**EEE-012 : SPECIAL ELECTRICAL MACHINES**

UNIT-1

1. In deep –bar rotor poly phase IM, explain how the skin effect phenomenon is helpful in attaining desirable features of high starting torque & low Operating slip (2011)
2. Explain how the equivalent circuit of an ordinary poly phase induction motor is also applicable to deep- bar induction motor.(2011)
3. In double cage poly phase induction motor, explain how the desirable features of high starting torque & low operating slip are attained. (2011)
4. Explain double field revolving theory.
5. Explain why single phase induction motor is not self starting.
6. Explain starting method of single phase induction motor.
7. Explain shaded pole motor with neat sketch.
8. Explain working of stepper motor.
9. Explain construction of single phase AC servo motor.
10. Explain why a single IM , as compared to a 3 phase IM , has larger slip, less efficiency & more noise (2011)
11. A 3 phase IM, driving a constant torque load is connected to constant frequency voltage source. For this explain the with reduction in supply voltage , the stator current increases. (2011)
12. Discuss the phenomenon of single phasing when applied to the 3 phase IM , designed for continuous working . Explain the difference in behavior when the single phasing occurs in the primary & the secondary windings. (2011)

UNIT-2

1. The following data relates to tests on a 110volts,150 watts,50 Hz, 6-pole, Single phase induction motor:  
   No load test: 110 volts, 63 watts, 2.7A  
   Blocked rotor test: 55 volts, 212 watts, 5.8 A  
    Stator winding resistance is 2.5Ω & during the blocked rotor test, the Starting winding is open. Determine the equivalent circuit parameter.
2. For a single phase induction motor give the qualitative explanation for the   
   Following   
   (i) Behavior of the motor with its rotor at stand still & with only main winding is excited.  
   (ii) The forward flux wave is several times greater than the backward flux wave at normal speed, but they are equal at stand still.
3. Enumerate the merits & demerits of an ac servo motor as compared to other servomotor. Also explain construction & operation of two phase ac Servo motor.
4. State & describe the method of starting of single phase induction motor. Explain how a rotating magnetic field is produced in each one of them at the time of starting.(2012)
5. Discuss the static slip recovery control scheme for three phase IM with neat sketch. (2012)

Unit-3

1. Explain the construction & principle of operation any two of the following motors.   
   (i) Variable reluctance stepper motor.  
   (ii) Permanent magnet stepper motor.  
   (ii) Hybrid stepper motor.
2. Explain the construction & principle of operation of SRM in detail also mention it’s application.

Unit-4

1. Discuss the brushless DC motor with their important features & with the help of suitable application. 2012
2. Discuss in detail , the construction , operating principle & characteristic of reluctance hysteresis motor. (2012)
3. Describe a 3-ø , 3-pulse brushless DC motor. Discuss how torque is developed in this motor. In case phase current are assumed to vary sinusoidally show that output torque is independent of rotor angular position
4. Describe the construction of a permanent-magnet DC motor. What are the advantages & disadvantages of permanent magnet DC motors compared with conventional shunt DC motor
5. What types of permanent-magnet materials are used for permanent-magnet DC motors? State their properties & applications.

Unit-5

1. Discuss in detail the construction, principle of operation & characteristics of repulsion motors with neat diagram & application also. (2012)
2. Explain in detail the construction & working principle of linear induction motor also mention it’s application. Also derive an expression for the linear force in terms of specific loading & linear dimension. (2012)
3. Write short notes on any two of the following:   
   (i) Universal motor   
   (ii) 1-ф hysteresis motor  
   (iii) Shaded pole motor (2012)
4. Sketch the stator current variation from low impedance position to high Impedance position. Hence show the torque variation of the repulsion motor on the same sketch