

M.E. Matallurgical and Material Engineering 1st Year 2nd Semester Exam-2024**BIO MATERIALS****Time : Three hours****Full Marks : 100****PART - I**

| | | Answer Question No 1 & any 'Two' from the rest | Marks |
|---|----|---|-------|
| 1 | a) | Define Bio Materials | 2 |
| | b) | State the advantages and disadvantages of different types of biomaterials | 4 |
| | c) | Write short note on additive manufacturing technique to produce biomaterials | 4 |
| 2 | a) | State the importance of Corrosion studies for biomaterial application | 4 |
| | b) | Name & explain different types of Corrosion on metals | 3+7 |
| | c) | Discuss about different types of Co-Cr Alloys along with their advantages & disadvantages of using them as biomaterial | 6 |
| 3 | a) | Describe the uses of Tantalum and Platinum group Metals as biomaterial | 5 |
| | b) | Discuss why austenitic stainless steel is used in biomedical application. | 5 |
| | c) | State the advantage of using 316L over 304 type of stainless steel | 5 |
| | d) | Which type of stainless steel is used for surgical equipment & why? | 5 |
| 4 | a) | Write short note on Dental Implant System | 6 |
| | b) | What are the different types of Titanium alloys used in biomedical applications & describe the importance of Low Modulus Titanium Alloys and Hydroxyapatite | 4+3+3 |
| | c) | Write short note on Nitinol alloy used as biomaterial | 4 |

PART - II

| | | Answer any 'Two' from the group | Marks |
|---|----------------------|--|-------|
| 5 | a) | Draw a label diagram mentioning the biomaterials used in different areas of human body | 8 |
| | b) | What is Total Hip Knee Prosthesis. Discuss in details with diagram along with the biomaterials used | 12 |
| | c) | Write short note on Biocompatibility | 5 |
| 6 | Write short notes on | | 5X5 |
| | a) | Is Alumina truly bio-inert | |
| | b) | Stents: Materials, use and classification | |
| | c) | DRDO | |
| | d) | Ethical issues regarding biomaterials | |
| 7 | e) | Bio Polymers | |
| | a) | Describe the sequence of events that take place when a foreign material is inserted inside the human body. | 9 |
| | b) | Write in detail about the biomaterials used by Ophthalmologists along with a label diagram of biomaterials inserted in eye | 12 |
| | c) | Discuss about the utility of the Suture materials | 4 |