

**Subject Code: H4308/R13**

**M. Tech –II Semester Regular/ Supply Examinations, October, 2015**

**SPECIAL MACHINES**

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

**Time: 3 Hours**

**Max Marks: 60**

**Answer any FIVE questions**

**All questions carry EQUAL marks**

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1. a) What is a step angle? How to calculate step angle?  
b) Calculate the stator pole pitch, rotor pole pitch and full step angle of a 12/8 VR stepper motor.
2. a) What is the need for closed-loop control of stepper motors? Also compare closed-loop control with open-loop control.  
b) Draw the block diagram and explain the open-loop control of stepper a motor.
3. What are different merits of Permanent Magnet Synchronous Motors (PMSM)? Explain the vector control of PMSM.
4. 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.
5. What are the merits of brushless DC motors? With a neat block diagram, explain the closed loop control of a BLDC motor.
6. a) What are current controllers? Explain hysteresis current control scheme  
b) Prove that the PM BLDC machines have 15% more power density than the PMSM.
7. a) Explain different applications of servo motors.  
b) Explain the principle of operation of AC servo motor.
8. a) Explain different types and applications of linear motors.  
b) Discuss the application of Linear Induction Motors for electric traction.

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