CBSE Test Paper 03

CH- 10 Biomechanics and Sports

1. What is frontal plane?
2. What is lift?
3. What are gliding movements?
4. An object thrown into the space either horizontally or at an acute angle under the action of gravity is called a projectile. Name the two forces which act on a projectile.
5. What are core muscles?
6. Explain the strategies for enhancing adherence to exercise.
7. Enlist the major muscles involved in running and explain any one.
8. What do you mean by axis? Discuss various types of axes.
9. Discuss the various types of movements in detail.
10. Which muscles are used in jumping?

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Answer

1. 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.
2. Lift: lift is the force that pushes the object to move upward. It is the force that is the opposite of weight
3. Gliding movements is the simplest kind of movement that can take place in a joint, one surface gliding or moving over another without any angular or rotator movement.
4. The two forces that act on a projectile are amount of force driving it upward and Center of gravity
5. Core muscles: Strong abs and back are really important because they keep your posture upright and overall form good. These muscles play a significant role in running.
6. i. Simple exercise in the beginning.
   ii. Exercise in the morning.
   iii. Concentrate only on yourself.
7. The major muscles involved in running are described below:
   a. Glutes
   b. Quads
   c. Calves
   d. Hamstrings
   e. Core muscles
   f. Biceps: biceps also play a vital role in running. Biceps maintain a bent arm and help in swinging your arms back and forth while running.
8. An axis is a straight line around which an object rotates. Movements at the joints of human musculoskeletal system are mainly rotational and take place about a line perpendicular to the plane in which they occur. This line is known as axis of rotation.

There are following types of axes of rotation:

a. Sagittal axis: The sagittal axis passes horizontally from posterior to anterior. It is formed by the intersection of the sagittal and transverse plane. Sagittal axis passes from front to back.
b. Frontal axis: The frontal axis passes horizontally from left to right. It is formed by the intersection of frontal and horizontal plane. Frontal axis passes from side to side.
c. Vertical axis: The vertical axis passes vertically from inferior to superior. It passes straight through the top of the head down between feet. It is formed by the intersection of sagittal and frontal plane. It is also known as longitudinal axis. It is the longest axis.

9. There are various types of movement in body parts which can be divided in four types i.e. gliding & angular movements, circumduction & rotation and few other movements.

Gliding movements: Gliding movements is the simplest kind of movement that can take place in a joint, one surface gliding or moving over another without any angular or rotator movement.

Angular movement: Angular movement occurs between long bones. By angular movement the angle between the two bones increased or decreased. The various movements which fall under angular movements are described below:

a. **Flexion:** Bending parts at a joint so that the angle between them decreases and parts come closer together (bending the lower limb at the knee).
b. **Extensions:** Straightening parts so that the angle between them increases and parts moves farther apart (straightening the lower limb at the knee).
c. **Abduction** means moving a part away from the midline (lifting the upper limb horizontally to form a right angle with the side of the body))
d. **Adduction** means moving a part towards the midline (returning the upper limb from the horizontal position to the side of the body).
e. **Circumduction**: 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.

Rotation: Rotation is a form of movement in which a bone moves around a central axis without undergoing any displacement from the axis. Moving a part around an

axis is called rotation.eg. Twisting the head from side to side.

10. Following muscles are used in jumping
    i. **Quadriceps** The quadriceps rest on the front of the thighs and they have four components: the vastus medialis, vastus lateralis, rectus femoris and vastus iterrmedius During a jump. you perform hip flexion and knee extension, which both activate the quadriceps Hip flexion takes place when you move your thigh toward your stomach, knee extension takes place when you straighten your leg. A squat is a specific exercise that can help you gain more strength in the quads.
    ii. **Hamstrings** The hamstrings are opposing muscles to the quadriceps and have an opposite function. You activate your hamstrings through hip extension and knee flexion. Hip extension takes place when you bend your knee and move your heel toward your butt Hip extension also causes you to work the glutes. From an anatomical standpoint, the hamstrings have three parts the biceps, femoris, semimembranosus. All parts get activated during the lowering phase and the explosive phase of a jump A squat works the hamstrings. but you can place more emphasis on them by doing a lunge.
    iii. **Hip Flexors** The hip flexors run from the lower stomach to the top of the thighs. They consist of the psoas major and iliacus, and because of this, they are often referred to as the iliopsoas. As the name implies. these muscles get activated when you flex your hip, in a similar fashion to the quads Although these muscles are small, they are important for explosive motions like sprinting a jumping. A lying leg raise is a good exercise to strengthen the hip flexors.
    iv. **Calves** The calve-, have two part; the gastrocnemius and soleus. The gastrocnemius has a lateral heading medial head and it is easily seen on the back of the leg right below the knee The soleus sits anterior, or in front of the gastrocnemius. Both parts function to plantar-flex the foot. This motion occurs when you jump off the ground and point your toes downward.
    Jumping rope is a good cardiovascular exercise to train these muscles because of the repetitive hopping you do on your toes. A tuck jump is a good exercise to work your calves because it is specific to jumping.