

17543

16172

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.

Marks

1. (A) Attempt any THREE : 12
- (a) List four properties of biomaterials.
 - (b) Give composition & two applications of stainless steel.
 - (c) Draw the labelled structure of biological kidney.
 - (d) List four mechanical properties of dentine.
- (B) Attempt any ONE of the following : 6
- (a) State the composition of teeth. Draw schematic neat labelled diagram of tooth.
 - (b) Draw & describe neat sketches of different devices used to assist healing of broken bone.
2. Attempt any FOUR : 16
- (a) State the Hook's law & Poisson's ratio.
 - (b) Give composition & two properties of Cr alloy.
 - (c) List two properties and three applications of alumina.
 - (d) State the procedure & evaluation of dental implants.
 - (e) List two types of dialyzers & draw two among them.
 - (f) Draw the diagram of contact angle to measure surface properties. Describe Young – Dupree equation.

- 3. Attempt any FOUR :** **16**
- (a) Define biomaterials & give two examples.
 - (b) Draw the schematic of metallic corrosion & state anodic & cathodic reaction.
 - (c) Draw structure of artificial kidney & give its two functions.
 - (d) List four applications of acrylic polymers.
 - (e) List factors affecting bone formation resorption.
- 4. (A) Attempt any THREE :** **12**
- (a) Describe electrokinetic theory used in surface analysis.
 - (b) List four properties & two applications of Zirconia.
 - (c) State two types of blood clot formation technique & differentiate them.
 - (d) Draw diagram of cellular events in bone healing.
- (B) Attempt any ONE :** **6**
- (a) State the meaning of reimplantation of teeth. Draw various design of self tapping dental implants.
 - (b) Sketch graphically bone healing assisted by resorbable bone plate & explain it.
- 5. Attempt any FOUR :** **16**
- (a) List three different types of Chemical bond. Also draw their sketches.
 - (b) List Four methods to improve blood compatibility and also comments on it.
 - (c) Comment on electrical stimulation of bone healing.
 - (d) List two properties & two biomedical applications of Ti based alloy.
 - (e) Draw diagram of :
 - (i) Total knee replacement parts
 - (ii) Comments on a total knee replacement.
 - (f) State the meaning of Hydrogel. Draw its structure & give its two properties.

6. Attempt any FOUR :**16**

- (a) List ceramic & polymer material used in TJR & list application of same.
 - (b) State the concept of artificial implants of eye.
 - (c) Draw cross section of eye showing posterior chamber lens fixation & list the material used.
 - (d) List types of prosthetic valve & biomaterials used for same.
 - (e) Draw structure & four function of lungs.
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