

**GUJARAT TECHNOLOGICAL UNIVERSITY****BE - SEMESTER- V EXAMINATION – SUMMER 2020****Subject Code: 2150301****Date: 26/10/2020****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
<b>Q.1</b>	(a) Explain in detail the applications of polymers as a biomaterial.	<b>03</b>
	(b) Define following terms: Biocompatibility, Xenografts, Biological material, allografts.	<b>04</b>
	(c) Discuss the Biological effects of the implants on the human body.	<b>07</b>
<b>Q.2</b>	(a) What are Rheological Properties of Biological Solids?	<b>03</b>
	(b) Explain the standard and assessment for biomaterial.	<b>04</b>
	(c) Briefly explain applications of Composite Biomaterials.	<b>07</b>
	<b>OR</b>	
	(c) Write a short note on PMMA & PHEMA.	<b>07</b>
<b>Q.3</b>	(a) State mechanical properties of stainless steel	<b>03</b>
	(b) Explain composition and mechanical properties of Cobalt based alloy for medical applications.	<b>04</b>
	(c) Explain various techniques of biomaterial testing.	<b>07</b>
	<b>OR</b>	
<b>Q.3</b>	(a) Define	<b>03</b>
	1) Hemocompatibility	
	2) Osteocompatibility	
	(b) List out properties of Nitinol and their medical applications.	<b>04</b>
	(c) Describe the Condensation Polymerization Process in Detail	<b>07</b>
<b>Q.4</b>	(a) Explain the Inferior vena cava filter in detail.	<b>03</b>
	(b) Write a short note on nano-biomaterials and their applications.	<b>04</b>
	(c) Enlist and explain Titanium based alloys and their applications	<b>07</b>
	<b>OR</b>	
<b>Q.4</b>	(a) Enlist the factors responsible for orthopedic implant failure.	<b>03</b>
	(b) What is Polymerization? List out the factors that influence mechanical Properties of Polymers.	<b>04</b>
	(c) Explain manufacturing process of Stainless-steel based Implants.	<b>07</b>
<b>Q.5</b>	(a) Explain difference between bioinert and bioactive biomaterials.	<b>03</b>
	(b) Write a short note on IOLs & Contact lenses.	<b>04</b>
	(c) Enlist the biomaterials used in dental implants and explain any two of them in detail	<b>07</b>
	<b>OR</b>	
<b>Q.5</b>	(a) Define 1) Bioresorbable material 2) Shape memory effect	<b>03</b>
	(b) Explain hydrogel in detail.	<b>04</b>
	(c) Differentiate between Partial & Total Knee Replacement and Explain Total Knee Replacement in detail.	<b>07</b>

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