Code No: **19EET502**

R19

III B. TECH I SEMESTER REGULAR EXAMINATIONS, FEB-2022
SPECIAL ELECTRICAL MACHINES
(Electrical and Electronics Engineering)

Time: 3 Hours **Max. Marks: 60**

Note: Answer **ONE** question from each unit **(5 × 12 = 60 Marks)**

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UNIT-I

1.	a)	Draw and explain the constructional details of a permanent magnet DC machine.	[6M]
	b)	Compare the performance characteristics of DC motors with PM DC motors.	[6M]

(OR)

2.	a)	Discuss the development of electronically commutated dc motor from conventional dc motor.	[6M]
	b)	How does temperature affect Permanent-magnet materials with emphasis on Ferrite magnets and neodymium magnets?	[6M]

UNIT-II

3.	a)	What is a hybrid stepper motor? Explain its operation and applications.	[8M]
	b)	Compare between open loop control and closed loop control of stepper motors.	[4M]

(OR)

4.	a)	Deduce the torque equation in stepper motors.	[6M]
	b)	Discuss the open loop control of a stepper motor.	[6M]

UNIT-III

5.	a)	Discuss the merits of Switched Reluctance motors compared to Induction motors.	[6M]
	b)	Explain the torque production mechanism in Switched Reluctance motors.	[6M]

(OR)

6.	a)	Discuss the advantages and disadvantages of Switched Reluctance Motors. Also list some of their applications.	[6M]
	b)	Explain why the stator pole arc angle is less than the rotor pole arc angle? Also define step angle of an SRM and Calculate step angle of a 4-phase 8/6 SRM.	[6M]
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UNIT-IV

7. a) What is the cause for torque ripples in BLDC motors? How to reduce torque ripples in BLDC motors? [6M]

   b) Prove that the PM BLDC machines have 15% more power density than the PMSM. [6M]

(OR)

8. a) With Commutation tables for every 60^0 rotor positions, discuss Commutation in Square wave brushless motors with 120^0 and 180^0 magnetic areas. [6M]

   b) Compare between square wave and sine wave permanent magnet motors. [6M]

UNIT-V

9. a) Discuss the construction and principle of operation of linear induction motor. [6M]

   b) Discuss the application of Linear Induction Motors for electric traction. [6M]

(OR)

10. a) Draw the schematic of Linear Induction Motors for electric traction application. [6M]

    b) What are the advantages and disadvantages of using linear induction motor for electric traction? [6M]

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