

Seat No. \_\_\_\_\_

Enrolment No. \_\_\_\_\_

**THE CHARUTAR VIDYA MANDAL (CVM) UNIVERSITY**

**BACHELOR OF PHYSIOTHERAPY – 3<sup>rd</sup> SEMESTER**

**APR-2026 EXAMINATION**

**Course Name: Biomechanics and kinesiology**

**Course Code: BPT-119**

**Total Printed Page: 03**

**Date: 13/04/2026**

**Time: 10:00 AM to 01:00 PM**

**Maximum Marks: 80**

**Instructions:**

1. There are total 4 Questions given in this paper.
2. All the answer should be written in the answer book.
3. Marks on the right side suggest the total marks of that question.
4. Draw the figure where necessary.

**Q.1 Multiple Choice Questions: (MCQs)**

**(15 × 1 = 15)**

1. Which knee joint ligament helps in locking?

- a) ACL
- b) PCL
- c) LCL
- d) Posterior capsule

2. Biceps brachii as an elbow flexors is most effective at \_\_\_\_\_ elbow flexion range.

- a) 45°
- b) 60°
- c) 90°
- d) 120°

3. In pulled elbow syndrome there is dislocation of \_\_\_\_\_.

- a) Radiohumeral joint
- b) Radioulnar joint
- c) Humeroulnar joint
- d) All of the above

4. Stance phase is \_\_\_\_\_ % of gait cycle.

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

5. \_\_\_\_\_ is basic contractile unit of muscle.

- a) Sarcolemma
- b) Sarcomere
- c) Myofibrils
- d) Myosin filaments

6. Rate of change of angular velocity is known as \_\_\_\_\_.

- a) Angular capacity
- b) Angular acceleration
- c) Angular length

d) Angular speed

7. Atypical vertebrae in cervical region are \_\_\_\_\_.

a) C<sub>1</sub>, C<sub>2</sub>

b) C<sub>2</sub>, C<sub>3</sub>

c) C<sub>5</sub>, C<sub>6</sub>

d) C<sub>7</sub>, T<sub>1</sub>

8. Which muscle is considered to be the key structure of dynamic stabilization?

a) Supraspinatus

b) Infraspinatus

c) Long head of biceps

d) Subscapularis

9. Normal carrying angle disappears when \_\_\_\_\_.

a) Elbow extension

b) Forearm pronation

c) Forearm supination

d) Shoulder flexion

10. Muscles which does primary action at wrist and secondary action at fingers \_\_\_\_\_.

a) Flexor carpi ulnaris

b) Flexor digitorum superficialis

c) Flexor digitorum profundus

d) Flexor pollicis longus

11. Anterior tilting of pelvis results in \_\_\_\_\_ movement at hip joint.

a) Hip extension

b) Hip abduction

c) Hip flexion

d) Hip internal rotation

12. Deltoid ligament of ankle complex is \_\_\_\_\_.

a) Lateral collateral ligament

b) Plantar calcaneonavicular ligament

c) Bifurcate ligament

d) Medial collateral ligament

13. Amount of time spent during a single step is called as \_\_\_\_\_.

a) Step duration

b) Cadence

c) Stride length

d) Step length

14. The most powerful muscle of the body is:

a) Quadriceps

b) Gluteus maximus

c) Gastrosoleus

d) Deltoid

15. The factors responsible for viscosity of synovial fluid is/are:

a) Chondroitin sulphate

b) Hyaluronic acid

c) Heparin sulphate

d) All of the above

**Q. 2. Short answers (5 out of 7) (Answer not exceeding 50 words) (5 × 2 = 10)**

- a. State the function of intervertebral discs also name any two muscles of the vertebral column.
- b. Define grip and what are the types of precision grip.
- c. Difference between Pes Planus & Pes Cavus.
- d. Enlist determinants of gait.
- e. What is the carrying angle?
- f. What is Trendelenburg gait?
- g. What are activities of daily living (ADL) also give 2 examples of ADL.

**Q. 3. Short Notes (5 out of 6) (Answer not exceeding 150 words) (5 × 5 = 25)**

- a. Difference between power and precision grip and explain in detail about power grip.
- b. Write about kinetics of vertebral column.
- c. Break down the phases of sit-to-stand and examine the role of joints and muscles.
- d. Explain scapulohumeral rhythm and discuss its clinical significance.
- e. Analyze biomechanics of hip joints during walking and standing.
- f. Describe in details about ligaments of elbow complex.

**Q. 4. Essay (3 out of 4) (3 × 10 = 30)**

- a. Describe gait and outline the phases of the gait cycle with associated joint movements and muscle activity.
- b. Analyze the role of rotator cuff muscle for shoulder dynamic stabilization.
- c. Explain the biomechanics of the knee joint and analyze how it contributes to stability during weight-bearing activities.
- d. Define posture and explain its types. Discuss the biomechanical basis of good posture and analyze the factors affecting it.