

17543

21819

3 Hours / 100 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. a) Attempt any THREE of the following: 12
- (i) Define the terms:
 - 1) Atomic bond
 - 2) Molecular bond.
 - (ii) Define biomaterial and classify ceramic material.
 - (iii) Draw neat labelled structure of Heart.
 - (iv) List any four mechanical properties of teeth.
- b) Attempt any ONE of the following: 6
- (i) List uses of collagen in dentistry.
 - (ii) Explain natural healing process with diagram.

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- 2. Attempt any FOUR of the following:** **16**
- a) Draw any two crystal structure of solid materials.
 - b) Explain the concept of sterilization.
 - c) Write composition of stainless steel.
 - d) List any four properties of Alumina.
 - e) Explain blood circulation in the body with neat diagram.
 - f) Explain testing and evaluation process of dental implant.
- 3. Attempt any FOUR of the following:** **16**
- a) Explain contact angle method used in surface analysis.
 - b) Explain methods for testing of biomaterials.
 - c) Write any four applications of silicon rubber.
 - d) Describe structure of lungs with neat labelled diagram.
 - e) List materials used for total hip replacement.
- 4. a) Attempt any THREE of the following:** **12**
- (i) Describe electro kinetic theory.
 - (ii) Write any four properties of Nitinol.
 - (iii) Write functions of kidney. (any four)
 - (iv) List factors affecting bone formation and resorption.
- b) Attempt any ONE of the following:** **6**
- (i) Explain reimplantation of natural teeth and draw various designs of self- tapping dental implants.
 - (ii) Explain the process of total hip replacement and draw total hip replacement devices.

5. Attempt any FOUR of the following:**16**

- a) Explain stress. Strain curve with diagram.
- b) Write biological tolerance of implant metals (any four).
- c) Write any four applications of hydrogel.
- d) Explain total Knee joint replacement.
- e) Write any four properties of carbon.
- f) Write mechanical properties of bone.

6. Attempt any FOUR of the following:**16**

- a) Draw and explain structure of typical bone.
 - b) Draw labelled structure of eye.
 - c) State the function of eye shields and list materials used for optical implant.
 - d) List prosthetic heart valves and sketch any two.
 - e) Write need of cardiac pacemaker.
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