

Reg. No:

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR
(AUTONOMOUS)

M.Tech I Year I Semester Regular Examinations Jan-2020

MODELING AND ANALYSIS OF ELECTRICAL MACHINES

(Power Electronics)

Time: 3 hours

Max. Marks: 60

(Answer all Five Units 5 x 12 = 60 Marks)

UNIT-I

- 1 a Derive the state equations for Doubly Excited Rotating Actuator **6M**
b Derive the expressions for electromagnetic force in the case of a singly excited system. **6M**

OR

- 2 a Calculate the induced EMF in the excitation coil for a linear actuator and sketch $L(x)$. **6M**
b Explain the function of magnetic coupling field in an electromechanical energy Conversion device. **6M**

UNIT-II

- 3 a Calculate the reluctance force acting on the plunger of a linear actuator. **6M**
b For a 2-pole, 3-phase Y-connected symmetrical synchronous machine, derive torque equations in machine variables. **6M**

OR

- 4 a Derive an expression for the air-gap MMF in a 2-pole, 3-phase, Y-connected salient pole synchronous machine. **6M**
b Derive the torque equations in machine variables for a synchronous machine. **6M**

UNIT-III

- 5 a Explain the d-q model of induction machine in Stator reference Frame? **6M**
b Explain the transformation from three phases to two phases and vice versa in detail? **6M**

OR

- 6 a Explain the physical concept of Park's transformation? **6M**
b Explain the signal flow graph of the induction machine per unit model? **6M**

UNIT-IV

- 7 a Write the Comparison between single phase and poly -phase induction motor? **6M**
b Explain the Cross field theory of single-phase induction machine. **6M**

OR

- 8 Explain the steady state analysis of single-phase induction machine using Cross field theory **12M**

UNIT-V

- 9 a Explain the Operating principle of Switched Reluctance Motor. **6M**
b Explain the Construction and functional Aspects of Switched Reluctance Motor. **6M**

OR

- 10 Explain the commutation windings and SRM modeling with suitable circuit diagrams. **12M**

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