Reg. No.												

Question Paper Code	12237

B.E. / B.Tech. - DEGREE EXAMINATIONS, NOV / DEC 2023

Seventh Semester

Electrical and Electronics Engineering

20EEEL713 - SPECIAL ELECTRICAL MACHINES

(Regulations 2020)

Duration: 3 Hours Max. Marks: 100

PART - A (10 × 2 = 20 Marks)

Answer ALL Questions

		Marks, K-Level, CO
1.	List the applications of stepper motor.	*2,K1,CO1*
2.	Classify the different types of stepping motor.	*2,K2,CO1*
3.	What is switched reluctance motor?	*2,K1,CO2*
4.	What is the significance of closed loop control in switched reluctance motor?	*2,K1,CO2*
5.	Compare conventional DC motor and PMBL DC motor.	*2,K2,CO3*
6.	Why PMBL DC motor is called electronically commutated motor.	*2,K1,CO3*
7.	Compare synchronous motor from BLPM DC motor.	*2,K2,CO4*
8.	List the important features of permanent magnet synchronous motor.	*2,K1,CO4*
9.	Write potential applications of synchronous reluctance machine.	*2,K1,CO5*
10.	Outline the voltage and torque characteristics of Synchronous reluctance Motor.	*2,K2,CO5*

PART - B (5 × 13 = 65 Marks)

Answer ALL Questions

11.	a)	Explain the construction and working of variable reluctance stepper motor.	*13,K2,CO1*
		OR	
	b)	Outline the operation of single-stack and multi-stack stepper motors with a neat diagram.	*13,K2,CO1*
12.	a)	(i) List the main advantages and disadvantages of switched reluctance motor.	*7,K1,CO2*
		(ii) Summarize the various applications of switched reluctance motor.	*6,K2,CO2*
		OR	
	b)	Summarize the various stages in sensor less control of SRM.	*13,K2,CO2*

13. a) Illustrate the torque equation and torque ratio of a permanent magnet brushless DC motor. *13,K2,CO3*

OR

b) Infer a suitable sensor for position sensing in PMBL DC motors and explain the operation with neat sketch. *13,K2,CO3*

14. a) Explain in detail with necessary diagrams, the various power controllers used for PMSM. *13,K2,CO4*

OR

b) Outline the current control scheme of permanent magnet synchronous motor in detail. *13,K2,CO4*

15. a) Explain with neat diagram, the construction, working principle and types of synchronous reluctance motor. *13,K2,CO5*

OR

b) Infer a suitable type of synchronous reluctance motor for rewinding mill and describe in detail. *13,K,CO5*

PART - C (1 × 15 = 15 Marks)

16. a) Explain in detail the vector control of permanent magnet synchronous motor. *15,K2,CO4*

OR

b) Explain in detail repulsion motor and hysteresis motor. *15,K2,CO5*