



## 9. Locomotion

### Technical Words:

Femur	- The thigh bone which is the longest bone in the body
Joint	- The place where bones meet
Ligament	- Tough tissue that connects two bones
tendon	- Tough tissue that connects a bone to a muscle

### A. Very short answer question.

#### 1. Which part of the skeleton does not protect any major organ?

[Answer] The part of the skeleton that does not protect any major organ is the patella (knee cap).

#### 2. The only bone in the skull that can be moved is the lower jawbone. How does this movement help humans?

[Answer] The only bone in the skull that can be moved is the lower jawbone. This movement helps humans in actions like speaking and chewing.

#### 3. How does the ability of the ribs to move help us?

[Answer] The ability of the ribs to move helps us in breathing. When the ribs move up and out (during inhalation), they create space for the lungs to fill with air; and when the ribs move down and in (during exhalation), air is expelled from the lungs.

#### 4. What is the name of the bone that forms the knee cap?

[Answer] The bone that forms the knee cap is called the patella.

#### 5. Which organs does the pelvic girdle protect?

[Answer] The pelvic girdle protects the reproductive organs, urinary bladder, and parts of the digestive system.

### B. Short answer question.

#### 1. Differentiate between movement and locomotion.

[Answer] Movement means any change in the position of body parts, while locomotion means the ability to move the entire body from one place to another.

**2. Differentiate between true ribs and false ribs.**

[Answer] The first seven pairs of ribs are attached directly to the sternum. These are true ribs. The eighth, ninth and tenth pairs of ribs are attached to the lowest true rib (7th). These are known as false ribs.

**3. Differentiate between ball-and-socket joints and hinge joints.**

[Answer] Ball-and-socket joints allow movement in all directions. For example, the shoulder joint. In the shoulder joint, the ballshaped head of the humerus fits into a cup-shaped cavity or socket in the shoulder girdle. The arm can therefore move freely in all directions.

Hinge joints allow movement in one plane. The bones of the forearm move like door hinges at the elbow joint. Movement in this type of joint is restricted to one direction only. Each bone in a hinge joint functions like one half of a hinge.

**4. Describe how an earthworm moves.**

[Answer] An earthworm moves by contracting and relaxing its muscles. This causes its body to shorten and lengthen. It uses its setae to grip the ground and push itself forward by regular contractions and expansions of the muscles.

**5. Describe how snails move.**

[Answer] Snails move by rhythmic contractions of their foot, which is a muscular organ on the underside of their body. They secrete slimy mucus which helps them to glide along the surface, using a wave-like motion of their foot.

**C. Long answer question.**

**1. Describe the structure of the human skeletal system.**

[Answer] The skeletal system is the internal framework of the body. The human skeleton is made of bones and cartilage. The bones of the human skeleton can be grouped into bones of the skull, the vertebral column, the ribcage, the limbs and the shoulder and pelvic girdles.

- **Bones:** The skeletal system consists of over 200 bones when we are born, but as we grow, some of these bones fuse together. In an adult human, there are typically 206 bones. Bones are hard and strong. They are made of bone cells, protein and minerals such as calcium.

- **Cartilage:** Cartilage is a kind of tissue that is found at the ends of bones (in the joints) and between the vertebrae in the spine. It also forms part of the nose and the pinna of the ear. Cartilage is softer than bone and can bend. The cartilage found in the joints helps to cushion the movement between the bones. If there were no cartilage between bones, any movement will wear away the bones and lead to pain and discomfort.

- **Ligaments:** Ligaments are strong bands of tissue that connect bones to other bones. They help hold the joints together

- **Tendons:** Muscles are connected to bones by tendons. They help in the combined movement of bones and muscles.

**2. Briefly explain the functions of the skeletal system with examples.**

[Answer] The skeletal system is made up of bones and has the following important functions in our body.

- **Support:** The skeletal system provides a framework for our body. It gives shape and support to our body. For example, the spine supports our back, allowing us to stand and walk.
- **Protection:** Bones protect our internal organs. For example, the skull protects our brain, and the ribcage protects our heart and lungs.
- **Movement:** Bones work with muscles to allow us to move. When we bend our arm at the elbow, our bones and muscles work together.
- **Production of blood cells:** Inside some bones, there is a soft substance called the bone marrow. Blood cells are made in the marrow.

**3. What are joints? Describe any one kind of joint found in the human body.**

[Answer] Joints are places in our body where two or more bones meet. An example of a joint in our body is a 'hinge joint'. A hinge joint allows movement in only one direction, like the hinge in a door. The movement is up and down, or forward and backward. Hinge joints are found in the elbow and knee. These joints allow us to bend and straighten the limbs, but no other direction of movement is possible.

**4. Explain how muscles and bones work together to allow movement.**

[Answer] Bones cannot move by themselves. They have to work with the muscles to make movements and locomotion possible. Muscles help the body move by pulling on bones. Muscles are attached to bones through tendons, which are tough bands of tissue.

A muscle becomes shorter when it contracts and comes back to its normal size when it relaxes. All muscles work in pairs to move a bone—one contracts and the other relaxes.

There are two muscles—the biceps and the triceps—that are involved in bending and straightening the arm. They work together as a pair. For example, when you bend your arm, the biceps muscle contracts and bulges. It pulls the bones of the lower arm, bringing them close to the shoulder. As a result, the arm bends at the elbow. When you straighten your arm, the triceps muscle contracts and pulls the forearm to the original position.

**5. How does a streamlined body help animals in locomotion?**

[Answer] A streamlined body shape helps animals like fish and birds in locomotion by decreasing the resistance, which makes it easier for them to swim or fly. Fish have a streamlined body shape that is narrower in the front and broad towards the tail. This shape helps them minimise resistance as they move through water. Water flows smoothly over their bodies, reducing friction, so they can swim faster.

Birds have streamlined bodies with a pointed beak at the front and tapered wings. This shape is like an airplane wing and reduces air resistance when they fly. The streamlined body of birds allows them to cut through the air easily.

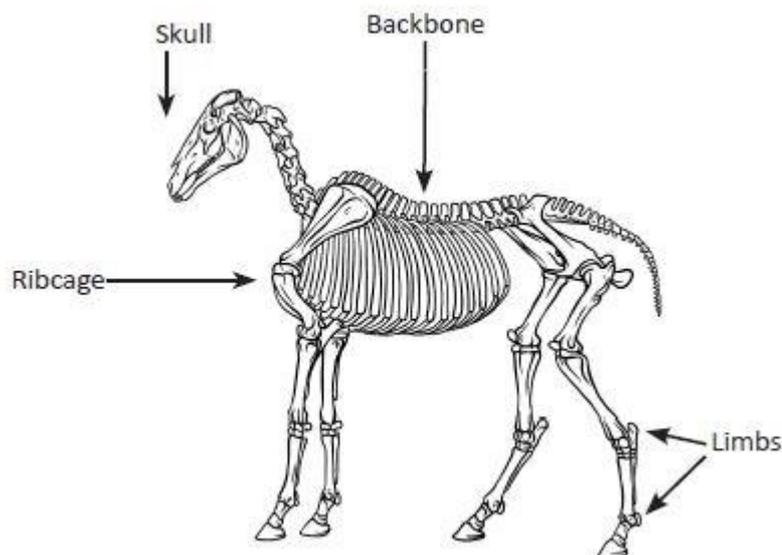
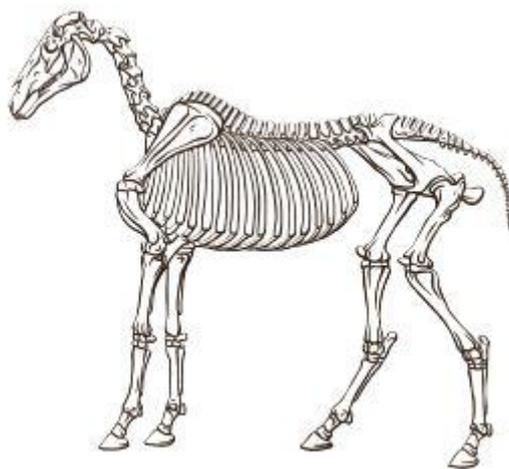
**6. Briefly describe the bodies of snakes and birds, and explain how they move.**

[Answer] Snakes have a flexible backbone that allows their bodies to curve as needed. They do not have limbs. Snakes also have scales on the body that help them grip the surface during movement. They move by forming a series of S-shaped curves and pushing against the surface, thus moving the body forward. Birds have a streamlined body which helps them cut through the air while flying. Birds also have a pair of wings that have feathers. They move by flapping their wings up and down. The type of feathers found on the wings and the tail feathers help the birds change direction and height during flight. As their bones are hollow and filled with air, their skeleton is light and makes flying easy. They have powerful chest muscles for flying. They can also walk and run using their legs.

**D. Image-based question.**

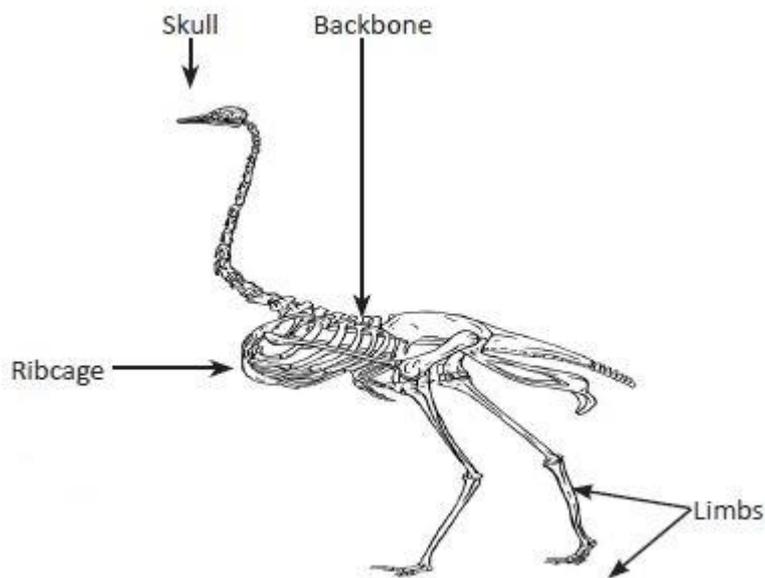
**Identify the skull, ribcage, backbone and limbs of the vertebrate skeleton.**

1.



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2.



1. **Assertion** : The up and down movements of four arms are controlled by two types of muscles, biceps and triceps.

**Reason** : Biceps : Biceps are the muscles that straighten the arm and triceps are the muscles that bend the arm.

**Ans - c - A is true but R is false.**

2. **Assertion (A)** - Snails move with the help of muscular foot.

**Reason (R)** - The outer skeleton of a snail is called the shell.

**Ans - b - Both A and R are true but R is not the correct explanation of A.**