Total number of printed pages-8

34 (1) BIOM 1.4

2018

BIOMECHANICS

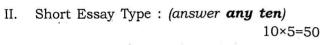
Full Marks: 100

Time: Three hours

The figures in the margin indicate full marks for the questions.

- I. Essay Type: (answer any two) 2×10=20
 - 1. Define lever and lever parameters. Explain about the orders of lever with suitable mechanical and anatomical examples.
 - 2. Explain in detail about bio-mechanics of cervical spine.
 - 3. Describe the mechanically related structural components of hip and discuss the stability of hip joint in single leg stance.

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- What is Centre of gravity? How does it vary with body position? Explain with examples.
- Explain the various joints present in the thorax.
- 3. Explain creep and stress-relaxation.
- 4. Kinematics of Temporomandibular ioint.
- 5. Static stabilization of shoulder.
- 6. Explain the role of intrinsic muscles of hand.
- 7. Mobility of Elbow joint.
- 8. Discuss Supination twist and pronation twist.
- Describe the biomechanics of sacroiliac joint.
- 10. Determinants of gait.
- 11. Screw-home mechanism.
- 12. Hand arches and their functions.



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 $5 \times 2 = 10$

- III. Short type: (answer any five) Agonist and antagonist
 - Claw toe and hammer toe 2.
 - Law of Inertia 3.
 - Coxa Valga 4.
 - Patella alta 5.
 - Posture (Definition and types) 6.
 - Role of Menisci. 7.
 - 20×1=20 IV. Multiple Choice Questions:
 - Which type of lever is used while we curl our biceps?
 - (a) Class I
 - (b) Class II
 - (c) Class III
 - (d) None of the above.
 - Elevation of the shoulder girdle takes place in which plane?
 - (a) Sagittal
 - (b) Frontal
 - Horizontal
 - (d) Transverse.

Contd.

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3.	In anatomical position, the elbows are
	while the radioulnar joints

are ____.

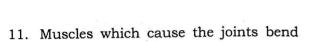
- (a) Extended/Supinated
- (b) Extended/Pronated
- (c) Flexed/Pronated
- (d) Flexed/Supinated.
- 4. Which of the following can never be treated as a hinge joint?
 - (a) The Elbow
 - (b) The Knee
 - (c) The Wrist
 - (d) The Ankle.
- 5. Which of the following corresponds to opening of the mouth?
 - (a) Mandibular Elevation
 - (b) Mandibular Depression
 - (c) Mandibular Protrusion
 - (d) Mandibular Retrusion.
- 6. Which of the following motions is a translatory motion?
 - (a) Inferior glide of MTP joint
 - (b) Flexion of Elbow joint
 - (c) A ball thrown by a baseball pitcher
 - (d) Abduction of shoulder joint.

- 7. The tibial plateau slopes posteriorly approximately
 - (a) 6° to 9°
 - (b) 7° to 10°
 - (c) 8° to 10°
 - (d) None of the above.
 - Lumbosacral angle in optimal erect posture
 - (a) 10°
 - (b) 20°
 - (c) 30°
 - (d) 40°.
 - During knee flexion quadriceps undergo —
 - (a) Concentric
 - (b) Eccentric
 - (c) Isometric
 - (d) Isotonic.
 - 10. Bursae located between skin and bone—
 - (a) Subtendinous
 - (b) Submuscular
 - (c) Subcutaneous
 - (d) None of the above.

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Contd.



(a) Flexors

are -

- (b) Extensors
- (c) Abductors
- (d) Adductors.
- 12. Synovial joint is -
 - (a) Slightly movable
 - (b) Freely movable
 - (c) Both (a) and (b)
 - (d) None of the above.
- 13. Which of the following is a fibrous joint?
 - (a) Joints of the skull
 - (b) Joints of fingers
 - (c) Joints of ribs
 - (d) All of the above.
- 14. A forward upward movement of the foot at the ankle joint is
 - (a) Plantar flexion
 - (b) Dorsiflexion
 - (c) Inversion
 - (d) Eversion.

- 15. Lordosis is also called -
 - (a) Round back
 - (b) Hollow back
 - (c) Lateral back
 - (d) Back curve.
- 16. Which of the following statement is NOT TRUE?
 - (a) Biomechanics is the application of mechanical principles in the study of any mechanical system.
 - (b) Kinesiology is the study of human movement.
 - (c) Kinematics is the study of description of motion regardless of force.
 - (d) Anthropometry is the study related to the dimensions and weights of a body segment.
- 17. Which statement is True?
 - (a) Degree of toe-out increases as speed of walking decreases in normal men.
 - (b) Degree of toe-out increases as speed of walking increases in normal men.
 - (c) Degree of toe-out decreases as speed of walking decreases in normal men.
 - (d) Degree of toe-out decreases as speed of walking increases in normal men.

Contd.

- 18. Angle of inclination of humerus is
 - (a) $110^{\circ} 120^{\circ}$
 - (b) $120^{\circ} 130^{\circ}$
 - (c) $130^{\circ} 150^{\circ}$
 - (d) $150^{\circ} 160^{\circ}$.
- 19. Classification of muscle based on role
 - (a) Agonists
 - (b) Agonist and Antagonists
 - (c) Synergists and Antagonists
 - (d) Agonist, Antagonists and Synergists.
- 20. Function of lateral collateral ligament of knee joint is to resist
 - (a) Valgus stress
 - (b) Varus stress
 - (c) Anterior translation of tibia
 - (d) Posterior translation of tibia.