

2021

KINESIOLOGY AND BIOMECHANICS

Paper : CC-402

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.*

Answer **all** the questions.

1. (a) What do you mean by kinesiology and biomechanics? Write down the importance of Sports Biomechanics in enhancing sports performance. Explain the role of centre of gravity and line of gravity in performing movement and maintaining stability. 4+5+6
- Or,**
- (b) What do you mean by Sports Biomechanics? What are the various terminologies of fundamental human movement? Define equilibrium, balance and stability. 2+7+6
2. (a) What is muscle contraction? Briefly discuss various types of muscle contraction. Write down the name of muscles involved and possible movements of knee or elbow joint. 2+6+7
- Or,**
- (b) What is muscle? Classify muscle with examples. Write down the name of the muscles constitute the quadriceps and hamstring. 2+6+7
3. (a) What are levers and body levers? Explain the actions of various types of lever with suitable examples. What do you mean by mechanical advantage? 4+9+2
- Or,**
- (b) Define motion. Explain various types of motion with suitable examples from sports field. Explain the relation: Force = Mass × Acceleration. 2+10+3
4. Write short notes on (**any two**) : 7½×2
- (a) Linear Kinematic Parameters
- (b) Projectile Motion
- (c) Force and Couple
- (d) Angular Momentum and Moment of Inertia.
5. Choose the correct option and write it on your answer script (**any ten**) : 1×10
- (a) Mechanics is a branch of
- (i) Kinesiology (ii) Biology
- (iii) Physics (iv) Biomechanics.

Please Turn Over

- (b) Sartorius muscle is situated at :
- (i) Thigh
 - (ii) Arms
 - (iii) Lower leg
 - (iv) Hip.
- (c) Newton's 2nd law of motion is also known as :
- (i) Law of action and reaction
 - (ii) Law of conservation of energy
 - (iii) Law of inertia
 - (iv) Law of Acceleration.
- (d) In human body the joint between sternum and ribs is :
- (i) Gliding
 - (ii) Fibrous
 - (iii) Cartilaginous
 - (iv) Synovial.
- (e) A muscle which flexes both hip and knee joint is :
- (i) Sartorius
 - (ii) Biceps femoris
 - (iii) Rectus Femoris
 - (iv) Gluteus maximus.
- (f) Power is :
- (i) rate of doing work
 - (ii) ability to do work
 - (iii) force per unit area
 - (iv) rate of increase of momentum.
- (g) One Newton of force, acting on a mass of 1 gm would produce an acceleration of :
- (i) 1 ms^{-2}
 - (ii) 1 cm s^{-2}
 - (iii) 10^5 m s^{-2}
 - (iv) 10^5 m s^{-2} .
- (h) Mechanical advantage is always less than one in :
- (i) 1st class lever
 - (ii) 2nd class lever
 - (iii) 3rd class lever
 - (iv) None of these.
- (i) On a plane surface, the range of a projectile is maximum when the angle of projection is :
- (i) an acute angle
 - (ii) exactly 45°
 - (iii) between 45° and 90°
 - (iv) exactly 90° .
- (j) Side bending is an example of movement in the –
- (i) Transverse plane
 - (ii) Frontal plane
 - (iii) Sagittal plane
 - (iv) Horizontal plane.
- (k) An athlete takes 6 seconds to cover a distance of 40m. The average speed is :
- (i) 24 km/hr
 - (ii) 2.4 km/hr
 - (iii) 4 km/hr
 - (iv) 40 km/hr.
- (l) What is the magnitude of momentum of a cricket ball of mass 120g moving at 15ms^{-1} ?
- (i) 18 Ns
 - (ii) 1.8 Ns
 - (iii) 1800 Ns
 - (iv) 180 Ns.
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