



CBCS SCHEME

17EE554

Fifth Semester B.E. Degree Examination, July/August 2021 Special Electrical Machines

Time: 3 hrs.

Max. Marks: 100

Note: Answer any FIVE full questions.

- 1 a. Describe the construction and working of four phase , eight pole single stock variable reluctance motor in full step ON mode. (10 Marks)
b. Sketch and explain the static and dynamic characteristics of stepper motor. (10 Marks)
- 2 a. Derive the torque equation of a variable reluctance stepper motor. (08 Marks)
b. With the help of block diagram, explain the open loop and closed loop control scheme for stepper motor. (08 Marks)
c. Write the applications of Stepper motor. (04 Marks)
- 3 a. With the help of block diagram, explain Sensorless control scheme. (06 Marks)
b. Explain the working of four phase eight pole switches reluctance motor. (08 Marks)
c. With schematic diagram, explain the current regulators. (06 Marks)
- 4 a. Compare Mechanical and Electronic Commutators. (06 Marks)
b. Compare conventional DC motor and BLDC motor. (06 Marks)
c. Explain the construction of Permanent Magnet DC Motor (PMDC). (08 Marks)
- 5 a. Derive the emf equation of a Permanent Magnet Synchronous Motor (PMSM). (10 Marks)
b. Obtain the torque equation of Permanent Magnet Synchronous Motor (PMSM). (10 Marks)
- 6 a. Compare Conventional synchronous motor with permanent magnet synchronous motor. (06 Marks)
b. Explain the construction and working of Synchronous Reluctance Motor (SyRM). (08 Marks)
c. Derive the torque equation of Synchronous Reluctance Motor (SyRM). (06 Marks)
- 7 a. Derive the emf and torque equations of AC series motor. (10 Marks)
b. Explain the working of hysteresis motor. (10 Marks)
- 8 a. Describe the various speed control schemes for Universal motor. (10 Marks)
b. With neat diagrams, explain the constructional details of DC screw motor. (10 Marks)
- 9 a. Derive the thrust equation of Linear Induction Motor. (08 Marks)
b. What are the advantages of Linear Motors compared with rotating motors? (06 Marks)
c. Write the advantages of Permanent magnet axial flux machine compared with a Permanent magnet Radial flux machine. (06 Marks)
- 10 a. Derive Torque and EMF equations of Permanent Magnet Axial Flux Machines. (10 Marks)
b. Derive the output equation of Permanent Magnet Axial Flux Machines. (10 Marks)

Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.
2. Any revealing of identification, appeal to evaluator and /or equations written eg. 42+8=50, will be treated as malpractice.

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