Reg No.:_____ Name:_____

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY

Eighth Semester B.Tech Degree Supplementary Examination October 2022 (2015 Scheme)

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		What is meant by Servo motors? Explain a DC Servo motor. What are the basic features of Servo motors that helps to achieve good dynamic response	(5)
2		Define step angle and detent torque in Stepper motors.	(5)
3		Can we use DC series motor in AC supply? If so explain the modifications required to work satisfactorily in ac supply.	(5)
4		Describe any one power converter circuit for Switched Reluctance motor.	(5)
5		Give the constructional details of a Permanent Magnet DC Motor	(5)
6		Differentiate between trapezoidal type BLDC motor and sinusoidal type BLDC motor.	(5)
7		Explain the operation of any one type of Linear Synchronous motor.	(5)
8		List the applications of Linear Induction motor.	(5)

PART B

Answer any two full questions, each carries 10 marks.

9	a)	Draw and explain torque speed characteristics of AC Servomotor for different values of control voltage.	(5)
	b)	Enumerate features of AC Servomotor. List four applications of AC Servomotor.	(5)
10	a)	Explain series split field DC Servomotors with necessary diagram.	(5)
	b)	Sketch and explain static and dynamic characteristics of Stepper motors.	(5)
11		Describe the working of Variable Reluctance Stepper motor in two phase on mode with relevant sketches.	(10)

PART C

Answer any two full questions, each carries 10 marks.

12	a)	(i) What is an AC series motor? Explain with any one application. (ii) Develop the phasor diagram of AC series motor.	(5)
	b)	What are the advantages and limitations of Universal motor.	(5)

13 a) Derive the torque equation of Hysteresis motor. (5)

b) Name two rotor position sensing schemes used in the operation of Switched Reluctance Motor. Discuss them in detail. (5)

14 Derive the torque equation of SRM. Also list four applications of SRM. (10)

PART D

Answer any two full questions, each carries 10 marks.

15 a) Explain the operation of BLDC motor with relevant sketches. Give any two applications of BLDC motors. (10)

16 a) Compare Electronic commutation and mechanical commutation. (5)

b) Explain the working of a Linear Reluctance Motor. (5)

17 a) Explain the principle of operation of Linear Induction Motor. (5)

b) Develop the equivalent circuit of Linear Induction Motor. (5)

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