

# 22219

**21819**

**3 Hours / 70 Marks**

Seat No.

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- Instructions* – (1) All Questions are *Compulsory*.  
(2) Answer each next main Question on a new page.  
(3) Illustrate your answers with neat sketches wherever necessary.  
(4) Figures to the right indicate full marks.  
(5) Assume suitable data, if necessary.  
(6) 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) Draw atomic and molecular bonds.
  - b) List any two application of stainless steel alloy.
  - c) List four uses of biomaterial.
  - d) Draw crystal structure of solid .
  - e) Define pacemaker.
  - f) Give two application of Mitinol.
  - g) Draw bone healing curve.
- 2. Attempt any THREE of the following: 12**
- a) Give two properties and two applications of hydrogen.
  - b) List factors affecting in bone formation
  - c) List any four material used for suture.
  - d) Define Corrosion. Explain any two types.

P.T.O.

- 3. Attempt any THREE of the following:** **12**
- a) State bio-logical tolerance of implant metal:
    - (i) Mitinol
    - (ii) Titanium
  - b) Name any two orthopedic and dental implants.
  - c) Describe the testing & evaluation process for dental implants.
  - d) List application of silicon rubber.
- 4. Attempt any THREE of the following:** **12**
- a) Draw neat sketch of total knee replacement.
  - b) List two properties and two application of carbon.
  - c) List any three uses of collagen in dentistry.
  - d) State need of orthopedic implants.
  - e) Relate the following application with stainless-steel alloy Ti based alloy:
    - (i) long bone shaft
    - (ii) bone plate
    - (iii) cardiac cage valve
    - (iv) Fumur ball.
- 5. Attempt any TWO of the following:** **12**
- a) Explain total hip replacement
  - b) Describe testing of bio-material
  - c) Give any two properties and applications of acrylic and biodegradable polymers.
- 6. Attempt any TWO of the following:** **12**
- a) List types of polymers. Give two applications and properties of alumina.
  - b) Draw and explain stress- strain curve in detail.
  - c) Give any four mechanical properties of teeth and enlist filling and restoration materials for deep cavities.
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