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Question Paper Code: 56B03

B.E. / B.Tech. DEGREE EXAMINATION, NOV 2019

Sixth Semester

Biomedical Engineering

15UBM603- BIOMECHANICS

(Regulation 2015)

Duration: Three hours

Maximum: 100 Marks

Answer ALL Questions

PART A - (10 x 1 = 10 Marks)

1. The branch of mechanics that describes the cause of force is _____. CO1- R
(a) Kinetics (b) Kinematics (c) Biomechanics (d) Fluid mechanics
2. Which of the following defines center of gravity? CO1- R
(a) Intersection of the 3 cardinal planes
(b) The point around which a body's weight is equally balanced regardless of body position
(c) Both A & B
(d) Neither A nor B
3. Number of bones in the axial skeleton is _____. CO2- R
(a) 60 (b) 80 (c) 40 (d) 20
4. How many of the bones of the human skeleton engage in voluntary movement? CO2- R
(a) 206 (b) 200 (c) 177 (d) 150
5. Strongest ligament of the hip joint is _____. CO3- R
(a) pub femoral (b) Ileo femoral (c) Ischio femoral (d) femur fracture

6. Identify the major tissues in a synovial joint. CO3- R
- (a) Ligamentous joint capsule, hyaline cartilage, synovial membrane, synovial fluid
 (b) Ligamentous joint capsule, fibro cartilage, synovial membrane, synovial fluid
 (c) Cartilaginous joint capsule, hyaline cartilage, synovial membrane, synovial fluid
 (d) Cartilaginous joint capsule, fibro cartilage, synovial membrane, synovial fluid
7. Which of the following planes of the body divides it into upper and lower parts? CO4- R
- (a) Saginaw (b) Transverse (c) Frontal (d) Vertical
8. Find Partial Pressures (in mm Hg) of Oxygen and Carbon dioxide at Alveoli involved in Diffusion in Comparison to those in Atmosphere. CO4- R
- (a) 159&0.3 (b) 104&40 (c) 40&45 (d) 95&40
9. Blood vessels are known to retract both _____and _____after excision. CO5- R
- (a) Longitudinally and circumferentially (b) Horizontally and Vertically
 (c) Cylindrically and Circumferentially (d) Mechanically and Electrically
10. An athlete covering 100 m distance in 10 seconds, ran at a speed of ____ CO5- R
- (a) 10 m/s (b) 100 m/s (c) 20 m/s (d) 1000 m/s

PART – B (5 x 2= 10 Marks)

11. Differentiate kinetics and kinematics. CO1- R
12. List any two fracture fixators. CO2- R
13. Define patellar Subluxation. CO3- R
14. Define Alveoli mechanics. CO4- R
15. Infer the physics of cardio vascular diseases. CO5- R

PART – C (5 x 16= 80 Marks)

16. (a) (i) Outline the steps in analyzing a biomechanical problem CO1- U (10)
 (ii) Differentiate between rigid and non rigid bodies CO1- U (6)
- Or
- (b) Discuss in detail about the steps involved in analyzing biomechanical problem along with graphical methods for representation. CO1- U (16)
17. (a) Illustrate the structure, composition and mechanical properties of bone CO2- U (16)

Or

- (b) Explain the structure, function and mechanical properties of skin, ligaments and tendons. CO2- U (16)
18. (a) Outline the biomechanics of elbow, shoulder and spinal column with the help of a simple model. CO3- Ana (16)
- Or
- (b) (i) Elucidate the Knee prosthesis with neat sketches. CO3- Ana (8)
(ii) Explain the mechanics of Synovial Joint with neat diagram. CO3- Ana (8)
19. (a) Illustrate the Pressure-Volume curve of the respiratory system. CO4- U (16)
- Or
- (b) Consider any two lung diseases and explain their physics with suitable illustrations. CO4 - U (16)
20. (a) Compare the mechanical properties of arteries, arterioles, capillaries and veins. CO5- U (16)
- Or
- (b) (i) With neat diagram explain in detailed about prosthetic heart valves and replacement CO5- U (8)
(ii) Differentiate laminar and turbulent flow. CO5- U (8)

