Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

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

Subject Code: 3171926 Date:22-05-2024

Subject Name: Rapid Prototyping

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)**	Differentiate additive and subtractive manufacturing processes.	**03**
	(b)	Give classification of Rapid Manufacturing processes.	**04**
	(c)	Explain the complete process of Reverse Engineering with a suitable example.	**07**
Q.2	**(a)**	Write full form of CAD data formats: (i) STL, (ii) LEAF, (iii) IGES	**03**
	(b)	Differentiate between direct and adaptive slicing.	**04**
	(c)	Why part orientation and support generation is important for rapid prototyping? Explain with suitable examples and neat sketches.	**07**
		OR	
	(c)	Explain the validity checks and repair procedures used for CAD data conversion for rapid prototyping with suitable example.	**07**
Q.3	**(a)**	What is micro-stereolithography?	**03**
	(b)	Explain the photopolymerization process used for Stereolithography with a neat sketch.	**04**
	(c)	Write advantages, limitations and applications of Fused Deposition Modelling process.	**07**
		OR	
Q.3	**(a)**	Define Laminated Object Manufacturing (LOM).	**03**
	(b)	Discuss in brief about various materials used for LOM.	**04**
	(c)	Compare Selective Laser Sintering, 3D Printing and LOM processes used for Rapid prototyping.	**07**
Q.4	**(a)**	Write applications of 3D Printing process.	**03**
	(b)	Briefly explain the process physics of Ultrasonic Consolidation process.	**04**
	(c)	Write short note on: Laser Engineered Net Shaping.	**07**
		OR	
Q.4	**(a)**	Write applications of Ultrasonic Consolidation process.	**03**
	(b)	Explain the process physics of Selective Laser Sintering process with a neat sketch.	**04**
	(c)	Write short note on: Tooling for rapid prototyping processes.	**07**
Q.5	**(a)**	List the materials used for photopolymerization process.	**03**
	(b)	Explain various errors that may occur during part building phase in rapid prototyping.	**04**
	(c)	Explain various stages of rapid prototyping process with neat sketches.	**07**
		OR	
Q.5	**(a)**	List the materials used for 3D printing process.	**03**
	(b)	Explain various post-processing errors in rapid prototyping process.	**04**
	(c)	Discuss various part building errors in SLA & SLS process.	**07**

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