A **Reg. No. :** | | | | | | | | | | |

Question Paper Code: 56B03

B.E. / B.Tech. DEGREE EXAMINATION, APRIL 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 theory attributing propulsion in swimming to Newton's third law is what? CO1- R

   (a) The propulsive drag theory (b) The propulsive lift theory

   (c) The vortex theory (d) None of the above

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. Find the false statement from the following. CO2- R

   (a) The hip is distal to the knee

   (b) The shoulder is superior to the hip

   (c) Superficial muscles are closer to the skin than deep muscles

   (d) The triceps are posterior to the biceps

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. _____ can never be treated as a hinge joint. CO3- R

(a) The elbow (b) The Knee (c) The Wrist (d) The Ankle

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. Alveoli are the primary sites of _____ of gases. CO4- R

(a) Exchange (b) Transport (c) Obstruction (d) Blockage

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. Mitral valve is present between_____. CO5- R

(a) Right atrium & left ventricle (b) Right atrium& right ventricle

(c) Left atrium & left ventricle (d) Left atrium& right ventricle

PART – B (5 x 2= 10 Marks)

11. What is Biomechanics? CO1- R

12. List any two fracture fixators. CO2- R

13. Define patellar Subluxation. CO3- R

14. Reveal any four lung volumes during respiration cycle. CO4- R

15. Mention any two diseases that are caused due to change in blood flow properties. CO5- R

PART – C (5 x 16= 80 Marks)

16.	(a)	Explain the Kinetics concepts for analyzing human motion with apt sketches.	CO1- U	(16)
		Or		
	(b)	Discuss in detail about the steps involved in analyzing biomechanical problem along with graphical methods for representation.	CO1- U	(16)
17.	(a)	With a neat diagram explain in detail about the bone composition and its mechanical properties.	CO2- U	(16)
		Or		
	(b)	(i) Write short note on Damage analysis of bones with suitable illustrations.	CO2- U	(6)
		(ii) Analyze the appropriate differences among the biomechanical principles in the Head injury tolerance and spine injury.	CO2- U	(10)
18.	(a)	Enumerate the gait analysis and goniometry with suitable sketches.	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)	Explain in detail about the breathing mechanism and airway resistances.	CO4- U	(16)
		Or		
	(b)	Consider any two lung diseases and explain their physics with suitable illustrations.	CO4 - U	(16)
20.	(a)	Explain the mechanical properties of four types of blood vessels with neat sketches.	CO5- U	(16)
		Or		
	(b)	(i) Differentiate Auto graft and Homograft related Prosthetic valve design.	CO5- U	(8)
		(ii) Differentiate Laminar and Turbulant flow techniques of body fluids with suitable sketches.	CO5- U	(8)