Avinashilingam Institute for Home Science and Higher Education for Women

Deemed to be University Estd. u/s 3 of UGC Act 1956, Category A by MHRD (now MoE)
Re-accredited with A++ Grade by NAAC. CGPA 3.65/4, Category I by UGC
Coimbatore - 641 043, Tamil Nadu, India

Bachelor's Degree Arrear Examination – April 2026
V Semester

Batch : 2023 **Time : 3 Hours**
Major : Physical Education **Max. Marks : 100**

23BPEC17 Kinesiology and Biomechanics

Course Outcomes:

CO1: Understand the Skeletal structure of human body by identifying the origin and insertion of various muscles .
CO2: Orient the students in basic structure and functions of primary joints of the body
CO3: Relate and interpret the role of various mechanical principles in human movements .
CO4: Know the effectiveness of human movement using mechanical principles .
CO5: Develop physical conditioning programs based on scientific principles designed to develop physical fitness and improve athletic performance .

Part A

Circle the correct answer **10 X 1 = 10**

1. Which type of lever system is most common in the human body, such as the biceps acting on the elbow joint? CO3K2
   a) First-class lever b) Fourth-class lever
   c) Third-class lever d) Second-class lever

2. Which muscle of the rotator cuff is primarily responsible for the first 15 degrees of shoulder abduction? CO1K3
   a) Infraspinatus b) Subscapularis
   c) Supraspinatus d) Teres minor

3. The 'Brachialis' muscle is often called the 'workhorse' of the elbow. Why is this biomechanically true? CO4K2
   a) It is the only muscle that can supinate the forearm
   b) Its insertion on the ulna means its effectiveness is unaffected by forearm rotation
   c) It has the longest moment arm of all elbow flexors
   d) It is a multi-joint muscle crossing the shoulder and elbow

4. What is the biomechanical term for the 'rotary' effect of a force around a joint axis? CO4K2
   a) Friction b) Torque
   c) Velocity d) Inertia

5. In biomechanics, what happens to the force required by a muscle as its 'moment arm' increases? CO2K1
   a) The force required decreases b) The muscle stops functioning
   c) The force required increases d) The force required remains constant

6. When a weightlifter holds a barbell stationary above their head, which kinetic variable is present despite a lack of movement? CO3K4
   a) Velocity b) Acceleration
   c) Displacement d) Static Force (Compression)

7. When describing the "path of a projectile" (like a shotput) through the air without mentioning the force of the throw, you are performing : CO2K1
   a) Kinetic analysis b) Kinematic analysis
   c) Qualitative kinetics d) Static equilibrium

8. Which of the following describes the 'Center of Pressure' (CoP) during a normal stance phase? CO2K2
   a) It moves laterally toward the small toe during toe-off
   b) It remains stationary at the heel
   c) It moves from the heel, through the midfoot, to the forefoot
   d) It is always located at the body's center of gravity

9. According to Newton's First Law, what happens to an object in motion if no external net force acts upon it? CO3K1
   a) It will change its direction of travel
   b) It will continue moving at a constant velocity
   c) It will accelerate in the direction of its current motion
   d) It will gradually slow down and stop

10. Why does a feather fall slower than a hammer on Earth, but at the same rate on the Moon? CO4K1
    a) The Moon has no atmosphere (air) to provide resistance
    b) Gravity is stronger on the Moon
    c) The feather is lighter on the Moon
    d) Hammers are more aerodynamic than feathers.

Part B

Answer all questions

Each answer should not exceed 400 words or two pages **5 X 6 = 30**

11.a. Define kinesiology & Biomechanics.	CO1K1
(or)	
11.b. Brief the types of Joints.	CO2K2
12.a. Draw the Carpal bones.	CO3K3
(or)	
12.b. Draw the Tarsal bones.	CO3K3
13.a. Define Planes and write the types.	CO4K4
(or)	
13.b. Differentiate Kinetics and Kinematics.	CO5K5
14.a. Brief - Newton's Laws of Motion.	CO3K3
(or)	
14.b. Define centre of gravity.	CO4K4
15.a. Brief - a)Buoyancy force b)fluid resistance.	CO5K5
(or)	
15.b. Brief - a)Air Gravity b)Water Friction.	CO4K2

Part C

Answer all questions

Each answer should not exceed 800 words or four pages **5 X 12 = 60**

16.a. Enumerate the need & importance of Kinesiology.	CO2K2
(or)	
16. b. List any 10 muscles with its muscular grouping designing and Kinesiological grouping.	CO3K3
17.a. Draw the bones of the Lower Limbs.	CO4K4
(or)	
17. b. Draw the bones of the Limbs.	CO5K5
18.a. Explain the Origin,Insertion & action of Deltoid muscle and Trapezium muscle.	CO4K5
(or)	
18.b. Elaborate - Equilibrium and its types.	CO2K4
19.a. Explain the types of motion with appropriate sports examples.	CO2K1
(or)	
19.b. Describe the application of bio mechanical principles in throwing events.	CO4K4
20.a. Explain the Origin, Insertion & action of Quadriceps muscle and Plantaris muscle.	CO5K6
(or)	
20.b. Describe Gait Analysis and explain its uses in the field of Physical Education and Sports.	CO5K4

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