

# 22219

**23124**

**3 Hours / 70 Marks**

Seat No. 

--	--	--	--	--	--	--	--

- Instructions* – (1) All Questions are *Compulsory*.  
(2) Illustrate your answers with neat sketches wherever necessary.  
(3) Figures to the right indicate full marks.  
(4) Assume suitable data, if necessary.  
(5) Mobile Phone, Pager and any other Electronic Communication devices are not permissible in Examination Hall.

**Marks**

- 1. Attempt any FIVE of the following: **10****
- a) Define biocompatibility.
  - b) List any two biomedical application of stainless steel.
  - c) Define the term is annealing.
  - d) Draw stress strain-curve for ductile material.
  - e) State the need of artificial pacemaker.
  - f) Choose the following implant which are related to contact lenses.
    - i) Dental
    - ii) Ophthalmic
    - iii) Orthopedic
    - iv) Cardiovascular
  - g) Give the composition of Enamel and dentin in teeth.

P.T.O.

- 2. Attempt any THREE of the following:** **12**
- a) Give the four properties of Zirconia
  - b) Draw any two self-tapping dental implant.
  - c) Explain types of sutures.
  - d) Draw and explain the contact angle method for surface analysis.
- 3. Attempt any THREE of the following:** **12**
- a) State the composition of Ti-based alloy.
  - b) Divide the following implant in two category that is orthopedic implant and dental implant.
    - i) Endosseous implant
    - ii) Fixation devices
    - iii) Filling material
    - iv) Intramedullary nails.
  - c) Explain the concept of tissue grafting.
  - d) List the application of hydrogel (any four).
- 4. Attempt any THREE of the following:** **12**
- a) Describe the different stages in Bone healing process.
  - b) State two properties and application of silicon rubber.
  - c) Draw the structure of long bone.
  - d) State the need of ophthalmic implant.
  - e) Relate the following application with stainless steel alloy. Ti-based alloy.
    - i) Bone plate
    - ii) Hip - prostheses
    - iii) Cardiac - Pacemaker
    - iv) Screws.

- 5. Attempt any TWO of the following: 12**
- a) Define the term corrosion and wear and list the type of wear.
  - b) List different materials used for filling and restoration of deep cavities.
  - c) List the types of polymer and draw the different types of polymeric chain.
- 6. Attempt any TWO of the following: 12**
- a) Define the term Biomaterials and classify the biomaterial in brief.
  - b) Explain knee joint repair.
  - c) Identify the Biomaterials for following applications and list their any two properties.
    - i) Contact lenses
    - ii) Wound dressing
-