

B.E. Fourth Semester (Biomedical Engineering) (CGS)
10110 : Biomaterial and Biomechanics : 4 BM 05

P. Pages : 2

Time : Three Hours



AU - 2611

Max. Marks : 80

- Notes :
1. All question carry equal marks.
 2. Answer **three** question from Section A and **three** question from Section B.
 3. Due credit will be given to neatness and adequate dimensions.
 4. Illustrate your answer necessary with the help of neat sketches.
 5. Use of pen Blue/Black ink/refill only for writing the answer book.

SECTION - A

1. a) Explain about the importance of stress corrosion cracking? 7
b) Discuss about the orthopedic implants in detail. 6

OR

2. a) What is biomaterials? What are the requirements of biomaterials? Classifications of biomaterials? 7
b) Explain the importance of passive films for tissue adhesion? 6
3. a) What are mechanics of improvement of properties by incorporating different elements? 7
b) Discuss about the polymers in medical use? 6

OR

4. a) Write the properties of fibers used for composite materials? 7
b) Discuss about the polymers & polymeric implant materials? 6
5. a) Explain : 10
a) In Vivo Testing
b) Ex Vivo Testing
b) Write about the effects of sterilization on material properties? 4

OR

6. a) Define : 10
a) Blood Compatibility.
b) Biocompatibility
c) Tissue Compatibility
b) Discuss how toxicity tests are carried out. 4

SECTION - B

7. a) Explain Maxwell & Voigt models in detail. 7
b) Write down the mechanical properties of the bone? 6

OR

8. Discuss the physical & mechanical properties of the following : 13
a) Teeth
b) Collagen rich tissues,
c) Cancellous bones

9. a) Explain : 9
a) Mechanics of hip
b) Mechanics of elbow
c) Mechanics of shoulder

- b) Explain the mechanics of shoulder & spinal column? 5

OR

10. a) What are the basic considerations & assumptions for biomechanics of skeletal joints & skeletal muscles? 9

- b) Discuss about the forces & stresses in human joints? 5

11. a) Enlist the natural & artificial heart valves along with their applications. 6

- b) Define a movement & locomotion? Discuss about the various types movements by skeletal muscles? 7

OR

12. Define : 13

a) Capillary Viscometer

b) Laminar Flow.

c) Viscosity

d) Turbulent Flow.
