2023

SPORTS BIOMECHANICS AND KINESIOLOGY

Paper : MPCC-202

Full Marks : 70

The figures in the margin indicate full marks.

Candidates are required to give their answers in their own words as far as practicable.

1. Define kinesiology and biomechanics. Discuss the role of sports biomechanics for improving sports performance. Explain the different planes and axes of the human body mentioning suitable movements. 4+5+6

Or,

Briefly explain the following terms with proper equations of the same : 5×3

(a) Force and Acceleration

(b) Work and Power

(c) Linear Velocity and Angular Velocity.

2. Why is Kinesiology important in physical education and sport? Write down the origin, insertion and action of three upper extremity muscles. 6+9

Or,

Explain prime movers muscles and antagonist muscles with example. Make a list of muscles that are involved in movements of the legs and mention origin and insertion of any three muscles from your list. 4+(5+6)

3. What is projectile motion? Classify projectile motion with examples from sports activities. Write down the equations of projectile motion for :

(i) Time of flight, (ii) Range, (iii) Maximum height reached. 2+7+6

Or,

What is biomechanical analysis? Make a list of the different instruments and equipment used in biomechanical research. Biomechanically analyze any one athletic event of your choice. 3+5+7

4. Write notes on ***any two*** : 7½×2

(a) Linear and angular kinetics

(b) Principles of body lever

(c) Aerodynamics

(d) Stability and its principles.

5. Answer the MCQs from below by choosing the correct option and writing the answer on your script (***any ten***) : 1×10

(a) The characteristics of any good starting position _____.

(i) Stable

(ii) Comfortable

(iii) Provide room for full range of motion

(iv) All of the above.

(b) Etymological meaning of Kinesiology is

(i) Science of motion of living being

(ii) Science of motion

(iii) Science of motion of human being

(iv) Science of motion of human being during sports participation.

(c) Coronal plane divides the body into

(i) Left and right halves (ii) Front and back halves

(iii) Upper and lower halves (iv) Inner and outer halves.

(d) Study of motion with zero acceleration is called

(i) Kinetics (ii) Statics

(iii) Kinematics (iv) Dynamics.

(e) In normal standing position the line of gravity passes _____ the knee joint.

(i) through (ii) laterally away from

(iii) behind (iv) in front of.

(f) Power and energy are

(i) Scalar quantities

(ii) Vector quantities

(iii) Power is scalar but energy is vector quantity

(iv) Power is vector but energy is scalar quantity.

(g) Elbow flexion is associated with

(i) Biceps muscle

(ii) Triceps muscle

(iii) Both biceps and triceps muscles

(iv) None of the above.

(h) Path of an object projected into vacuum is

(i) an ellipse (ii) a parabola

(iii) a circle (iv) a hyperbola.

(i) Resistance of an object to change in its state of motion is

(i) Velocity (ii) Acceleration

(iii) Inertia (iv) Momentum.

(j) A first class lever may act to

(i) Increase strength (ii) Maintain balance

(iii) Improve range of motion (iv) All of these.

(k) An athlete accelerates uniformly from rest to a speed of 5 m/s over a distance of 25m. What will be the acceleration of the athlete?

(i) $5\,m/s^2$ (ii) $0.5\,m/s^2$

(iii) $0.05\,m/s^2$ (iv) $0.0055\,m/s^2$.

(l) From what height will a ball take 5 seconds to reach the ground? ($g=9.8\,m/s^2$)

(i) 122.5m (ii) 12.25m

(iii) 1.225m (iv) None of these.