

Total number of printed pages-8

34 (1) BIOM 1-3

2018

**BIOMECHANICS**

(Compt)

Full Marks : 100

Time : Three hours

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

- I. Essay type : (*answer any two*)  $2 \times 10 = 20$
1. Write in details about analysis of posture.
  2. Explain biomechanics of Thorax and Chest wall.
  3. Explain the structure and component of the Shoulder Complex. Explain dynamic stabilization in details.
- II. Short essay type : (*answer any ten*)  $10 \times 5 = 50$
1. Properties of connective tissues.

Contd.

2. Describe Joint Lubrication Model.
3. Describe the types of Joints.
4. Lumbo-Pelvic Rhythm.
5. Explain levers in details.
6. Sitting to standing—movement analysis.
7. Different types of grip.
8. Functional position of wrist and hand.
9. Describe stress and strain.
10. Explain Newton's Law of Motion.
11. Explain the parts of goniometer and its types.
12. Compare and contrast — different muscle contractions.

III. Short type : (answer **any five**)  $2 \times 5 = 10$

1. Carrying Angle
2. Scoliosis
3. Concurrent force system
4. Patella Plica
5. Pes planus and Pes cavus

6. Palmar Arches

7. Pulleys.

IV. Multiple choice questions :  $20 \times 1 = 20$

1. Which is not a saddle joint ?

- (a) Carpometacarpal of thumb
- (b) Ankle
- (c) Sternoclavicular
- (d) Acromioclavicular

2. Normal carrying angle —

- (a)  $0-20^\circ$
- (b)  $0-30^\circ$
- (c)  $0-10^\circ$
- (d)  $0-40^\circ$

3. Which class of lever is of power ?

- (a) 1st
- (b) 2nd
- (c) 3rd
- (d) 2nd and 3rd

4. A pathological increase of neck shaft angle is known as—

- (a) Coxa Vara
- (b) Coxa Valga
- (c) Femoral Anteversion
- (d) Femoral Retroversion.

5. Inversion Eversion component is more in

- (a) Ankle Joint
- (b) Mid Tarsal Joint
- (c) Sub Talar Joint
- (d) None.

6. Stance phase is \_\_\_\_\_ of gait cycle.

- (a) 40%
- (b) 50%
- (c) 60%
- (d) 70%

7. Which knee joint ligament helps in locking?

- (a) ACL
- (b) PCL
- (c) LCL
- (d) Posterior Capsule

8. Which is not included in Pes analysis?

- (a) Gracilis
- (b) Semi Membranosus
- (c) Semi Tendinosus
- (d) Sartorius.

9. Which is the most important muscle to produce upward rotation of scapula?

- (a) Serratus Anterior
- (b) Trapezius
- (c) Lovator scapulac
- (d) Deltoid.

10. Weight of HAT is about \_\_\_\_\_ of body weight.

- (a) 40%
- (b) 50%
- (c) 60%
- (d) 70%

11. COG of adult human in anatomical position is slightly

- (a) Anterior to S<sub>1</sub> vertebra
- (b) Posterior to S<sub>1</sub> vertebra
- (c) Anterior to S<sub>2</sub> vertebra
- (d) Posterior to S<sub>2</sub> vertebra.

12. Minimum muscle force is required when the joint is on

- (a) Closed Pack Position
- (b) Loose Pack Position
- (c) In between close and loose pack position
- (d) In Extension.

13. Biceps Brachii muscle as an elbow flexor is most effective at \_\_\_\_\_ elbow flexion range.

- (a) 45°
- (b) 60°
- (c) 90°
- (d) 120°

14. Apart from hip abductors which other muscles in the hip joint contribute to stability in bilateral stance?

- (a) Extensors
- (b) Adductors
- (c) Rotators
- (d) Flexors

15. Extensor retinaculum in the knee joint is

- (a) A part of capsule
- (b) A part of extensor mechanism
- (c) A part of quadriceps Tendon
- (d) None.

16. Static stabilization of glenohumeral articular surface is provided by

- (a) Coraco humeral ligament
- (b) Coraco clavicular ligament
- (c) Superior joint capsule
- (d) Coraco humeral ligament and superior joint capsule.

17. Which is the commonest ligament injury in ankle?
- (a) Calcaneo fibular
  - (b) Anterior Talofibular
  - (c) Posterior Talofibular
  - (d) LCL
18. Second class lever will always have a lever arm
- (a) Equal to 1
  - (b) More than 1
  - (c) Less than 1
  - (d) More than 2
19. Injury rate is higher in which of the following exercise training
- (a) Concentric
  - (b) Eccentric
  - (c) Plyometric
  - (d) All of the above.
20. Hyaline cartilage is found in
- (a) IVD
  - (b) Ears
  - (c) Epiglottis
  - (d) Joints.