

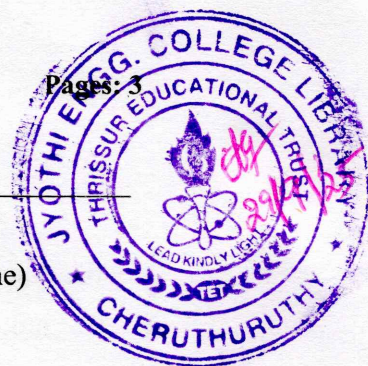
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Reg No.: _____

Name: _____

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY
B.Tech Degree S8 (S) Examination September 2025 (2019 Scheme)



Course Code: EET426

Course Name: SPECIAL ELECTRIC MACHINES

Max. Marks: 100

Duration: 3 Hours

PART A

Answer all questions, each carries 3 marks.

Marks

- | | | |
|----|---|-----|
| 1 | Explain the working of Permanent Magnet Synchronous Motor. | (3) |
| 2 | List the applications of Permanent magnet DC motors. | (3) |
| 3 | Define step angle and resolution. | (3) |
| 4 | Explain the pull-in and pull-out characteristics of stepper motors with neat sketches. | (3) |
| 5 | With neat diagram explain the torque Speed characteristics of Synchronous Reluctance Motor. | (3) |
| 6 | Explain the various sources of noise in Switched Reluctance Motors. | (3) |
| 7 | Compare AC servomotor and DC servomotors. | (3) |
| 8 | What are the different types of damping in AC servomotors? | (3) |
| 9 | Draw the equivalent circuit and the phasor diagram of AC Series motor. | (3) |
| 10 | Explain the Transverse edge effects in Linear Induction Motors. | (3) |

PART B

Answer any one full question from each module, each carries 14 marks.

Module I

- 11 a) With neat diagram explain the control schemes for Permanent Magnet Synchronous motor. (10)

- b) Mention the advantages and disadvantages of Permanent Magnet Brushless DC motors (4)

OR

- 12 a) Explain the principle of operation of Permanent magnet Brushless DC motors for 180° commutation with neat diagram. (14)

Module II

- 13 a) Explain Multistack Variable Reluctance Stepper Motor. (10)
- b) A stepper motor is designed to have three phase and six poles. If it has 10 rotor teeth. Find its resolution. (4)

OR

- 14 a) With neat diagrams describe the modes of operation of Permanent Magnet Stepper Motors. (14)

Module III

- 15 a) Explain the Construction and working of Synchronous Reluctance motors. (14)

OR

- 16 a) Explain any three power converter circuits for switched reluctance motors. What are the requirements of power converter circuit? (14)

Module IV

- 17 a) Derive the transfer function of the field controlled DC Servomotor. (9)
- b) Compare field controlled and armature controlled DC servomotor. (5)

OR

- 18 a) Explain the principle of operation of AC servomotor with neat diagram. (10)

- b) What are the requirements of a good servomotor? (4)

Module V

- 19 a) Derive the thrust equation for Linear Induction motors. (10)
b) Define goodness factor of LIM with equations. (4)

OR

- 20 a) With neat diagram explain the construction and working of universal motors. (10)
b) List the applications of Linear Synchronous motor. (4)
