

21BP43

(Pages: 2)

Name:

Reg. No:

FOURTH YEAR B.P.Ed. (INTEGRATED) DEGREE EXAMINATIONS, APRIL 2025

(Regular/Supplementary/Improvement)

CC15U BPE4 T19 / CC19U BPE4 T19 – BIOMECHANICS

(2015 Admission onwards)

Time: Three Hours

Maximum: 75 Marks

I. Answer any *one* of the following:

1. State Newton's Laws of motion and explain its application in sports and games.

Or

2. Describe different types of levers and its advantages with suitable examples.

(1 × 15 = 15 Marks)

II. Write short notes on the following:

3. Principles of force application.
4. Importance of biomechanics.
5. Trajectory of a projectile.

(3 × 5 = 15 Marks)

III. Explain the following:

6. Support Phase in Walking.
7. Different types of spin.
8. Center of Gravity.

(3 × 5 = 15 Marks)

IV. Fill in the blanks:

9. When an object is in equilibrium, the sum of all forces acting on it is _____
10. _____ is a measure of the resistance of an object to rotational motion around an axis.
11. The _____ is the term used to describe the body's ability to effectively transfer momentum from the lower body to the striking limb during a strike.
12. In biomechanics, motion can be described as the change in _____ of an object over time.
13. The horizontal component of velocity of a projectile remains _____ throughout its flight.

(5 × 1 = 5 Marks)

V. State True or False:

14. Ground reaction forces during running are highest during the support phase.
15. In a second-class lever, the force arm is always longer than the resistance arm
16. If an object is in equilibrium, it must be motionless.
17. Buoyancy force depends on the volume of the object submerged in the fluid.
18. The biomechanical principle of stability states that a body is stable when its center of mass is located outside its base of support.

(5 × 1 = 5 Marks)

VI. Write answer in one word.

19. What is the acceleration of an object in free fall?
20. What is the primary purpose of arm swing during walking?
21. Is spin is a scalar or Vector quantity?
22. Type of path in projectile motion?
23. What is the principle that describes the resistance of an object to change its state of motion?
24. What generates spin?
25. What is the term for the motion of an object in a straight line with constant speed?
26. What opposes the horizontal motion of a projectile?
27. What is the primary force generation component in striking?
28. What arm describes the distance from the fulcrum to the point where the resistance is applied?

(10 × 1 = 10 Marks)

VII. Match the following:

- | | |
|-------------------------------|-------------------------|
| 29. Inertia | a. 9.8 m/s^2 |
| 30. Off centered force | b. Second Class Lever |
| 31. Flight time | c. First Law of Motion |
| 32. Speed Lever | d. Spin |
| 33. Standing on toes | e. Second Law of Motion |
| 34. $F = m a$ | f. Horizontal Velocity |
| 35. Force that opposes motion | g. Muscle |
| 36. Angle of pull | h. Third Class Lever |
| 37. Range of a Projectile | i. Friction |
| 38. Gravity | j. Height of Projection |

(10 × 1 = 10 Marks)
