**Basic Concepts of Biomechanics**

* **Define Newton’s Laws of Motion;**
* **Describe the types of motion produced (linear, angular or general);**
* **Describe the effect of size of force, direction of the force and the position of application of force on a body;**
* **Define centre of mass;**
* **Explain the effect of changes in the position of the centre of mass and the area of support when applied to practical techniques;**
* **Carry out a practical analysis of typical physical actions**

**Section 1 - Force**

* **Describe the effect of size of force, direction of the force and the position of application of force on a body;**

1. **When hitting a ball in tennis an understanding of force is important. Explain how force can cause the ball to: (i) Move straight (ii) Spin (iii) Use a practical example to describe how angular motion is produced. (3 marks)**

**Section 2 – Newton’s Laws**

* **Define Newton’s Laws of Motion;**

1. **Using Newton’s Laws of Motion, explain the effects of force acting on a projectile just prior to flight. Other than the size of the applied force, identify and explain additional factors that can affect the horizontal distance achieved by a projectile. [5 marks]**
2. **Fosbury Flop. Using Newton’s Laws of Motion, explain the significance of the vertical forces. [5 marks]**

**Section 3 – Types of Motion**

* **Describe the types of motion produced (linear, angular or general);**

1. **Explain how a footballer would apply force to a ball in order to create spin and name the type of motion which this would create. Using a practical example from Physical Education or sport describe linear motion. (5 marks)**

**Section 4 – Centre of Mass & Stability**

* **Define centre of mass;**
* **Explain the effect of changes in the position of the centre of mass and the area of support when applied to practical techniques;**

1. **Using an example from PE or Sport explain how changes in the position of a performer's centre of mass can affect performance. (5 marks)**
2. **Most positions and techniques in sport require a large range of movement around a joint. List the balances in order of stability and identify the principles that make a body stable. Use examples from sports of your choice, explain occasions when a performer needs to be stable and when they need to be unstable. (8 marks)**