

2022

KINESIOLOGY AND BIOMECHANICS

Course Code: CC- 402

Full Marks : 70

The figures in the margin indicate full marks.

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

Answer *all* questions.

1. Explain the importance of Kinesiology in the field of Physical Education and sports. What is equilibrium? Write the role of Center of Gravity for maintaining equilibrium. 8+2+5

Or,

Define Axes and Planes. Briefly explain various types of planes of motion and axes of rotation with diagram. Write the important Scalar and Vector quantities commonly used in the field of sports biomechanics. 4+6+5

2. What is a joint? Classify joints and describe each type with example. Explain eccentric muscle contraction with example. 2+9+4

Or,

Write the concept of 'All or None Law' and 'Reciprocal innervations'. Write the name of the muscles present in hip joint and mention the movements permitted around this joint. 6+9

3. What is a projectile? Briefly describe various types of projectile motion. Write the factors influencing projectile motion. 2+9+4

Or,

Define Newton's first Law of motion and explains principles derived from this law for practical use with example. Briefly explain Axle and Pulley mechanisms. 2+7+6

4. Write short notes on following (*any two*) : 7½ × 2
- (a) Friction
 - (b) Angular kinematics parameters
 - (c) Inertia
 - (d) Stability.

Please Turn Over

5. Choose the correct option and write it on your answer script (*any ten*) :

1×10

- (a) Newton's 3rd Law of Motion is also known as :
- (i) Law of Acceleration
 - (ii) Law of Action and Reaction
 - (iii) Law of inertia
 - (iv) Law of Energy Conservation.
- (b) In which lever mechanical advantage may be equal to, less than or more than one ?
- (i) First class lever
 - (ii) Second class lever
 - (iii) Third class lever
 - (iv) None of the above.
- (c) Calculate displacement when an athlete runs first 30 m towards North and then 40 m towards West.
- (i) 70 m.
 - (ii) 50 m.
 - (iii) 30 m.
 - (iv) 40 m.
- (d) When every particle in a body moves through the same distance in the same direction, the motion is called :
- (i) Rotation
 - (ii) Translation
 - (iii) Acceleration
 - (iv) None of the above.
- (e) Joints that permit bending in only one plane are known as :
- (i) Condyloid
 - (ii) Hinge
 - (iii) Ball and Socket
 - (iv) All of the above.
- (f) Which of the following is an example of vector quantity?
- (i) Distance
 - (ii) Displacement
 - (iii) Speed
 - (iv) Energy.
- (g) A forward upward movement of the femur is known as :
- (i) Abduction
 - (ii) Flexion
 - (iii) Adduction
 - (iv) Extension.
- (h) One Radian is approximately equal to :
- (i) 360°
 - (ii) 57.3°
 - (iii) 47.3°
 - (iv) 67.3°
- (i) Example of Isometric muscle contraction is :
- (i) Hand's action in swimming
 - (ii) Pushing a wall with straight hands
 - (iii) Arm curl with barbell
 - (iv) All the above.
- (j) Unit of linear deceleration is :
- (i) m/s
 - (ii) m^2/s^2
 - (iii) m/s^2
 - (iv) m^2/s

(k) If the height of the position of the Centre of Gravity increases, the stability of the body :

(i) will be unaffected

(ii) will increase

(iii) will decrease

(iv) may either increase or decrease.

(l) Product of Mass and Velocity is :

(i) Momentum

(ii) Impulse

(iii) Inertia

(iv) Kinetic Energy.
