Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–VII (NEW) EXAMINATION – SUMMER 2024

Subject Code: 3172413 Date:28-05-2024

Subject Name: Advanced Power Electronics Devices and Interface Circuits

Time:02:30 PM TO 05:00 PM Total Marks:70

Instructions:

1. **Attempt all questions.**
2. **Make suitable assumptions wherever necessary.**
3. **Figures to the right indicate full marks.**
4. **Simple and non-programmable scientific calculators are allowed.**

			MARKS
Q.1	**(a)**	State advantage of SI devices over WBG semiconductor devices.	**03**
	(b)	Explain important of Band Gap in semiconductor devices.	**04**
	(c)	Discuss important features of WBG devices with their applications.	**07**
Q.2	**(a)**	Discuss role of driver circuit in Power electronics.	**03**
	(b)	Explain any one half bridge driver IC with pin diagram.	**04**
	(c)	Discuss requirement & importance of Isolation in driver circuits.	**07**
		OR	
	(c)	Explain SCR driver IC (MOC3002) in detail.	**07**
Q.3	**(a)**	Enlist isolated and non-isolated driver ICs.	**03**
	(b)	Discuss methods of DC current measurements.	**04**
	(c)	Write a short note on (1) current transformer (2) Hall effect current sensor.	**07**
		OR	
Q.3	**(a)**	Draw pin diagram of ULN 2803.	**03**
	(b)	Explain the Galvanic Isolation & its importance.	**04**
	(c)	Discuss Voltage Measurement using OP-AMP.	**07**
Q.4	**(a)**	Explain in brief Linear opto coupler IL300.	**03**
	(b)	Write short note on Measuring and Interfacing Analog Signals.	**04**
	(c)	Discuss F to V Converter using L331.	**07**
		OR	
Q.4	**(a)**	Enlist applications of Logic Analyzer.	**03**
	(b)	Write a short note on current probe and voltage probe.	**04**
	(c)	Describe general steps to inductor design for power converters.	**07**
Q.5	**(a)**	Explain briefly, floating ground in power converters. .	**03**
	(b)	Explain Transformer Design for full bridge DC-DC converter.	**04**
	(c)	Explain heat sink calculations and design in detail.	**07**
		OR	
Q.5	**(a)**	Enlist various types of cores used in high frequency magnetic design.	**03**
	(b)	Discuss considering of grounding for Power Circuits.	**04**
	(c)	State the requirement and importance of cooling in semiconductors.	**07**

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