

AU – 2731

Fifth Semester B. E. (Biomedical Engineering) Examination

PRINCIPLES OF BIOMATERIALS AND BIOMECHANICS

Paper – 5 FEBM 05

(USC – 10120)

P. Pages : 3

Time : Three Hours]

[Max. Marks : 80

- Note :** (1) Separate answer book must be used for each section in the subject Geology, Engineering material of civil branch and Separate answer book must be used for Section A and B in Pharmacy and Cosmetic Tech.
(2) Answer **Three** questions from Section A and **Three** questions from Section B.
(3) Illustrate your answer wherever necessary with the help of neat sketches.
(4) Use pen of Blue/Black ink/refill only for writing the answer book.

SECTION A

1. (a) Write short notes on :

- (i) Polymers.
- (ii) Plastics.
- (iii) Metallic.
- (iv) Ceramic Materials.
- (v) Carbon and polymers.
- (vi) Absorbable.
- (vii) Porous Biomaterials.

14

OR

2. (a) Distinguish between Metallic and ceramic materials. And also explain the polymers and plastics. 8
- (b) Explain plasticity and inelasticity in detail. 6

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3. (a) Explain properties of Metallic and ceramic Bio materials in detail. 7
(b) What are the factor influencing for polymer properties. 6

OR

4. (a) Write short notes on :—
(i) Polymer compatibility.
(ii) Polymer Degradation. 6
(b) Explain the polypropylene, silicones rubber And hydro gets in detail. 7
5. (a) What are the types of orthopedic function devices and explain in detail. 7
(b) Explain the Alveolar bone replacements and orthopedic implants. 6

OR

6. (a) Explain the following concepts :
(i) Hip Joints.
(ii) Bone cement.
(iii) Biological Testing Materials. 13

SECTION B

7. (a) Explain general principles of Bio Mechanics in detail. 8
(b) What are the heart assist devices and explain in detail ? 6

OR

8. (a) Explain the following points :
(i) Cardio vascular.
(ii) Pulmonary mechanics.
(iii) Rheology of blood circulation system.
(iv) Strain in Biological tissues. 14

9. (a) Explain strain and ramp ascent and descent in detail. 6
(b) What are the classifications in prosthetics and orthotics lower extremity orthoses ? 7

OR

10. (a) Write short notes on :
(i) Body and limb mass.
(ii) Gait Analysis. 7
(b) Slow normal and fast gait on the level system is explain in detail. 6
11. (a) Write the difference between total contact and partial weight relieving. 6
(b) What is the principles of three point pressure and total contact ? Explain in detail. 7

OR

12. (a) Explain the purpose for providing prostheses and orthoses. 6
(b) What is the anatomical axis ? Explain the positions of anatomical axis give the examples. 7



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