Seat No.: _____ Enrolment No.

GUJARAT TECHNOLOGICAL UNIVERSITY

BE- SEMESTER–V (NEW) EXAMINATION – WINTER 2020

Subject Code:3150301 **Date:27/01/2021**

Subject Name:Biomaterial and Implants

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
Q.1	**(a)**	Define the following terms: (i) Biocompatibility (ii) Bioresorbable material	**03**
	(b)	Enlist the mechanical properties of Biomaterials and discuss two of them in brief.	**04**
	(c)	Explain Metallic Corrosion process in detail with electrochemical reactions and necessary schematics.	**07**
Q.2	**(a)**	Give properties of Nitinol and their medical applications.	**03**
	(b)	Write a short note on Dental Amalgam.	**04**
	(c)	Explain Total Hip Replacement in detail with neat diagram.	**07**
Q.3	**(a)**	Define Polymerization and enlist the types of polymerization process.	**03**
	(b)	Write a short note on Glass Ceramics.	**04**
	(c)	Explain the types of Stainless Steel alloys with its composition, properties and applications.	**07**
Q.4	**(a)**	Define Bioceramics and give the classification of Bioceramics in brief.	**03**
	(b)	Write a short note on Hydrogel.	**04**
	(c)	Explain the types of Cobalt based alloys with its composition, properties and manufacturing process.	**07**
Q.5	**(a)**	Give the Biomedical applications of PMMA.	**03**
	(b)	Discuss the adverse biological effects of Implants on Human body.	**04**
	(c)	Explain Artificial Heart valve in detail with necessary diagrams.	**07**
Q.6	**(a)**	What is Composite Biomaterials? Enlist the different types of composite materials.	**03**
	(b)	Explain Vascular grafts with its application.	**04**
	(c)	Explain Contact lenses and Intra Ocular Lenses (IOL) in detail.	**07**
Q.7	**(a)**	Give the difference between Atactic and Isotactic structure of polymers.	**03**
	(b)	Write short note on Bio-inert Ceramics.	**04**
	(c)	Explain different Structural arrangements of Polymer in detail with necessary diagram.	**07**
Q.8	**(a)**	Define: Glass Transition Temperature & Melting Temperature.	**03**
	(b)	Describe Structure & properties of Particulate Composites.	**04**
	(c)	Explain methods for testing and evaluating Biocompatibility of Biomaterials.	**07**

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