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APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY

B.Tech Degree S8 (S,FE) Examinations September 2026 (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		What are the different types of permanent magnets used in BLDC motors?	(3)
2		Explain the principle of operation of BLDC motor.	(3)
3		Draw and explain the dynamic characteristics of the stepper motor.	(3)
4		Distinguish between monofilar and bifilar windings.	(3)
5		Why rotor position sensors are used in SRM?	(3)
6		Explain how reluctance torque depends on rotor position.	(3)
7		Compare AC and DC servo motor.	(3)
8		Explain the principle of operation of AC servomotor.	(3)
9		Define end effect in linear induction motor.	(3)
10		What are the modifications of DC series motor for AC operation?	(3)

PART B

Answer any one full question from each module, each carries 14 marks.

Module I

11	a)	With neat circuit diagram explain the principle of operation of PMBLDC motor for 120^0 commutation.	(9)
	b)	With diagram explain the construction of permanent magnet DC motor.	(5)

OR

12	a)	With block diagram explain the sensor less control of PMSM.	(9)
	b)	Draw and explain demagnetisation characteristics.	(5)

Module II

13	a)	With diagram explain the working of single stack variable reluctance stepper motor for full mode of operation.	(10)
	b)	If a stepper motor has 6 stator poles and having 30 stator teeth. If rotor has 20 teeth, calculate the stepping angle and resolution.	(4)

OR

14	a)	With block diagram explain closed loop control of stepper motor.	(9)
	b)	Explain the construction of permanent magnet stepper motor.	(5)

Module III

15	a)	Derive the torque equation of synchronous reluctance motor.	(7)
	b)	With diagram explain the working of C dump circuits.	(7)

OR

16	a)	With necessary diagram explain the principle of operation of 8/6 Switched reluctance motor.	(7)
	b)	With block diagram explain the control mechanism of SRM	(7)

Module IV

17	a)	With diagram explain the working of drag cup AC servo motor	(7)
	b)	With diagram explain the construction of damped servo motor.	(7)

OR

18	a)	Derive the transfer function of field-controlled DC servo motor.	(7)
	b)	With diagram explain the working of permanent magnet armature-controlled DC servo motor.	(7)

Module V

19	a)	Derive the torque equation of the linear induction motor.	(8)
	b)	Explain the working principle of Hysteresis motor.	(6)

OR

20	a)	With relevant diagram explain the construction and working of repulsion motor.	(8)
	b)	With diagram explain the construction of linear reluctance motor.	(6)

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