



- N.B.: (1) Question No. 1 is compulsory.  
(2) Attempt any **four** questions from remaining **six** questions.  
(3) **Figures** to the **right** indicate **full** marks.

1. (a) Explain in brief types of leathers used in Prosthesis and Orthotics devices. 4  
(b) List advantages and disadvantages of kidney transplant as compared to dialysis machine. 4  
(c) Give the requirements of biomaterials with applications in Cardiovascular system. 4  
(d) Give the composition and application of stainless steel as a biomaterial. 4  
(e) Why metals are generally less biocompatible than polymers and ceramics ? 4
2. Describe different types of devices having applications in ophthalmology, which biomaterials are used in their construction. 20
3. (a) Describe possible biomedical uses of alumina. Give advantages and disadvantages of ceramic implants. 10  
(b) Write short notes on the following :— 10  
(i) Bone Cement (ii) Hydrogels.
4. (a) Explain the common methods used for characterising the biomaterial surfaces. 10  
(b) Explain types, composition and properties of cobalt based alloys. 10
5. (a) Explain the composition and application of Ti and Ti based alloys. 10  
(b) Explain different types of heart valves with its constructional features and the materials used for construction. 10
6. (a) Describe different types of corrosion which occur in metallic implants. 8  
(b) Give the properties of carbon and explain the method of manufacture of carbon implants. 8  
(c) Describe different methods of preparation of biomedical polymers. 4
7. (a) What is blood compatibility ? What are the factors affecting the blood compatibility ? 6  
(b) Explain the different types of dialyzers. List materials for a blood access device giving reasons for your selection. 14