34 (1) BIOM 1·4

2017

BIOMECHANICS

Full Marks : 100

Time : Three hours

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

I. Essay Type : *(Answer **any two**)* 10×2=20

1. Discuss various elements of muscle fiber. Explain isometric length tension relationship and force-velocity relationship in detail with necessary diagrams.

2. Explain the structure of cervical spine with a labelled diagram of vertebrae. Discuss kinematics and kinetics of cervical spine.

3. Discuss various postural synergies.

Contd.

II. Short Essay Type : *(Answer **any ten**)* 5×10=50

1. Define Gait. Explain phases of gait cycle.
2. Postural deviations from optimal alignment in sagittal plane.
3. Write about precision handling and its types.
4. Structure and fucntion of Sabtalar joint.
5. Scapulohumeral Rhythm.
6. Role of rotator cuff muscles in dynamic Glenohumeral stabilization.
7. Joint distraction and joint compression.
8. Kinematics of the rib cage.
9. Explain unilateral stance with holding cane on the unaffected side.
10. Explain pathological gait with examples.
11. Lever system.
12. Structure and function of Radioulnar joint.

III. Short Answer type : *(Answer **any five**)* 5×2=10

1. Coracoacromial arch
2. Carrying angle
3. Nutation and Counter-nutation
4. Muslces of ventilation
5. Antiversion and Retroversion
6. Movements of TMJ
7. Anatomical Pulley.

IV. Multiple Choice Questions : 20×1=20

1. Corpal joint is the example of—
   (a) Pivot joint
   (b) Condyloid joint
   (c) Hinge joint
   (d) Ball and socket joint.

2. Which of the following planes of the body divides it into upper and lower parts ?
   (a) Saggital plane
   (b) Transverse plane
   (c) Frontal plane
   (d) Vertical plane.

3. Muslces which cause the joints to bend are
   (a) Flexors
   (b) Extensors
   (c) Abductors
   (d) Adductors.

4. Example of synorial joint is
   (a) Suture
   (b) Knee joint
   (c) Intervertebral disc
   (d) Shoulder joint.

5. The imaginary line passing laterally from one side to other is called
   (a) Saggital axis
   (b) Vertical axis
   (c) Coronal axis
   (d) None.

6. In isometric contraction, the muscle
   (a) Shortens
   (b) Lengthens
   (c) Neither shortens nor lengthens
   (d) Shortens as well as lengthens.

7. In which type of lever, the force is in betwen weight and fulcrum ?
   (a) First class
   (b) Second class
   (c) Third class
   (d) All of above.

8. Which of the following is a ball and socket variety of joint ?
   (a) Hip joint
   (b) Shoulder joint
   (c) Both (a) and (b)
   (d) Ankle joint.

9. During elevation of arm, which of the following muscle is involved ?
   (a) Biceps
   (b) Triceps
   (c) Deltoid
   (d) Pronator teres.

10. Bending of trunk in forward direction is an example of movement in
    (a) Frontal plane
    (b) Transverse plane
    (c) Saggital plane
    (d) None.

11. During gait cycle the percentage of stance phase and swing phases are
    (a) 80% and 20%
    (b) 60% and 40%
    (c) 50% and 50%
    (d) 70% and 30%.

12. Which of the following is a flat bone?
    (a) Fibula
    (b) Sacrum
    (c) Sternum
    (d) Ulna.

13. The basic unit of contraction is
    (a) Myosin
    (b) Actin
    (c) Z-lines
    (d) Sarcomeres.

14. The state of cquilibrium demonstrated when an object's COG is unchanged when it is disturbed is
    (a) Stable equilibrium
    (b) Unstable equilibrium
    (c) Neutral equilibrium
    (d) None.

15. A gait pattern characterized by a wide base of support and unsteady movements is called
    (a) Parkinson's gait
    (b) Scissors gait
    (c) Ataxic gait
    (d) Antalgic gait.

16. Which of the following joint is a fibrous joint?
    (a) Joints of skull
    (b) Joints of fingers
    (c) Joints of ribs
    (d) All of above.

17. Lateral bending of spine is known as
    (a) Lordosis
    (b) Kyphosis
    (c) Scoliosis
    (d) None.

18. The bone cells which are involved in building of bones are

(a) Osteoblasts

(b) Osteoclasts

(c) Osteocytes

(d) None.

19. The anatomical plane which divide the body into two equal halfs-halves

(a) Transverse plane

(b) Saggital plane

(c) Coronal plane

(d) Both (a) and (b).

20. Which of the following deformity develops in frontal plane ?

(a) Genu valgum

(b) Genu varum

(c) Both (a) and (b)

(d) Genu recurvatum.