

Subject Code: C4307/R09

M. Tech – I Semester Supply Examinations, April, 2015

SPECIAL MACHINES AND CONTROLS

(Common to PE, PE&D, PE&ED, P&ID, PE&PS and EM&D)

Time: 3 Hours

Max Marks: 60

Answer any FIVE questions

All questions carry EQUAL marks

1. a) What is a step angle? Explain
b) Define stepping rate of a stepper motor.
c) Calculate the stator pole pitch, rotor pole pitch and full step angle of a 12/8 VR stepper motor.
2. a) Differentiate between unifilar windings and bifilar windings.
b) With a block diagram, explain the open loop control of a stepper motor.
3. What is the reason for torque ripples in switched reluctance motors? With a block diagram, explain in detail the torque control of a switched reluctance motor.
4. What is a commutator? What is its need in electrical machines? Compare between mechanical and electronic commutators.
5. a) Prove that the PM BLDC machines have 15% more power density than the PMSM.
b) What are current controllers? Explain hysteresis current control scheme.
6. a) Compare between stepper motors and servo motors.
b) List different types of servo motors.
7. Explain the operating principle of AC tachometer. Also discuss the use of AC tachometers.
8. a) Compare between DC Linear motor and Linear Induction motor.
b) Define and explain Goodness factor.
c) List different applications of Linear motors.

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