

17543

16117

3 Hours / 100 Marks

Seat No.

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- 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.

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| 1. (A) Attempt any THREE : | 12 |
| (a) List any four mechanical properties of biomaterial. | |
| (b) List any four properties of carbon. | |
| (c) Draw schematic diagram of blood circulation in the body. | |
| (d) State mechanical properties of teeth. | |
| (B) Attempt any ONE : | 06 |
| (a) Explain the use of collagen in dentistry. | |
| (b) Draw and explain structure of typical bone. | |
| 2. Attempt any FOUR : | 16 |
| (a) List any four features of surface of material. | |
| (b) Draw neat labelled stress-strain curve for ductile material. | |
| (c) Explain corrosion rate measurement in detail. | |
| (d) Explain biological tolerance of any four implant metals. | |
| (e) Explain two routes for blood clot formation. | |
| (f) Write note on materials for deep cavities. | |

- 3. Attempt any FOUR :** **16**
- (a) Explain the concept of corrosion.
 - (b) Write note on testing of biomaterials.
 - (c) Write any four applications of acrylic polymers.
 - (d) Explain blood compatibility of synthetic vascular implant materials.
 - (e) List different biomaterials used in total joint replacement.
- 4. (A) Attempt any THREE :** **12**
- (a) Describe contact angle technique used in surface analysis.
 - (b) Enlist properties of alumina and zirconia.
 - (c) Draw and explain structure of heart.
 - (d) Write note on knee joint repair.
- (B) Attempt any ONE :** **6**
- (a) Write the procedure for testing the reliability of dental implant and list the materials used in porous dental implant.
 - (b) Enlist different mechanical properties of bone. Also explain cellular events in bone healing.
- 5. Attempt any FOUR :** **16**
- (a) Enlist three imperfections in crystal and sketch any one.
 - (b) Classify polymers. List uses of any one type of polymer.
 - (c) Enlist applications of silicon, rubber and elastic.
 - (d) What are different total hip replacement devices ? Explain any one.
 - (e) List properties of stainless steel and nitinol.
 - (f) List factors affecting bone formation and resorption.

6. Attempt any FOUR :**16**

- (a) Write note on bone regeneration with resorbable material.
 - (b) List different types of biomaterials used for optical implants.
 - (c) Explain structure of eye.
 - (d) Enlist different types of dialyzers. Draw neat sketch of any one type.
 - (e) Draw structure of kidney and give functions of it.
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