Code No: **R194202F** **R19** **Set No. 1**

IV B.Tech II Semester Regular Examinations, April– 2023

SPECIAL ELECTRICAL MACHINES

(Electrical and Electronics Engineering)

Time: 3 hours **Max. Marks: 75**

Answer any FIVE Questions
ONE Question from Each unit
All Questions Carry Equal Marks

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UNIT I

1 a) Explain the effect of temperature on permanent magnetic material? [7]

b) Briefly explain the application of permanent magnets in motors in terms of power density, operating temperature range and severity of operational duty? [8]

(OR)

2 a) Draw the B-H curve of a magnetic material and discuss the role of hysteresis loop. [7]

b) Explain the advantages and disadvantages of permanent magnet DC motors compared to conventional DC motors [8]

UNIT II

3 a) Explain the closed loop control of 2-phase hybrid stepping motor? [7]

b) Explain the operation of a variable reluctance stepping motor? [8]

(OR)

4 a) Explain briefly about different configurations for switching the phase windings of stepper motor? [7]

b) Explain the construction and principle of operation of Variable Reluctance Stepper Motor? [8]

UNIT III

5 a) Explain about different types of power converters used for Switched Reluctance Motors? [7]

b) What is the need for rotor position sensor in the control of Switched Reluctance motors? Explain the working of hall sensors. [8]

(OR)

6 a) Explain the construction and working principle of SRM? [7]

b) Explain the control of Switched Reluctance motor using asymmetric power converter. [8]

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UNIT IV

7 a) Briefly explain about square wave PMBLDC motors with 180^0 and 120^0 magnetic areas of commutation? [7]

b) List the advantages of PMBLDC motors? [8]

(OR)

8 a) List the differences between surface mounted and interior type PMBLDC motors? [7]

b) Derive the torque equation of square wave PMBLDC motor? [8]

UNIT V

9 a) Discuss the role and potential for linear motors in traction systems? [7]

b) Explain clearly single sided linear induction motor for the application of traction drive? [8]

(OR)

10 a) Explain in detail the working principle of Linear induction Motors. [7]

b) Explain the analysis of Linear Induction motor in terms of electromagnetic equations [8]

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