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Reg No.:_____ Name:_____

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY

B.Tech Degree S8 (S, FE) / S6 (PT) (S, FE) Examination June 2023 (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		Explain the working of Series split field DC servomotors.	(5)
2		Differentiate between monofilar and bifilar windings of stepper motor.	(5)
3		Explain the principle of operation of universal motor.	(5)
4		Explain any one power converter circuit for Switched Reluctance motors.	(5)
5		What are the advantages and disadvantages of Brushless DC motor?	(5)
6		Explain the working of a Permanent Magnet DC motor with neat diagram.	(5)
7		Discuss the principle of working of linear synchronous motor.	(5)
8		Describe the equivalent circuit diagram of linear induction motor.	(5)

PART B

Answer any two full questions, each carries 10 marks.

9		Explain the working of armature controlled and field controlled d.c. Servomotors with neat diagrams.	(10)
10	a)	List the applications of ac servo motors.	(5)
	b)	Explain the dynamic characteristics of a stepper motor.	(5)
11		Explain any two modes of excitation used in three phase permanent magnet stepper motor.	(10)

PART C

Answer any two full questions, each carries 10 marks.

12		Explain the working of a Hysteresis motor and derive its torque equation.	(10)
13	a)	Discuss the basic principle behind the operation of a Switched Reluctance motor?	(5)
	b)	Explain the working principle of a AC series motor.	(5)
14		Derive the torque equation of a switched reluctance motor and draw the torque slip characteristics.	(10)

PART D

Answer any two full questions, each carries 10 marks.

15		Explain the working of a Brushless DC motor with a neat connection diagram and explain how unidirectional torque is developed by the machine. List its applications.	(10)
16	a)	What are the advantages and disadvantages of Brushless DC motor?	(5)
	b)	Explain the principle of operation of linear reluctance motors.	(5)
17		With necessary diagrams compare the construction and working of permanent magnet linear synchronous motor with active reaction rail and passive reaction rail.	(10)

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