B10-04 201

Exam.Code:0910
Sub. Code: 33379

2056
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:

a) Name any two naturally occurring biopolymers.

b) Differentiate between allograft and xenograft.

c) Catgut sutures material is made up of intestinal tissue of which animal?

d) Why is corneal transplantation success rate very high?

e) What is a pacemaker? Enlist different types of pacemakers available commercially.

f) Define hydrogel and mention its one application.

g) Differentiate between thrombocytosis and thrombocytopenia.

h) Classify the polymers based on the arrangement of functional groups in the chains.

i) Define Hooks law.

j) What is fatigue failure of biomaterial? (10x1)

UNIT - I

II. a) Elaborate on the role of Physico-chemical properties of biomaterials in the selecting appropriate biomaterial of a particular use. Give few examples.

b) Write a descriptive note on suture materials by highlighting advantages and disadvantages of each material. (2x5)

III. a) How can you evaluate the mechanical properties of biomaterial from stress strain curve? Explain each region using a diagram.

b) A metal guide wire is 3.5mm diameter and 1.5 m long, when a force of 15 N is applied during surgery it streaches by 0.4 mm. Assuming the wire to be elastic determine stress, strain and modulus of elasticity in GPa. (2x5)

P.T.O.

IV. a) A patient met with an accident and lost his half jaw completely. You are heading a team of biomedical engineers and doctors, what will be the plan of action to treat this patient? Elaborate the steps using a flow chart.

b) Name any two biopolymers and discuss their origin, structure and biomedical applications. (2x5)

UNIT - II

V. a) Describe the composition of blood in detail by focusing on function of each cell type and enlist the biomedical options available for the replacement of blood?

b) Using a schematic discuss the steps in making of an artificial skin in laboratory till its entry into market for commercial use. (2x5)

VI. a) Classify the ocular drug delivery systems and mention advantages and disadvantages of each class.

b) Elaborate on the requirements of an ideal dental impression material. (2x5)

VII. a) Wound healing is a complex multistep process. Discuss all the steps in the process with the help of a labeled diagram.

b) Comment on composition properties and applications of contact lenses and optical implants. (2x5)

x-x-x