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

Question Paper Code: 52531

M.E. DEGREE EXAMINATION, NOV 2016

Third Semester

Power Electronics and Drives

15PPE301 – SPECIAL ELECTRICAL MACHINES AND CONTROLLERS

(Regulation 2015)

Duration: Three hours Maximum: 100 Marks

Answer ALL Questions

PART A - (5 x 1 = 5 Marks)

1. Which material is used for making Hall IC pallet?

   (a) Antimony (b) Aluminium
   (c) Indium (d) Both (a) and (c)

2. Mention the type of rotors available in PMSM motor

   (a) Interior (b) Projected (c) Transverse (d) Both (a) and (c)

3. A switched reluctance motor differs from a VR stepper motor in the sense that it

   (a) has rotor poles of ferromagnetic material
   (b) rotates continuously
   (c) is designed for open-loop operation only
   (d) has lower efficiency

4. VR stepper motor has

   (a) High inertia (b) Low inertia
   (c) Medium inertia (d) None of these

5. Hysteresis motor is a

   (a) Single phase motor (b) Two phase motor
   (c) Three phase motor (d) None of these

PART B - (5 x 3 = 15 Marks)

6. List the permanent magnet materials.

7. What are the applications of PMSM?

8. List the disadvantages switched reluctance motor?

9. List the various types of stepper motor.

10. Define linear motor.

PART C - (5 x 16 = 80 Marks)

11. (a) What are the types of materials used in PMDC motors? (16)

Or

(b) Draw the B-H hysteresis loop of permanent magnet material. (16)

12. (a) Derive torque and EMF equation of PMSM. (16)

Or

(b) Compare the constructional features of axial and radial air gap synchronous reluctance motor. (16)

13. (a) Explain the construction and working principle of SRM. (16)

Or

(b) Explain the importance of closed loop control in switched reluctance motor. (16)

14. (a) With a neat sketch explain the construction working principle of PM stepper motor. (16)

Or

(b) Derive the torque equation of VR stepper motor. (16)

15. (a) Describe the principle of operation of hysteresis motor and also draw its characteristics. (16)

Or

(b) Describe the principle of operation of AC series motor and mention its applications. (16)