

Subject : Bio Materials

Examination : M-Mat-Engg, Material Engineering, 2nd Semester, 2025

Metallurgical & Material Engineering Department

Ref No. : EX/PG/Mat/PE/T/123A/2025

Answer any 'Two' from the Question no (2,3,4) and all other Questions		Marks
1	a) State the importance of bio materials.	5
	b) Write short note on Nitinol alloy for using as biomaterial	5
2	a) What is corrosion?	2
	b) Write short notes on intergranular corrosion & microbial corrosion	7
	c) What is cathodic protection. State the importance of this process	3+3
	d) Describe the uses of Tantalum and Platinum group Metals as biomaterial	5
3	a) State the advantage of using 316L over 304 type of stainless steel	4
	b) Which type of stainless steel is used for surgical equipment & why?	4
	c) Briefly describe the production process of austenitic stainless steel	7
	d) Describe about Co-Cr alloys to be used as biomaterials	5
4	a) Write short note on Wolff's Law and Stress Shielding	5
	b) Write about the mechanical suitability of using different types of Titanium alloys as biomaterials along with the role of Titanium Hydroxyapatite composite	10
	c) Differentiate between metallic, ceramic & polymeric biomaterials in view of their uses with reasons	5
5	a) Define Biomaterials and discuss about Biocompatibility	2+4
	b) Discuss the use of Biopolymers as Biomaterials in different fields.	4
6	a) Describe the use and applications of different biomaterials in Neurology	10
	-Or-	
	b) Describe the use and applications of different biomaterials in Cardiology.	10
7	a) Describe the use and applications of different biomaterials in Ophthalmology	10
	-Or-	
	b) Describe the use and applications of different biomaterials in Dentistry.	10
8	a) What are ceramics? Describe different ceramics used as a biomaterials.	2+3
	b) Write about the future trends and challenges in the application of biomaterials in healthcare services.	5
9	a) What do you understand by total knee replacement? Describe about various materials used in total knee replacement. Give a neat diagram of knee prosthesis	2+3+5
	-Or-	
	b) Describe the sequence of events took place when a foreign material is inserted into the human body.	10