

21/6/22 (E)  
6 Hrs.

Exam.Code:0910  
Sub. Code: 6718

2062  
B.E. (Biotechnology) Sixth Semester  
BIO-615: Biomaterials

Time allowed: 3 Hours

Max. Marks: 50

**NOTE:** Attempt five questions in all, including Question No. 1 which is compulsory and selecting two questions from each Section.

x-x-x

I. Answer the following in 3-4 sentences only:-

- i. What is a synthetic copolymer? Give an example.
- ii. What are soft contact lenses?
- iii. What are major applications of collagen in tissue engineering?
- iv. What is a heteropolymer? Give a suitable example.
- v. What is the use of hydroxyapatite?
- vi. What is condyle?
- vii. What is the nature of bio-glass?
- viii. How blood clotting is avoided in the implanted cardio-vascular stent?
- ix. What are the function(s) of Blood Clotting Factor VIII & IX?
- x. What symptoms indicate a need for knee joint replacement?

(10x1)

Section-A

- IIa. What are biomaterials? Describe their physio-chemical characteristics and important applications in medical sciences.
- b. What are synthetic hydrogels? Describe their process of synthesis, characteristics and application in medical science. 5, 5
- IIIa. What are bio-inert ceramics? Describe their composition, structural features and applications in detail.
- b. What are biopolymers? Describe their types, characteristics and important applications. 5, 5
- IVa. What are metallic alloy-based implants? Enlist any three examples, their composition and important applications in tissue repair.
- b. How biomaterials can be designed to control cell attachment, cell proliferation and cell-signaling in an injured host tissue? 6, 4

Section-B

- Va. What are graft *versus* host immune responses? How they can be managed in case of an organ graft in a host?
- b. What are various steps involved in the process of wound healing in a host?
- c. What is a pacemaker? 4, 4, 2
- VIa. What are orthopedic implants? Describe their major types, characteristics and medical applications.
- b. What is a pace maker? Why it is implanted in the patient? 6, 4
- VIIa. What are filling and dental restorative materials? How they are useful in dental restoration?
- b. Describe anatomy of the heart? Why there is a need for valve replacement in some of the cardiac patients? 4, 6

x-x-x