REV-01
BPT/112/37/42

2025/12

SET C

BACHELOR OF PHYSIOTHERAPY
THIRD SEMESTER
BIOMECHANICS
BPT – 306

[USE OMR SHEET FOR OBJECTIVE PART]

Duration: 3 hrs. **Full Marks: 70**

Objective

Time: 30 min. **Marks: 20**

Choose the correct answer from the following: ***1×20=20***

1. Which type of grip is characterized by the use of the thumb and fingertips to hold small objects?
   a. Power grip
   b. Hook grip
   c. Pinch grip
   d. Cylindrical grip

2. The SI unit of power is
   a. Watt
   b. Joules
   c. Newton
   d. Ampere

3. Muscle involved in flexor mechanism of hand
   a. Palmar interossei
   b. Dorsal interossei
   c. Flexor digitorum superficialis
   d. Lumbricals

4. Which ions plays a major role in muscle contraction?
   a. Calcium
   b. Sodium
   c. Potassium
   d. Chloride

5. In wrist biomechanics, radial deviation occurs mostly at the:
   a. Radiocarpal joint
   b. Midcarpal joint
   c. Distal radioulnar joint
   d. Carpometacarpal joint

6. The SI unit of work is
   a. Newton
   b. Joule
   c. Watt
   d. None of the above

7. Which structure holds the head of the radius in place during movement at the proximal radio-ulnar joint?
   a. Quadrate ligament
   b. Annular ligament
   c. Interosseous membrane
   d. Oblique cord

8. Normal angle of inclination is
   a. 110-130 degrees
   b. 120 degrees
   c. 130-150 degrees
   d. 150-180 degrees

9. Which carpal bone is most important in wrist stability due to its bridging role?
   a. Lunate
   b. Capitate
   c. Scaphoid
   d. Hamate

10. Which connective tissue structure reduces friction between tendon/ligament and bone?
    a. Bursa
    b. Tendon
    c. Aponeuroses
    d. Cartilage

11. Which bone rotates during pronation and supination at the proximal radio-ulnar joint?
    a. Ulna around radius
    b. Radius around ulna
    c. Both rotate equally
    d. Neither bone rotates

12. The knee joint is an example of a
    a. Ball and socket joint
    b. Pivot joint
    c. Hinge joint
    d. Saddle joint

13. Which carrying angle of the elbow is formed between
    a. Long axis of humerus and ulna
    b. Long axis of humerus and radius
    c. Long axis of radius and ulna
    d. Long axis of capitulum and trochlea

14. The joint between vertebrae in the spine is a
    a. Cartilaginous joint
    b. Synovial joint
    c. Fibrous joint
    d. Ball and socket joint

15. Which structure serves as a roof for the carpal tunnel?
    a. Flexor retinaculum
    b. Palmaris longus tendon
    c. Extensor retinaculum
    d. Ulnar nerve

16. Normal angle of torsion for shoulder joint
    a. 30 degrees anterior
    b. 30 degrees medial
    c. 30 degrees lateral
    d. 30 degrees posterior

17. What is the carrying angle of the elbow, typically observed in the anatomical position?
    a. 0 degree
    b. 5- 15 degree
    c. 45 degree
    d. 20- 30 degree

18. Normal angle of inclination of femur:
    a. 110 degrees
    b. 130 degrees
    c. 90 degrees
    d. 125 degrees

19. Which of the following joints allows for pronation and supination of the forearm, affecting wrist movement?
    a. Distal radioulnar joint
    b. Radiocarpal joint
    c. Intercarpal joint
    d. Midcarpal joint

20. In second class lever load lies between
    a. Fulcrum and effort
    b. Resistance and fulcrum
    c. Between fulcrum
    d. None of the above

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Descriptive

Time: 2 hrs 30 min **Marks: 50**

[Answer question no.1 & any four (4) from the rest]

1. Describe the composition of fibrillar and interfibrillar components of extracellular matrix in connective tissue? **10**

2. Write in detail about angle of inclination. Explain coxa vera & coxa valga. **5+5=10**

3. Write in detail about kinetic and kinematics of humeroradial & humeroulna joint. Discuss about ligaments of proximal and distal radioulnar joint. **5+5=10**

4. Explain how immobilization and overuse injury affects muscle? **10**

5. Write in detail about kinetic and kinematics of wrist joint. **10**

6. Describe the load deformation curve with diagram? Describe the structure of a sarcomere with diagram? **5+5=10**

7. Write in detail about power grips & precesion handlings of hand complex. **10**

8. Describe the structure of a hip joint with diagram? Discuss the movements that occur in hip joint in relation to planes and axes? **5+5=10**

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