Exam.Code:0910
Sub. Code: 33379

2055

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 Section.

x-x-x

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

i. What is hydroxy apatite and its use(s)?
ii. Which is a crosslinker?
iii. Name any two synthetic polymers.
iv. What is a heteropolymer? Give a suitable example.
v. What is a bicuspid valve and its function?
vi. What is the use of silicone in tissue repair?
vii. What is cardiac valve stenosis?
viii. How blood thinning can be achieved in a cardiovascular disease patient?
ix. What is RGD peptide and its function?
x. How fatigue strength of a biomaterial is determined? 1 X 10 =10

Section-A

IIa. Describe the prominent surface properties of the biomaterials and the influence of environmental factors on them.

b. What are metallic alloys? Describe advantages and disadvantages of use of titanium-based alloys in detail. 5, 5

IIIa. What are smart scaffolds? Describe their important features and advantages in tissue regeneration?

b. What are *poly*urethanes? Describe their major as mechanical, adhesion and biological properties in detail. 5, 5

IVa. What is bio-resorbable ceramics? Give suitable examples, their types and medical applications in brief?

b. What are biopolymers? Describe the use and advantages of collagen and cellulose in tissue engineering. 5, 5

Section-B

Va. Describe the mechanism of blood clotting with the help of schematic diagrams. How cardiac stunt can be modified to prevent blood-clot formation?

b. What is graft host-immune rejection? How it can be prevented by designer-biomaterials? 5, 5

VIa. What are orthopedic implants? Describe their major types and describe the role of temporary fixation devices in reconstructing a severely fractured pelvic bone.

b. What is an artificial cornea? Describe its composition and medical applications in detail. 5, 5

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

b. What are skin sutures? Describe their types, nature and advantages in the patients, if any. 5, 5

x-x-x