

Code No: RT42022C

R13

Set No. 1

IV B.Tech II Semester Supplementary Examinations, July/August - 2017

SPECIAL ELECTRICAL MACHINES

(Electrical and Electronics Engineering)

Time: 3 hours

Max. Marks: 70

Question paper consists of Part-A and Part-B

Answer ALL sub questions from Part-A

Answer any THREE questions from Part-B

PART-A (22 Marks)

1. a) Define and explain Coenergy. [3]
- b) Find the stator pole pitch, rotor pole pitch and full step angle of a 12/8 Variable Reluctance stepper motor. [4]
- c) Differentiate between DC motors and PMDC motors. [4]
- d) Differentiate between DC motors and BLDC motors. [4]
- e) List different types of linear motors. [3]
- f) Discuss the properties of traction drives. [4]

PART-B (3x16 = 48 Marks)

2. a) Discuss the advantages and disadvantages of Switched Reluctance Motors. Also list some of their applications. [8]
- b) Define Stroke angle of an SRM. Calculate stroke angle of a 4-phase 8/6 SRM. [4]
- c) Why the stator pole arc angle is less than the rotor pole arc angle? Explain. [4]
3. a) Define step angle, stator pole pitch and rotor pole pitch of a stepper motor. [8]
- b) Describe principle of operation of a stepper motor. List various applications of stepper motor. [8]
4. a) With a constructional diagram, explain the working of permanent magnet DC motors. [8]
- b) Explain the working of moving coil motors. [8]
5. a) What is the need for sensors in the control of BLDC motors? Explain. [6]
- b) With a block diagram, explain the sensorless control of BLDC motor. [10]
6. a) Discuss the construction and principle of operation of linear synchronous motor. [10]
- b) Discuss various industrial applications of linear motors. Also mention the merits of using linear motors for these applications compared to rotary motors. [6]
7. a) Compare between AC drives and DC drives for traction application. [8]
- b) Discuss the application of linear motors for traction. [8]