GIET MAIN CAMPUS AUTONOMOUS,
GUNUPUR - 765022

Registration No: | | | | | | | | | | | **M.TECH**

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M.TECH 1ST SEMESTER SUPPLE EXAMINATIONS, DECEMBER 2018

POWER CONVERSION DEVICES AND DRIVES

Branch: PE, Subject Code:MPEPC1030

(Regulations 2017)

Time: 3 Hours **Max Marks : 70** **Question Code: SD18002048**

PART-A (10 X 2=20 Marks)

1. Answer the following questions.
   a) A single phase full converter, connected to 230V,50 Hz source, is feeding a load R=10Ω in series with a large inductance that makes the load current ripple free. For a firing angle of 45°, calculate the input and output performance of this converter.
   b) Why stator voltage control is more suitable for speed control of induction motor in fan type load than constant type load?
   c) What are the voltage equations in the rotor's dq0 reference frame for Synchronous motor
   d) Draw the basic Two-pole Machine representation of Commutator machines
   e) Draw the approximate transient torque characteristics of Synchronous machine
   f) Write the voltage and current equations of Kron's Primitive machine
   g) What is meant by two reaction theory?
   h) What is meant by slip power recovery scheme
   i) What is principle of Polyphase Induction machine?
   j) Define CSI and VSI.

PART-B (5 X 10=50 Marks)

Answer any five questions from the following.

2. a) 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. [5]
   b) Derive the expressions for various self and mutual inductances of a three phase synchronous machine [5]
3. a) Explain the steady state analysis with equivalent circuit of 3-phase induction motor [5]
   b) Explain the two-axis representation of a synchronous machine [5]
4 a) Explain how a differential equation for an A.C. circuit or machine can be converted to a phasor equation [5]
   b) Explain with neat sketch the magnetically coupled circuits [5]
5. a)Describe the basic principle of working of single phase to single phase step down Cyclo converter for both continuous and discontinuous conductions for a bridge type Converter with circuit and waveforms. [5]
   b) Evaluate the input power factor and harmonic factors for a Three-Phase half controlled converters [5]
6. a)What is an inverter? What help of circuit and waveforms explain the operation of single Phase bridge inverter. [5]
   b) Draw the waveforms and discuss the performance of Sinusoidal PWM control used in inverters. [5]
7. a) Explain the 3-phase synchronous machine with and without damper bars [5]
   b) With neat diagram describe the static Kramer's method for slip recovery power for three-Phase induction motor. What are the drawbacks seen [5]
8.Write short notes on
   a) Two-axis model of 3phase induction motor. [5]
   b) Four Quadrant Chopper [5]

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