Registration No:

Total Number of Pages : 02   **M.TECH**
AR-17
M.TECH 1ST SEMESTER EXAMINATIONS(BACK), NOV/DEC 2019
PE, MPEPC1030
POWER CONVERSION DEVICES AND DRIVES
Time: 3 Hours   Max Marks : 70
The figures in the right hand margin indicate marks.
PART-A   (10 X 2=20 MARKS)
1. Answer the following questions.
a.   What are the voltage equations in the rotor's dq0 reference frame for Synchronous motor

b.   Draw the steady state characteristics of Induction machines

c.   Draw the basic Two-pole Machine representation of Commutator machines

d.   Draw the approximate transient torque characteristics of Synchronous machine

e.   Write the voltage and current equations of Kron's Primitive machine

f.   What are the advantages of single phase bridge converter over single phase mid-point converter?

g.   Give an expression for average voltage of single phase semi converters.

h.   What is meant by natural commutation?

i.   What types of inverters require feedback diodes?

j.   What are the control strategies for chopper?

PART-B   (5 X 10=50 MARKS)
Answer any five questions from the following.
Q2. a. Explain the Leakage fluxes in a machine with more than two windings.

   b. Explain how a differential equation for an A.C. circuit or machine can be converted to

   a phasor equation

Q3. a. Explain induction motor dynamics during starting and braking.

   b. Explain the two-axis representation of a synchronous machine

Q4. a. Briefly explain the vector control of induction motors

   b. Draw the equivalent circuit for a single phase induction motor based on the two

      revolving field theory and identify the various parameters involved in it.

Q5. a. What is an inverter? What help of circuit and waveforms explain the operation of single

       Phase bridge inverter.

   b. Draw the waveforms and discuss the performance of Sinusoidal PWM control used in

inverters.

Q6. a. Explain the operation of three phase fully controlled rectifier with R Load for a firing angle of 90º .Sketch the waveforms of

  i.   Output voltage

  ii.   Load current

  iii.   Voltage across thyristors

  b.   Define Chopper. What are the different types of Choppers? Explain its four quadrant operation

Q7. a. With neat diagram describe the static Scherbious method for slip recovery power for three-phase induction motor. What are its advantages over Kramer's drive

  b. Derive the Torque speed characteristics of 3-phase induction motor drive

Q8. a. Draw and explain the labelled block diagram of PWM control method of induction motor. Write any two advantages of it.

  b. What are the Components of power electronic Drives. Explain the Criteria for selection of Drive components

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