2021

SPORTS BIOMECHANICS AND KINESIOLOGY

MPCC- 202

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 the questions

1. Define Kinesiology. Discuss the scope of Sports Biomechanics. Write the historical development of Kinesiology in brief. 3+6+6

Or

Explain the following terms:
(i) Centre of Gravity
(ii) Equilibrium
(iii) Vector and scalar quantities 5+5+5

2. Discuss the role of muscles in physical works and sports performance. Name the muscles that are involved in the movements of elbow joints and mention their origin, insertion and action. 5+5+5

Or

What is the role of muscles for performing daily activities or exercises? Which muscles are involved in the movements of the knee joint? Write the origin, insertion and action of those muscles. 5+5+5

3. What is Projectile Motion? What are the factors influencing the motion of a projectile? Discuss the principles of projectile motion. 2+5+8

Or

Define Force and write its c.g.s. and S.I units. Enlist the different types of force with examples. Discuss the effects of force on objects. 4+5+6

4. **Write notes on (any two):** 2x7.5
    (a) Methods of Movement analysis
    (b) Magnus effect and spin
    (c) Frictional force and sports
    (d) Levers and their mechanical advantage.

5. **Answer the MCQs from below by choosing the correct option and writing the answer on your script (any ten):** 10x1

    (a) *The Special Kinesiology of Educational Gymnastics*- the first book ever written in the world with the word "Kinesiology" was written by:
    (i)   Pehr Henrik Ling
    (ii)   Nils Posse
    (iii) James Buchanon
    (iv)   J. F. William.

    (b) A kinematic parameter which is a vector quantity and describes the length of the shortest distance from the initial to the final position of a moving object is:
    (i)   Distance
    (ii)   Displacement
    (iii) Velocity
    (iv)   Speed.

    (c) Which of the following quantities related to angular motion is equivalent to force in linear motion?
    (i)   Angular Acceleration
    (ii)   Angular Velocity
    (iii) Angle of rotation
    (iv)   Torque

    (d) Which of the following factors affect the stability of an object?
    (i)   Width of base of support
    (ii)   Line of gravity
    (iii) Weight of the object
    (iv)   All the above

    (e) The SI unit of Power (the rate at which work is done) is:
    (i) Watt
    (ii) Joule
    (iii) Newton
    (iv) Dyne.

Please Turn Over

(f) The muscle that originates from the anterior border and upper surface of the lateral third of the clavicle acromion, spine of the scapula and insert with deltoid tuberosity of humerus, taking part in the movements of shoulder abduction, flexion and extension is :

    (i)   Pectoralis major muscle

    (ii)   Deltoid muscle

    (iii)   Serratus anterior muscle

    (iv)   Trapezius muscle.

(g) Which of the following muscles constitute the Hamstring group of muscles?

A. Rectus femoris B. Biceps femoris C. Semitendinosus D. Vastus lateralis E. Semimembranosus

    (i) A-B-C

    (ii) B-C-E

    (iii) C-D-E

    (iv) D-E-A

(h) During the course of a 100 m sprint, an athlete gained 10.50m/s velocity at the distance of 30m. If the athlete maintained this velocity for next 4.5 seconds, then how much distance can she cover during the 4.5 s?

    (i)   30.50 m

    (ii)   40.50 m

    (iii)   47.25 m

    (iv)   58.47 m

(i) If a sprinter starts 100m sprint with an acceleration of 4.5 m/s^2, what will be the velocity of the sprinter after 5 sec?

    (i)   10.5 m/s

    (ii)   22.5 m/s

    (iii)   45.5 m/s

    (iv)   50.5 m/s

(j) The fulcrum is in between the points of application of the force and the load in:

    (i)   Class one lever

    (ii)   Class two lever

    (iii)   Class three lever

    (iv)   None of these

Please Turn Over

(k) The path followed by a projectile from release to land is called:
- (i)   Orbit
- (ii) Trajectory
- (iii) Range
- (iv) Track

(l) Which of the following statements is false when a ball is moving in the air with top-spin?
- (i)   High pressure forms above and low pressure forms below the ball
- (ii) Magnus force acts downwards
- (iii) Velocity of ball decreases after impact with the ground
- (iv) The ball rebounds at a lower angle with ground than the angle at incidence.

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