Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE – SEMESTER – V (NEW) EXAMINATION – WINTER 2015

Subject Code: 2150301 **Date:03/12/ 2015**

Subject Name: Biomaterials & Implants

Time:10:30am to 1:00pm **Total Marks: 70**

Instructions:

1. **Attempt all questions.**
2. **Make suitable assumptions wherever necessary.**
3. **Figures to the right indicate full marks.**

Q.1	**(a)**	Define following terms in detail: Biomaterial, Biocompatibility, Biological material, Bioresorbable material.	**07**
	(b)	Explain various applications of Biomaterials with examples.	**07**
Q.2	**(a)**	Explain Vascular grafts & Artificial heart valve as a Cardiac implant.	**07**
	(b)	The probability of failure of a knee replacement in the first year are 5% for infection, 3% for wear, 2% for loosening, 1% for surgical complication & 4% for fracture. Calculate the reliability of implant. Suppose in addition, 10% of the patients complain of excessive pain; again calculate the reliability.	**07**
		OR	
	(b)	Write a short note on Stainless steel.	**07**
Q.3	**(a)**	Explain types of Polymerization reaction.	**07**
	(b)	Enlist the types of cobalt based alloys. Explain the lost wax method for manufacturing of implants using Co-based alloys.	**07**
		OR	
Q.3	**(a)**	Write a short note on PMMA & PHEMA.	**07**
	(b)	Explain different types of Dental metals with properties & applications.	**07**
Q.4	**(a)**	Explain Glass ceramic as a Biomaterial.	**07**
	(b)	Briefly explain applications of Composite Biomaterials.	**07**
		OR	
Q.4	**(a)**	Write a short note on Calcium phosphate as a Ceramic biomaterial.	**07**
	(b)	Explain Corrosion & Wear of biomaterials.	**07**
Q.5	**(a)**	Explain Biodegradable materials with their applications.	**07**
	(b)	Explain Contact lenses & IOLs.	**07**
		OR	
Q.5	**(a)**	Explain different Biological effects of the implants on the human body.	**07**
	(b)	Explain Total Hip and Knee replacement in detail.	**07**

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