

Exam.Code:1030
Sub. Code: 7857

1059
M.Tech. (Material Science and Technology)
Second Semester
MST-202: Ceramics and Bio-Materials

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 Unit.

x-x-x

I. Attempt the following:-

- a) Define the Dielectric & Ferroelectric property of a ceramic
- b) What is the difference between annealing and quenching
- c) What makes biomaterial biocompatible
- d) Give one example each of degradable and non-degradable polymer
- e) How the Ceramic Composites' (CMCs) are different from conventional ceramics (5x2)

UNIT - I

- II. a) What is the theory of superconductivity and discuss the application of superconducting material.
- b) Discuss the Molybdenum-Manganese/Nickel plating method in the synthesis of metalized ceramics. (2x5)
- III. Discuss synthesis, Structure, properties and application of silicon nitride (10)
- IV. a) Justify the difference between Dielectric, Paraelectric and Ferroelectric polarization with the help of Hysteresis loops
- b) Discuss how the magnetic properties can be tuned on the basis of structural parameters in Garnets (2x5)

UNIT - II

- V. a) Describe in short, structure and functions of collagen.
- b) Explain briefly various components of blood. (2x5)
- VI. a) Explain rapid prototyping of biomaterials.
- b) Why 316L stainless steel is considered to be the most suitable biomaterial, justify your answer with reasons. (2x5)
- VII. Discuss the structure, properties and degradation of (a) Collagen (b) Cellulose (10)

x-x-x