Seat No.: _____ **Enrolment No._____**

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–V (NEW) - EXAMINATION – SUMMER 2017

Subject Code: 2150301 **Date: 12/05/2017**

Subject Name: Biomaterials & Implants

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.**

			MARKS
Q.1		**Short Questions**	**14**
	1	What is Biomaterial?	
	2	Which polymer is prefer for Drug delivery system? (a) PMMA (b) Hydrogel (c) Polyesters (d) b & c	
	3	Which polymer is prefer for dental Implants? (a) PMMA (b) Hydrogel (c) Polyesters (d) poly hydroxyethyl methacrylate (PHEMA)	
	4	What is Bovine heterograft?	
	5	Define Radiopacity.	
	6	Give name of materials that are preferable for surgical wires and pins.	
	7	What is biological fixation?	
	8	What is shape memory effect?	
	9	Define Biocompatibility.	
	10	What is relatively bioinert ceramics? Give names of relatively bioinert ceramics.	
	11	Enlist the used of Gold as Biomaterial.	
	12	Give the name of materials used for ligaments repairs.	
	13	Which materials used for collecting impression in dental applications?	
	14	Give the name of materials used for Tissue adhesive.	
Q.2	**(a)**	Enlist materials used in THR (total Hip replacement) implant.	**03**
	(b)	Give properties of Nitinol and their medical applications.	**04**
	(c)	Give introductory note on Biological effects of the implants on the human body.	**07**
		OR	
	(c)	Explain composition and mechanical properties of Cobalt based alloy for medical applications.	**07**
Q.3	**(a)**	What is the bionic eye?	**03**
	(b)	Write introductory note on dental applications of ceramics	**04**
	(c)	Explain important surface properties for desirable biocompatibility of implants.	**07**
		OR	
Q.3	**(a)**	Write a short note on Biological Grafts.	**03**
	(b)	Explain metallic corrosion process with necessary schematic.	**04**

	(c)	What is surface reactive ceramics? Explain temperature-time cycle for a glass ceramic.	**07**
Q.4	**(a)**	Define/explain meaning of following terms. • Xenografts • carcinogenesis	**03**
	(b)	Write a short note on nano-biomaterials and their applications.	**04**
	(c)	Explain role of ceramics for Drug delivery applications.	**07**
		OR	
Q.4	**(a)**	Define/explain meaning of following terms. • Genotoxicity • Hypersensitivity	**03**
	(b)	Explain methods for testing and evaluating biocompatibility.	**04**
	(c)	Write a short note on biodegradable materials and their applications.	**07**
Q.5	**(a)**	Write a short note on sutures materials.	**03**
	(b)	Explain role of re-sorbable material in bone regeneration.	**04**
	(c)	Explain the process of polymerization. Enlist and describe the characteristics of bio-erodible polymers.	**07**
		OR	
Q.5	**(a)**	Give details about materials used for maxillofacial implants.	**03**
	(b)	Give structural & material composition details of Intra ocular lenses (IOLs).	**04**
	(c)	Explain engineering aspects of artificial heart valves.	**07**

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