

**17BP43**

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Name: .....

Reg. No: .....

**FOURTH YEAR B.P.Ed. (INTEGRATED) DEGREE EXAMINATIONS, APRIL 2021**

(Regular/Supplementary/Improvement)

**BPE4 T19 – BIOMECHANICS**

(2015 Admission onwards)

Time: Three Hours

Maximum: 75 Marks

I. Answer any *one* of the following:

1. Explain newton's laws of motion and application of the laws with regard to your game.

Or

2. Define lever and explain the types of lever with an example.

**(1 x 15 = 15 Marks)**

II. Write short notes on the following:

1. Biomechanics.
2. Factors influencing trajectory of projectile.
3. Types of equilibrium.

**(3 x 5 = 15 Marks)**

III. Describe the following:

1. Mechanical analysis of jumping.
2. Centre of gravity.
3. Types of spin.

**(3 x 5 = 15 Marks)**

IV. Fill in the blanks:

1. A push towards the center capable of equalizing the \_\_\_\_\_, the body is forced to rotate around the center axis.
2. The \_\_\_\_\_ arm is defined as the perpendicular from the axis of rotation to the line of action of the force.
3. All parts of the body which moves the same distance in the same direction and at the same time is called \_\_\_\_\_
4. "Giving with the force" or allowing one's body to move with the receiving or opposing surface or object is a principle of \_\_\_\_\_
5. \_\_\_\_\_ is created by applying a force that is off center to the object being thrown at the point of release.

**(5 x 1 = 5 Marks)**

V. State true or false:

1. In the third-class levers, the load is between the effort and the fulcrum.
2. A body is said to be in unstable equilibrium when it does regain its original position after being slightly pushed.

3. The position of center of gravity of a body remains unchanged even when the body is deformed.
4. Motion of a basketball into the basket is an example of curvilinear motion.
5. A centripetal force is a net force that acts along on an object to keep it moving along a circular path.

**(5 x 1 = 5 Marks)**

VI. Write answer in one word:

1. In which of class of lever is load in the center.
2. Name the principle that states that a body immersed in a fluid is subjected to an upwards force equal to the weight of the displaced fluid.
3. Name the type of spin, where the ball rotates forward as it is moving?
4. Name the angle formed between the line of pull of the muscle and the bone on which it inserts.
5. What is the optimum angle of release to achieve height in projectile?
6. What motion can be termed as the repeated motion in which an object repeats the same movement over and over?
7. Movement of objects along the circumference of a circle or rotation along a circular path is known as \_\_\_\_\_.
8. Name an athletic event where the centrifugal force is more applicable.
9. Name the hypothetical point around which the force of gravity appears to act.
10. The quantity which has both magnitude and direction is known as?

**(10 x 1 = 10 Marks)**

VII. Match the following:

- |                                   |                                |
|-----------------------------------|--------------------------------|
| 1. Extension during tennis stroke | a. Inertia                     |
| 2. Basketball free throw          | b. Projectile                  |
| 3. Pendulum                       | c. Defensive down in wrestling |
| 4. Newton's First Law             | d. Walking                     |
| 5. Buoyancy                       | e. Oscillatory Motion          |
| 6. Gait                           | f. Speed                       |
| 7. Stable Equilibrium             | g. Acceleration                |
| 8. Force                          | h. Back spin                   |
| 9. Newtons Second Law             | i. First class lever           |
| 10. Scalar Quantity               | j. Water polo                  |

**(10 x 1 = 10 Marks)**

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