors.
4. How will you define Step angle?
5. What are advantages of Switched Reluctance Motors?
6. State about aligned and 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 are the features of PMSM?
10. Why PMSM operating in self-controlled mode is known as commutatorless dc motor?

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 make clear the phasor diagram of synchronous reluctance motor. (16)

12. (a) Enlighten the various modes of excitation of VR 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) Explicate the constructional feature and principle of operation of switched reluctance motor. (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) (i) Give the difference between mechanical and electronic commutator. (6)

(ii) Derive the expression for EMF and Torque equations of a PMBLDC. (10)

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 microprocessor based control of PM synchronous motor. (16)