Year/Sem	: IV/VII	Duration	: 3Hrs
Section	: B	Staff in charge	: Mr.M.Kaliamoorthy

PART A   **Answer ALL Questions**   **10 X 2 =20**

1. What is vernier motor?
2. Write down any two properties of synchronous reluctance motor?
3. What is holding torque in stepping motors?
4. What is Hybrid motor?
5. List out any four applications of switched reluctance motors?
6. What are the types of power controllers used for switched reluctance motors?
7. What are the types of permanent magnet DC motors?
8. List out the differences between the PM brushless DC motors and PM synchronous motors?
9. Draw the torque speed characteristic of sine wave motor.

10. Why the PMSM is called as sine wave motor?

PART B   **Answer any ONE FULL question from each part**   **5 X 16 = 80**

11. (a) (i) Explain the principle of operation and constructional features of synchronous reluctance motor?
(9)
    (ii) Explain the working of vernier motor with a neat diagram?   (7)

OR

(b) (i) Explain circle diagram and torque-speed characteristics of synchronous reluctance motors. (9)
  (ii)Explain the synchronous reactance of PM synchronous reluctance motor in detail.   (7)

12. (a) Explain the construction and principle of operation of VR stepping motor in detail.   (16)

OR

  (b) (i) Write short notes about the drive circuits of stepping motors?   (6)
    (ii)Explain the principle of operation and constructional features of Hybrid motors in detail. (10)

13. (a) (i)Explain the constructional features of SR motors in detail.   (9)
    (ii)Explain the role of computers in the control of SR motors.   (7)

OR

  (b) (i) Explain at least two converter circuits for the control of SRM.   (8)
    (ii) Explain the speed torque characteristics   (8)

14 (a) (i) Derive the torque and EMF equations of the permanent magnet brushless DC motor.   (10)
    (ii)Explain the principle of operation of permanent magnet brushless DC motor.   (6)

OR

(b) (i) A BLDC motor has a no load speed of 6000RPM when connected to 120 V supply. The armature
    resistance is 2.5 Ω. Rotational and iron losses may be neglected. Determine the speed when the supply
    voltage is 60V and the torque is 0.5Nm. No load speed when supply voltage is 120 Volts is 6000
    RPM.   (6)
    (ii) Compare and explain the mechanical commutator and brushes arrangement with that of the
      electronic commutator with neat diagrams   (10)

15. (a) (i)Explain the principle of operation of permanent magnet synchronous motors in detail.   (6)
(ii) Derive the EMF and torque equations of permanent magnet synchronous motors.   (10)

OR

  (b) Explain the microprocessor based control of permanent magnet synchronous motors with a neat
block diagram and list out its advantages.   (16)