

17543

11920

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) List any four historical developments of biomaterial.
 - (ii) Give composition of stainless steel.
 - (iii) State need of cardiac pacemaker.
 - (iv) Give materials name used in filling and restoration in tooth.
- b) Attempt any ONE of the following: 6
- (i) Sketch schematic diagram of a tooth. Give its mechanical properties.
 - (ii) Explain natural bone healing process with sketch.

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2. **Attempt any FOUR of the following:** **16**
- a) Classify ceramic biomaterial.
 - b) Explain contact angle method with sketch.
 - c) Give four applications of silicon rubber.
 - d) Explain corrosion rate measurement with sketch.
 - e) Sketch schematic diagram of blood circulation in the body. Explain the same.
 - f) Explain testing and evaluation of dental implants.
3. **Attempt any FOUR of the following:** **16**
- a) Explain crystal structure of solids.
 - b) List atomic and molecular bonds. Sketch any one.
 - c) Give any two biomedical applications of following:
 - (i) Silicon Rubber
 - (ii) Hydrogel
 - d) Draw structure of kidney. List its any two functions.
 - e) List total hip replacement devices. Sketch any two.
4. a) **Attempt any THREE of the following:** **12**
- (i) Explain stress strain behavior with sketch.
 - (ii) Explain process of metallic corrosion.
 - (iii) Explain structure of lungs with sketch.
 - (iv) Explain process of total hip replacement.
- b) **Attempt any ONE of the following:** **6**
- (i) List materials used in dental implants and explain use of collagen in dentistry.
 - (ii) Sketch structure of typical bone. Give its mechanical properties.

- 5. Attempt any FOUR of the following:** **16**
- a) Explain concept of corrosion and wear.
 - b) List mechanical properties of carbon.
 - c) List any four applications of Alumina.
 - d) State the use of temporary fixation devices with examples.
 - e) Explain any four biological tolerance of implant metals.
 - f) List biomaterials used in TJR
- 6. Attempt any FOUR of the following:** **16**
- a) List factors affecting bone formation and resorption.
 - b) Sketch structure of eye.
 - c) Explain importance of eye shields.
 - d) List types of dialyzers. Sketch only one
 - e) Differentiate between intrinsic and extrinsic blood clot formation.
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