

Exam.Code:1030  
Sub. Code: 7550

2063

M. Tech. (Material Science and Technology)  
Second Semester  
MT-205: Ceramics and Biomaterials

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 any five of the following:-

- a) What is the difference between conventional ceramics and ceramic composites?
- b) Give examples of any two biomaterials used for human body.
- c) What are superconducting ceramics?
- d) Name two methods of testing of biomaterials.
- e) Give two examples of piezoelectric ceramics.
- f) What do you understand by ECM in tissue engineering? Which synthetic material can act as its replacement? (5x2)

**UNIT - I**

- II. a) What is the principle of Ferroelectricity? Explain temperature dependent surface structure of BaTiO<sub>3</sub> Discuss the applications of ferroelectric ceramics.  
b) Discuss garnet processing and its applications. (7,3)
- III. a) What are glass ceramics? Mention their applications.  
b) Write short notes on i) Carbides ii) silicides. (2x5)
- IV. a) Explain what are i) PLZT sensors ii) Spinel ferrites.  
b) What do you understand by structural ceramics? Why are they superior to metals? Justify your answer with the help of suitable examples. (2x5)

**UNIT.- II**

- V. a) What are hydrogels? How have hydrogels revolutionized the field of drug delivery?  
b) Explain what are biomaterials citing suitable examples. (2x5)

P.T.O.



(2)

- VI. a) Natural biodegradable polymers are called biopolymers. Explain their advantages using examples.
- b) Give a brief overview of the design of a biosensor and cite two examples. (2x5)
- VII. a) Discuss tissue response to implanted biomaterial.
- b) Elucidate protein structure and the interaction of protein with synthetic materials. (2x5)

x-x-x