CBSE Test Paper 01

CH- 10 Biomechanics and Sports

1. Which type of sports injury is known as **Strain**?
2. What do you mean by a plane?
3. What do you mean by circumduction?
4. What do you mean by axes?
5. What is energy?
6. Explain the law of inertia?
7. **Friction is a necessary evil**. Justify your answer with suitable examples from sport.
8. What do you mean by plane? Explain its types.
9. What do you mean by plane? Discuss the types of plane.
10. What are the major muscles that we use while we run?

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Answer

1. It is a soft tissue injury.
2. Plane is an imaginary, flat surface passing through the body organ or plane is the surface on which the movement occurs.
3. Circumduction is that movement which takes place between the head of a bone and its articular cavity. This kind of motion is best seen in the shoulder and hip joints.
4. An axis is a straight line around which an object rotates.
5. Energy can be defined as the capacity or ability of the body to do work. Work is always done at the expense of energy is spent when a force does work on an object. The SI unit of energy is joule and in and in cgs system erg.
6. According to this law a body at rest will remain at rest and a body in motion will remain in motion at the same speed and in the same direction unless acted upon by an external force. There are great examples of this law in sports such as starting in rowing, starting in sprinting, starting in throwing the hammer. Basically, if an object is in motion, it remains in motion unless something or some external force stops it. The external force may be gravitational force, the surface of playing field or a defensive player etc.
7. Friction is usually called a necessary evil. It means that it is essential in games and sports. Without friction, we cannot give a better performance in the field of sports. Examples are spikes used by athletes for running and studs used in football boots of the players. However, friction has disadvantages also. In cycling, there should not be more friction between road and the tyres of the cycle.
8. Plane is an imaginary, flat surface passing through the body organ or plane is the surface on which the movement occurs. There are following types of planes:
    1. Sagittal or Medial plane: The sagittal plane is a vertical plane passing from the rear to the front, dividing the body into left and right halves. It is also known as anterior posterior plane. Most of the sports and exercise movements that are two dimensional, such as running, long jumping and somersault take place in this plane.

2. Frontal or Coronal plane: the frontal plane is also vertical and passes from left to right dividing the body into posterior to anterior halves. It is also known as coronal plane. Frontal plane cuts the body into front and back. Movements along the frontal plane can include cartwheel and star jumps.
3. Transverse or Horizontal plane: The transverse plane divides the body into top and bottom halves. In fact, it divides the body into upper and lower sections. This plane lies horizontally that why it is also called horizontal plane. Movements along this plane can include an ice- skating spin or rotation to play a tennis shot.

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10. The main running muscles include the quadriceps, hamstrings, glutes, hip flexors and calf muscles. With that in mind, your body also relies on secondary, or assistant, muscles to keep you going forward. The main muscles that are working the most when you run are your quads, hip flexors, hamstrings, glutes and calf muscles. Following are the four muscles that we use while we run.
    i. **Quads (Quadriceps Femoris)** Quads are muscle groups of four basic muscles located on our front thighs. They are
        - The rectus femoris
        - The vastus lateralis

- The vastus medialis
- The vastus intermedium.

  Our quads are responsible for moving two of the joints used in running, our knee joint and our hip joint. They work together to straighten our knees and bend our hips.

ii. **Quads (Quadriceps Femoris)** Our hamstrings are made up of four muscle-parts on the back of your thighs. These are known as
   - The semitendinosus
   - The semimembranosus
   - The biceps femoris

     (two parts long head and short head).

     These four parts of our hamstrings allow us to flex our knees The semitendinosus, semimembranosus and the long head biceps femoris work together to extend the hips.

iii. **Hip Flexors (Iliopsoas)** Our hip flexors (or iliopsoas), like our quads, is comprised of a muscle group of two muscles
   - The iliacus
   - The psoas major

     To our right, the shortest muscle, the iliacus, begins on our pelvic crest (the iliac fossa) and stretches over to our thigh bone (femur). The larger of the muscles, the psoas major, stretches from our T-12 spinal vertebrae to our L-5 spinal vertebrae and there attaches to the femur These two muscles work together to help our hips flex.

iv. **Calf Muscles** Our calf muscles are located on the back of our leg, below our knee. Though many anatomists see the calf muscle to be a single muscle (triceps surae). most say that. It is a muscle group, like our quads and hip flexors.

   This group consists of two main muscles,
   - The gastrocnemius·
   - The soleus

     Our calf muscles will allow us to flex our knee and plantar flex our ankle Like our quads. our calf muscles can be strengthened by doing squats. Other good strength-building exercises would include calf muscle raises and skipping.