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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 180^0 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)

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