

Exam.Code:0910
Sub. Code: 6718

1019
B.E. (Biotechnology) Sixth Semester
BIO-615: Biomaterials

Max. Marks: 50

Time allowed: 3 Hours

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

x-x-x

I. Attempt the following:-

- a) Hardness is a measure of resistance against _____
- b) What is the difference between *in vivo* and *in vitro*?
- c) Name two materials used in skin repair.
- d) Define bioglass.
- e) The teeth and bones of the human body, mainly consist of this chemical substance _____.
- f) Draw the stress-strain curve for a ductile material.
- g) Give two examples of biodegradable polymers.
- h) In context of mechanical property of Biomaterials, tension refers to _____.
- i) Compatibility of a material with the blood is referred to as _____
- j) The fracture toughness of cancellous bone is _____ than cortical bone. (10x1)

UNIT - I

- II. a) Enlist the different mechanical properties of materials and discuss their application as biomaterials. (7,3)
- b) How can one improve the surface properties of metals?
- III. a) Discuss the classification of ceramic materials for bio-medical applications. (5,5)
- b) Explain how porosity and other characteristics can be controlled and measured in scaffolds.
- IV. a) Define medical tribology. (3,7)
- b) With reference to their specific properties and biomedical applications discuss any two synthetic polymers.

P.T.O.

(2)

UNIT – II

- V. a) Explain haemorheology. What materials can be used as blood substitutes?
b) Write about the types of failures that can occur in orthopedic implants. (4,6)
- VI. a) Describe the anatomy of a knee joint? What materials are used for the replacement and reconstruction of knee joints?
b) Write a note on the desirable properties of a material to be used for urological grafts. (7,3)
- VII. a) Explain the wound healing process.
b) How do vitreous implants improve the vision? Discuss the properties and different categories of contact lenses. (3,7)

x-x-x