

Seat No.: _____

Enrolment No. _____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER-VI(NEW) – EXAMINATION – SUMMER 2019

Subject Code:2160902

Date:16/05/2019

Subject Name:Power Electronics – II

Time:10:30 AM TO 01:00 PM

Total Marks: 70

Instructions:

1. Attempt all questions.
2. Make suitable assumptions wherever necessary.
3. Figures to the right indicate full marks.

	MARKS
Q.1 (a) Draw circuit and waveforms for half bridge inverter.	03
(b) Write a note on sinusoidal pulse width modulation.	04
(c) Explain principle of operation of current source inverter.	07
Q.2 (a) Explain the role of feedback diodes in inverter circuit.	03
(b) Give 8 points of comparison between square wave inverter and bipolar PWM inverter.	04
(c) Explain working of 3 phase bridge inverter with star connected resistive load with 180° mode using gate signals , output phase voltage and line voltage.	07
OR	
(c) Explain working of 3 phase bridge inverter with star connected resistive load with 120° mode using gate signals , output phase voltage and line voltage.	07
Q.3 (a) Enlist limitations of basic series inverter. Draw modified series inverter which overcomes listed limitations.	03
(b) Give four points of difference between on-off control and phase angle control.	04
(c) Explain working 1- ϕ transformer tap changer with ac voltage controller circuit.	07
OR	
Q.3 (a) Explain how to vary output voltage of PWM inveter	03
(b) Draw the circuit and explain working of bridge type 1- ϕ cycloconverter with resistive load showing waveforms for output frequency $\frac{1}{3}$ rd of input frequency.	04
(c) Write a note on matrix converter.	07
Q.4 (a) Draw schematic diagram of induction motor speed control system using current source inverter.	03
(b) Explain operating modes of induction motor.	04
(c) What is slip power? Explain Kramer static system for the control of a three phase induction motor.	07
OR	
Q.4 (a) Explain effects of harmonics in induction motor drives.	03
(b) Give four points of difference between V/f control and Slip power recovery method of speed control of induction motor.	04
(c) Write a note on voltage source inverter fed synchronous motor drive.	07
Q.5 (a) State various applications which use ac electrical drives.	03
(b) Write a note on ac voltage controllers with PWM control.	04
(c) Write a note on three phase to single phase cycloconverter with inter group reactor.	07

OR

- Q.5** (a) State various speed control techniques for a synchronous motor. **03**
(b) Explain the principle of on-off control for ac voltage controllers. **04**
(c) Explain working of mid - point cycloconverter with circuit diagram and wavefrom. **07**
