

17543

11819

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 Bond's present in Biomaterials. | |
| (b) List any four properties of alumina. | |
| (c) List different types of dialyzers & draw any one. | |
| (d) List the materials used for Filling & Restoration. | |
| (B) Attempt any ONE : | 6 |
| (a) Describe the testing and evaluation procedure for dental implants. | |
| (b) Describe the structure of typical bone with its diagram. | |
| 2. Attempt any FOUR : | 16 |
| (a) Describe contact angle technique used in surface analysis. | |
| (b) Draw neat labelled stress-strain curve and explain it. | |
| (c) Give composition and any two properties of Nitinol. | |
| (d) Explain the biological tolerance of any four implant metals. | |
| (e) Describe intrinsic pathway of formation of blood clot. | |
| (f) Give composition of teeth. Give its mechanical properties. | |

- 3. Attempt any FOUR :** **16**
- (a) Give classification of biomaterials.
 - (b) Write a note on testing of biomaterials.
 - (c) Give any two biomedical applications of following polymers :
 - (i) hydrogel
 - (ii) carbon
 - (d) List four types of prosthetic heart valves and draw any two of them.
 - (e) List different materials used for total joint replacement.
- 4. (A) Attempt any THREE :** **12**
- (a) Describe electrokinetic theory in surface analysis.
 - (b) Write any four applications of silicon rubber.
 - (c) Draw neat labelled diagram of heart.
 - (d) Describe the concept of bone healing.
- (B) Attempt any ONE :** **6**
- (a) List any four applications of collagen in dentistry.
 - (b) Write a short note on knee-joint repair.
- 5. Attempt any FOUR :** **16**
- (a) List three imperfections in crystal and sketch any one.
 - (b) Enlist the properties of zirconia and write any two applications of it.
 - (c) Give any four biomedical applications of stainless steel.
 - (d) Write a short note on temporary fixation device.
 - (e) Metals are less biocompatible than polymers. Justify your answer.
 - (f) Give mechanical properties of bone.
- 6. Attempt any FOUR :** **16**
- (a) Draw figure of bone healing assisted by resorbable bone plate and describe it.
 - (b) Draw structure of eye.
 - (c) State the function of eye-shield and list polymers used for optical implant.
 - (d) State the need of cardiac pacemaker.
 - (e) Draw a neat labelled structure of kidney.
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