

**GUJARAT TECHNOLOGICAL UNIVERSITY**  
**BE- SEMESTER-IV (NEW) EXAMINATION – WINTER 2020**

Subject Code:3140915

Date:26/02/2021

Subject Name:Power Electronics

Time:02:30 PM TO 04:30 PM

Total Marks:56

Instructions:

1. Attempt any FOUR questions out of EIGHT questions.
2. Make suitable assumptions wherever necessary.
3. Figures to the right indicate full marks.

	Marks
<b>Q.1</b> (a) Draw waveform of full bridge topology of 1-Phase bridge inverter with resistive load.	<b>03</b>
(b) Discuss SVPWM technique in brief.	<b>04</b>
(c) Sketch unipolar and bipolar PWM	<b>07</b>
<b>Q.2</b> (a) Derive output voltage equation for single phase full wave rectifier	<b>03</b>
(b) State the merits & demerits of current source inverter & voltage source inverter.	<b>04</b>
(c) Explain 3 phase inverter operation for $120^\circ$ with the gate voltage and phase voltage waveform	<b>07</b>
<b>Q.3</b> (a) Derive output voltage equation for single phase half wave rectifier.	<b>03</b>
(b) Give classification of different techniques for voltage control of inverter. Explain any one.	<b>04</b>
(c) Analysis of working of 3- $\phi$ half wave controlled rectifier with RL load with continuous conduction mode	<b>07</b>
<b>Q.4</b> (a) Derive AC voltage controller average output voltage equation	<b>03</b>
(b) Explain protection of SCR and its design.	<b>04</b>
(c) Explain Dual Converter.	<b>07</b>
<b>Q.5</b> (a) Explain CSI	<b>03</b>
(b) Explain Snubber circuit and its design	<b>04</b>
(c) Explain the basic principle of operation of a cycloconverter with neat equivalent circuit diagram.	<b>07</b>
<b>Q.6</b> (a) Explain any one chopper.	<b>03</b>
(b) Derive inverter output voltage	<b>04</b>
(c) Explain Buck Boost converter	<b>07</b>
<b>Q.7</b> (a) Explain Matrix converter	<b>03</b>
(b) Define Mid point CycloConverter.	<b>04</b>
(c) Explain DC to DC converter.	<b>07</b>
<b>Q.8</b> (a) Give Application of Power Electronics.	<b>03</b>
(b) Explain Buck converter.	<b>04</b>
(c) Explain three stage sequence control AC voltage controller with RL load	<b>07</b>

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