Exam. Code: 0910
Sub. Code: 6319

2023

B.E. (Biotechnology) Sixth Semester

BIO-615: Biomaterials

Time allowed: 3 Hours

Max. Marks: 50

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

x-x-x

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

a) What is a metallic bio-inert alloy? Give a suitable example.

b) What is the important property of bio-inert ceramics?

c) What is keratoprosthesis?

d) What is the difference between a muscle and a cartilage?

e) What is a synthetic homopolymer? Give a suitable example.

f) What is a tricuspid valve?

g) What is artificial tears-solution and a need for it?

h) What is the importance of an elastic modulus of a biomaterial?

i) How blood clotting can be promoted at the place of an injury?

j) What is a foreign body immune response? (10x1)

UNIT - I

II. a) What are bio-ceramics? Describe their chemical nature, properties and applications in tissue engineering.

b) What are metallic alloys? Describe advantages and disadvantages, if any, of titanium based alloys in tissue repair in the patients. (5,5)

III. a) What are biodegradable polymers? Describe their structural properties and medical applications.

b) What are resorbable bio-ceramics? Describe their important characteristics and applications in bone injury. (5,5)

P.T.O.

IV. a) What is a xerogel? How its swelling capacity is determined? Describe the synthesis of any smart polymer in tissue engineering.

b) What are proteoglycans? How they are useful in tissue repair?

c) What is elastin?

(5,4,1)

UNIT - II

V. a) What is artificial blood? Compare and contrast the biochemical properties of natural blood and artificial blood.

b) What is host graft rejection? What causes immune rejection of an implanted tissue in the host?

c) What is the function of fibrinogen in the blood? (5,4,1)

VI. a) What are orthopedic implants? Describe their major types, characteristics and medical applications.

b) What is a suture? Describe its types, composition and applications in brief.

c) Which fluid is present in the knee joint? (5,4,1)

VII. a) Describe tooth anatomy by labeling parts of a tooth? How restorative materials are responsible for maintaining a healthy denture?

b) Describe the anatomy of a human eye? How intraocular lens(es) are used for restoration of myopic eye vision? (5,5)

x-x-x