GUJARAT TECHNOLOGICAL UNIVERSITY
BE- SEMESTER–VII (NEW) EXAMINATION – WINTER 2024

Subject Code:3172413   **Date:07-12-2024**

Subject Name: Advanced Power Electronics Devices and Interface Circuits

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.**
4. **Simple and non-programmable scientific calculators are allowed.**

			MARKS
Q.1	**(a)**	What is logic analyzer? State its applications.	**03**
	(b)	Discuss requirement of isolation for driver circuit design.	**04**
	(c)	What are wide band gap materials? What are their advantages over other semiconductors?	**07**
Q.2	**(a)**	Can pulse transformer be used for driving IGBT ? Justify your answer.	**03**
	(b)	Explain MOC203x TRIAC driver IC with its internal diagram.	**04**
	(c)	Explain half bridge driver circuit using IR2110 IC.	**07**
		OR	
	(c)	Explain application of TLP250 driver IC with necessary diagrams.	**07**
Q.3	**(a)**	List various shapes of core used for transformer design.	**03**
	(b)	Explain opto-coupler driver IC MCT 2E as driver of single semiconductor switch.	**04**
	(c)	Explain step by step procedure for transformer design.	**07**
		OR	
Q.3	**(a)**	Which material is suitable for high frequency inductor design? Why?	**03**
	(b)	Explain LM331 IC for F to V conversion application.	**04**
	(c)	Discuss hall effect current sensor for current measurement.	**07**
Q.4	**(a)**	Give advantages of power scope.	**03**
	(b)	What are differential probes? Explain its application.	**04**
	(c)	Explain various thermal coefficients related to heat sink design.	**07**
		OR	
Q.4	**(a)**	How many isolated power supplies are required for single phase full bridge inverter driver circuits. Justify your answer.	**03**
	(b)	Describe current probe in brief.	**04**
	(c)	Discuss various protections available with modern driver ICs.	**07**
Q.5	**(a)**	Explain any type of ADC in brief.	**03**
	(b)	Explain forced cooling of heat sink.	**04**
	(c)	Derive equation of inductor for buck converter.	**07**
		OR	
Q.5	**(a)**	Why ADC is required in reference to driver circuit design.	**03**
	(b)	How current could be measured with the help of voltage probe?	**04**
	(c)	Derive equation of inductor for boost converter.	**07**

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