

**GUJARAT TECHNOLOGICAL UNIVERSITY****BE- SEMESTER-VII (NEW) EXAMINATION – WINTER 2020****Subject Code:2172408****Date:25/01/2021****Subject Name:Advanced Power Electronics Devices & Interface Circuits****Time:10:30 AM TO 12:30 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) Why do semiconductors have a band gap?	<b>03</b>
	(b) State working principle of Frequency & Speed Measurement.	<b>04</b>
	(c) Draw and explain Analog to Digital converter circuit.	<b>07</b>
<b>Q.2</b>	(a) Write a short note on use of Power Scope for power electronics applications.	<b>03</b>
	(b) Write short note on Grounding for Power Circuits.	<b>04</b>
	(c) Write the Merits and Demerits of Wide Bang Gap Power Semiconductor Devices.	<b>07</b>
<b>Q.3</b>	(a) State different methods of protecting power switch against over load. Explain any one with neat diagram.	<b>03</b>
	(b) Enlist isolated and non-isolated driver ICs.	<b>04</b>
	(c) Explain Hall effect current sensors in detail.	<b>07</b>
<b>Q.4</b>	(a) Write full form of MOSFET. Discuss need of MOSFET driver?	<b>03</b>
	(b) State various principles used in transducers used for current measurement in industry.	<b>04</b>
	(c) Explain with neat diagram, Single Switch Driver IC (e.g. HCPL316J) with SC Protection.	<b>07</b>
<b>Q.5</b>	(a) What is meaning of $V_{OH}$ and $V_{OL}$ voltage levels of logic ICs.	<b>03</b>
	(b) Explain any DC Current measurement technique.	<b>04</b>
	(c) Explain the Interfacing of Digital Signals with Different Voltage Levels.	<b>07</b>
<b>Q.6</b>	(a) Write full form of TTL and CMOS. Explain how a TTL IC can be interfaced with CMOS IC.	<b>03</b>
	(b) Explain the Signal Conditioning.	<b>04</b>
	(c) Explain application of Linear Opto-coupler.	<b>07</b>
<b>Q.7</b>	(a) Write a full form of CRO and DSO. Compare CRO with DSO.	<b>03</b>
	(b) Draw block diagram of CRO.	<b>04</b>
	(c) Explain the F to V Converter in detail.	<b>07</b>
<b>Q.8</b>	(a) State various wide band gap materials and their energy band gap.	<b>03</b>
	(b) Draw Analog to Digital converter circuit.	<b>04</b>
	(c) Explain the Differential Voltage Probe & Current Probe.	<b>07</b>

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