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Reg No.:_____ Name:_____

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY

EIGHTH SEMESTER B.TECH DEGREE EXAMINATION, MAY 2019

Course Code: EE402

Course Name: Special Electrical Machines

Max. Marks: 100 Duration: 3 Hours

PART A

Answer all questions, each carries 5 marks. Marks

1		Draw and explain the Torque speed curves of an AC servomotor for various values of control voltage	(5)
2		Define Step angle and detent torque for a Stepper motor.	(5)
3		Explain working principle of two–pole single-phase AC series motor with diagram.	(5)
4		Explain why rotor position sensor is required for the operation of switched reluctance motor.	(5)
5		What are the advantages of PMBLDC motor over DC motor?	(5)
6		Differentiate trapezoidal type BLDC motor and sinusoidal type PMBLDC motor	(5)
7		Enumerate linear motors and list any four applications.	(5)
8		Write short note on linear induction motor.	(5)

PART B

Answer any two full questions, each carries 10 marks.

9	a)	Explain the types of series split field DC servomotor.	(4)
	b)	With relevant diagrams explain field controlled DC Servomotors	(6)
10	a)	Explain any two modes of excitation used in three phase permanent magnet stepper motor.	(5)
	b)	Explain the construction of multi stack Variable reluctance stepper motor with neat sketches.	(5)
11	a)	Compare the performance of AC and DC servo motors and list the applications.	(6)
	b)	Define the following terms as applied to a Stepper motor (1) Start-stop mode (2) Slewing mode.	(4)

PART C

Answer any two full questions, each carries 10 marks.

12	a)	Draw the phasor diagram of AC series motor and derive the voltage equation	(5)
	b)	Derive the torque equation of hysteresis motor	(5)

13 a) With neat sketches explain the construction and operation of 6/4 SRM (10)

14 a) Write short notes on the principle of hysteresis motor with necessary diagrams (5)

b) Draw and explain n+1 switches and diode configuration power converter for SRM. (5)

PART D

Answer any two full questions, each carries 10 marks.

15 Explain the principle of operation of PMBLDC motor for 120^0 commutation with neat circuit diagram. (10)

16 With necessary diagrams explain Longitudinal flux linear switched reluctance motor and Transverse flux linear switched reluctance motor. (10)

17 a) Draw and explain the performance characteristics of PMBLDC motor. (6)

b) Derive the expression for linear force. (4)

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