**QUESTION BANK**

**EE2403 - SPECIAL ELECTRICAL MACHINES**

**UNIT I**

**SYNCHRONOUS RELUCTANCE MOTOR**

**PART A**

1. What is a Synchronous Reluctance Motor?

2. What are the types of Synchronous Reluctance Motor?

3. State the principle of operation of Synchronous Reluctance Motor.

4. State any advantages of Synchronous Reluctance Motor.

5. List the applications of Synchronous Reluctance Motor.

6. Define torque angle.

7. Write Torque equation of a synchronous reluctance motor.

8. Write down the important features of Vernier Motor.

9. Define reluctance torque.

10. What is meant by flux concentrating and flux focusing?

11. What are the factors to be considered while designing a Vernier motor?

12. What is meant by axial flux motor?

13. Write the various design parameters of a synchronous reluctance motor.

14. Give the difference between synchronous reluctance motor and switched reluctance motor

15. Write voltage equation of a synchronous reluctance motor.

16. Difference between axial type and radial type synchronous reluctance motor.

17. Draw the torque-speed characteristic of synchronous reluctance motor.

18. List out any four properties of Synchronous Reluctance Motor.

19. State any disadvantages of synchronous reluctance motor.

20. Draw the torque angle characteristic of synchronous reluctance motor.

**PART B**

1. Explain the constructional features of synchronous reluctance motor. (16)
2. Explain the operating principle of synchronous reluctance motor. (16)
3. Explain the torque-speed characteristics of synchronous reluctance motor (16)
4. Explain the synchronous reactance of PM Synchronous reluctance motor. (16)
5. Describe the constructional details and working principle of Synchronous Reluctance motor (16)
6. Draw and explain a typical torque-speed, torque angle characteristic of a Synchronous Reluctance motor with Phasor diagram (16)
7. Derive the expression for the d –axis PM Synchronous Reluctance Motor. (8)
8. Distinguish between Axial and Radial air gap motor. Compare the performance with SRM (16)
9. Explain the constructional features of synchronous reluctance motor and explain its characteristics, Also draw the phasor diagram (16)
10. Derive voltage and torque equation of synchronous reluctance motor (16)

**UNIT II**

**STEPPING MOTOR**

**PART A**

1. What is a stepper motor?

2. What are the main features of stepper motor which are responsible for its wide spread use?

3. Name the different types of stepper motor.

4. Define slewing.

5. What is a slewing rate?

6. What is synchronism in stepper motor?

7. What is variable reluctance stepper motor?

8. What is Permanent Magnet Stepper Motor?

9. What is Hybrid Stepper Motor?

10. What is meant by micro stepping in stepper motor?

11. What are the advantages and disadvantages of VR Stepper motor?

12. What are the advantages and disadvantages of PM Stepper motor?

13. What are the advantages and disadvantages of Hybrid Stepper motor?

14. What are the different types of drive circuits for stepper motor?

15. Name the various modes of excitation in stepping motor.

16. What is the function of drive circuit in stepping motor?

17. What is logic sequencer?

18. Define step angle in stepper motor.

19. Mention the application of stepper motor.

20. Draw the block diagram of the drive systems of stepping motor

**PART B**

1. With neat diagram explain microprocessor control of steeping motor (16)

2. Discuss dual voltage driver circuit for two phase on drive of a four phase stepper motor and explain the nature of current build up in dual voltage drive (16)

3. Explain the working of Hybrid Motor with neat diagram. (16)

4. What is stepping angle? A VR Stepper Motor has 8 poles in the stator and they have five

teeth in each pole. If the rotor has 50 teeth, calculate the step angle and resolution. (16)

5. Write short notes about the drive circuits of stepping motor? (8)

6. Explain the constructional features of Hybrid Motor in detail. (16)

7. Explain the construction and principle operation of VR Stepping Motor (8)

8. Explain the working of single configured stepping motor (16)

9. Explain torque versus stepping rate characteristics of a stepper motor. Also explain about

slew range and ramping. (16)

10. Explain the working of multi stack configured stepping motor (16)