Enrollment No./Seat No.:

GUJARAT TECHNOLOGICAL UNIVERSITY

Bachelor of Engineering - SEMESTER - VI EXAMINATION - SUMMER 2025

Subject Code: 3160004 **Date: 26-05-2025**

Subject Name: Fundamental of Semiconductor Package Manufacturing and Test

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)**	List out any 3 package types from each category for common, advanced, and emerging package types	**03**
	(b)	What is Semiconductor Packaging? Why is it needed?	**04**
	(c)	What is Encapsulation Process? What is its purpose? List down different types of encapsulation technique?	**07**
Q.2	**(a)**	What is Gage Repeatability & Reproducibility?	**03**
	(b)	What is Burn In Test ? Draw the Burn Bath tub curve ?	**04**
	(c)	What are the limitations of 2D NAND ? What is the Advantage of 3D NAND ?	**07**
		OR	
	(c)	What is Parametric Testing? And why do we collect Parametric Testing data ?	**07**
Q.3	**(a)**	What does it means by TAL (time above liquid) in reflow profile?	**03**
	(b)	What is DAF? Explain in detail its major ingredients.	**04**
	(c)	Explain the manufacturing process of organic substrates.	**07**
		OR	
	(a)	Describe reliability testing.	**03**
	(b)	Explain Storage life test(SLT).	**04**
	(c)	Describe 5 EMC ingredients and briefly explain its purposes	**07**
Q.4	**(a)**	Write working and application of Time domain reflectometer (TDR).	**03**
	(b)	Draw and explain the schematic for Basic FA(Failure analysis) Flow	**04**
	(c)	How 3D X-ray technique is different compared to 2D-Xray technique?	**07**
		OR	
	(a)	List down Physical failure analysis (PFA) techniques	**03**
	(b)	What is a Curve Tracer and what are its applications?	**04**
	(c)	What is Failure analysis? What are the broad categories of semiconductor device fails?	**07**

Q.5	**(a)**	List different methods for ranking risks.	**03**
	(b)	What are some of the differences between Design FMEA (DFMEA) and Process FMEA (PFMEA)	**04**
	(c)	What are the roles of leaders and employees in implementing QMS and what are the benefits of implementing Quality Management System?	**07**

OR

	(a)	Why Statistical Process Control is important in industry?	**03**
	(b)	Describe the difference between Issues and Risks. Describe how FMEA helps mitigate Risks and prevents Issues.	**04**
	(c)	Explain how cost of quality can help an organization improve its business performance and customer satisfaction. Provide examples of prevention, appraisal, internal failure, and external failure costs in your answer.	**07**

***