Reg No.:_____ Name:_____

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY

Eighth semester B.Tech degree examinations, September 2020

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 a drag cup servo motor? What is its significance?	(5)
2	With the help of a diagram, explain the construction and working of Hybrid type stepper motor.	(5)
3	Draw and explain the phasor diagram of an AC series motor.	(5)
4	Explain the torque slip characteristics of a Reluctance motor.	(5)
5	Explain the constructional details of Permanent Magnet DC Motor with relevant diagrams.	(5)
6	List any five applications of Brushless DC motors.	(5)
7	Write short note on Linear Reluctance Motor.	(5)
8	Explain the working principle of a Linear Synchronous Motor.	(5)

PART B

Answer any two full questions, each carries 10 marks.

9	a)	Enumerate the features of DC servo motor. List two applications of DC servo motors.	(5)
	b)	Explain the operation of armature controlled DC servomotor with circuit diagram.	(5)
10	a)	Explain the principle of operation of an AC Servomotor with the help of a block diagram.	(5)
	b)	Describe a unipolar drive circuit for a Permanent Magnet stepper motor.	(5)
11	a)	Draw and explain Static and Dynamic characteristics of a stepper motor.	(5)
	b)	Explain the construction of multi stack Variable Reluctance Stepper motor with the help of neat sketches.	(5)

PART C

Answer any two full questions, each carries 10 marks.

12		Give the constructional details and working principle of a hysteresis motor.	(10)

Derive its torque equations and explain its torque-slip characteristic.

13	a)	Why is compensating winding required in an AC Series motor? Explain the two ways of providing compensating winding.	(5)
	b)	Derive the torque equation of a Reluctance motor.	(5)
14	a)	Draw and explain any two power converter circuits for Switched Reluctance motors.	(6)
	b)	What are the advantages of Switched Reluctance Motor?	(4)

PART D

Answer any two full questions, each carries 10 marks.

15	a)	Differentiate between trapezoidal type and sinusoidal type PMBLDC motor	(5)
	b)	Derive the expression for force of linear induction motor.	(5)
16	a)	Explain the construction and principle of operation of a Permanent Magnet DC Motor. Compare it with an ordinary dc motor.	(6)
	b)	Compare Mechanical and Electronic Commutation.	(4)
17		Draw and explain the working principle of Linear Induction Motor. Also develop its equivalent circuit.	(10)

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