SKELETAL AND MUSCULAR SYSTEM (KEY)
Introduction

TEACHING TASK

Multiple Choice Questions

1. c) Calcium, proteins, vitamins, and minerals.
This composition gives bones their strength and rigidity.

2. b) 300 bones.
However, as we grow, some of these bones fuse together, resulting in a total of 206 bones in adulthood.

3. d) Cartilage
helps bones to grow and repair themselves. It acts as a cushion at joints and also plays a crucial role in the development and growth of long bones, particularly during childhood and adolescence.

4. c) internal organs like the heart, lungs, and brain.
They form a protective structure around these vital organs, shielding them from injury.

5. a) decreases.
We are born with around 300 bones, but as we age, some of these bones fuse together, resulting in a total of 206 bones in adulthood.

SKELETAL AND MUSCULAR SYSTEM (KEY)
Skeletal System

TEACHING TASK

CONCEPTUAL UNDERSTANDING QUESTIONS (CUQ's)

Multiple Choice Questions

1. C) Upper part
(also known as the cranial part of the skull). The cranial bones protect the brain and include the frontal, parietal, temporal, occipital, sphenoid, and ethmoid bones.

2. B) To protect the brain.
The skull forms a protective encasement around the brain, shielding it from injury.

3. B) Flexible muscles.
These muscles enable the jaw to open and close, allowing for movements necessary for chewing and speaking. The hinge joint also plays a role in this mobility.

4. D) To promote flexibility.
These cartilage discs, known as intervertebral discs, allow for movement between the vertebrae and help absorb shock, contributing to the overall flexibility of the spine.

5. B) spinal
cord passes through the hole in each vertebra. This hole is called the vertebral foramen, and it forms the spinal canal, which houses and protects the spinal cord.

6. C) Floating ribs.
The two pairs of lower ribs that are not attached to the chest bone are called C) Floating ribs.

7. C) Pectoral girdle.
This structure connects the upper limbs to the trunk of the body.

8. C) Femur.
The longest bone in the human body is the C) Femur.

9. A) Tibia and Fibula.
The bones of the lower leg are called A) Tibia and Fibula.

ADVANCED LEVEL

More than One Answer Type

10. The primary bones that form a cage around the heart and lungs are B) Ribs.
However, if considering other structures that contribute to the protection of these vital organs, the A) Backbone (or vertebral column) also plays a **r**ole, as it provides additional support and protection for the spinal cord,

which runs alongside the ribcage.

Fill In the Blanks
11. Humerus
12. Femur

Matching Type
13.

1. Skull - C. Protects the brain and contains holes for nose, eyes, ears, and mouth.

2. Spine - A. Forms a long flexible column of bones extending from the neck to the end of the back; protects the spinal cord.

3. Rib Cage - B. Encloses and forms a cage around the heart and lungs; consists of thin, flat, bow-shaped bones joined to the backbone and sternum.

Answer the Following Questions
14. The human vertebral column typically contains 33 vertebrae at birth. However, as we grow, some of these vertebrae fuse together, leading to a total of 26 vertebrae in adulthood.

Reasons for Reduction in Number of Bones:

1. Fusion of Vertebrae: Certain groups of vertebrae, such as the sacral vertebrae (5) and the coccygeal vertebrae (4), fuse to form the sacrum and coccyx, respectively. This fusion helps provide stability and support for the pelvis.

2. Developmental Changes: As we age, the body undergoes changes that can lead to the natural fusion of some vertebrae, which helps in weight distribution and maintaining posture.

This process of fusion allows for a stronger, more stable spine that can better support the body's structure and movements.

15. The cushion of cartilage found in each vertebra, known as the intervertebral disc, plays several important roles:

Significance of Intervertebral Discs:
1. Shock Absorption: The discs act as shock absorbers, helping to ab-

sorb the impact from movements such as walking, running, and jumping. This reduces stress on the vertebrae and the spinal cord.

2. Flexibility and Movement: The discs allow for flexibility and movement of the vertebral column. They enable bending and twisting motions while maintaining stability.

3. Spacing: The discs provide spacing between the vertebrae, which helps maintain the overall height of the vertebral column and prevents the vertebrae from grinding against each other.

Protection of the Spinal Cord:

The vertebral column contributes to the protection of the spinal cord in the following ways:

1. Bony Structure: The vertebrae form a hard, bony canal (the vertebral foramen) that encases the spinal cord, shielding it from physical trauma.

2. Stability: The alignment of the vertebrae creates a stable support system that helps maintain proper posture and alignment, reducing the risk of injury to the spinal cord.

3. Movement Limitation: While allowing for flexibility, the vertebral column also limits excessive movement that could damage the spinal cord.

Overall, the combination of intervertebral discs and the bony vertebral column provides essential support and protection for the spinal cord, ensuring both mobility and safety.

LEARNERS TASK

CONCEPTUAL UNDERSTANDING QUESTIONS (CUQ's)

Multiple Choice Questions

1. B) 14.
The human face is made up of 14 individual bones.

2. D) Brain.
The brain is not a hole; it's an organ that is housed within the skull. The nose, eyes, and mouth all involve openings in the skull.

3. B) Cartilage.
The shape of the nose is primarily supported by cartilage, which provides

flexibility and structure.

4. B) Vertebral Column.
The backbone is also known as the vertebral column.

5. A) 33.
An adult human typically has 33 vertebrae in the backbone, though some may fuse together, resulting in 26 functional vertebrae in adulthood.

6. B) 12.
Humans typically have 12 pairs of ribs, totaling 24 ribs.

7. C) Two.
Humans have two pairs of limbs: the arms and the legs.

8. C) Humerus.
The upper arm bone is called the humerus.

ADVANCED LEVEL

More than One Answer Type

9. A) We have 33 small bones in our backbone: This is generally true, as the adult human spine typically has 33 vertebrae, although some of them fuse together in adulthood.
B) The vertebral column protects the spinal cord: This statement is correct. The vertebral column encases and protects the spinal cord, which runs through the vertebral foramen of the vertebrae.

Fill In the Blanks

10. radius and ulna.
11. 27 bones.

Matching Type

12.

1. Upper part of the skull - B. 8 bones

2. Face - A. 14 bones

3. Cartilage in the nose - D. Long piece of cartilage

4. Vertebra - C. Each bone of the backbone

Answer the Following Questions

13. The three main divisions of the forelimb are:

1. Upper Arm (humerus)

2. Forearm (radius and ulna)

3. Hand (carpals, metacarpals, and phalanges)

Function of the Humerus:

The humerus serves several important functions:

- Support and Movement: It acts as the main support for the upper arm and connects to the shoulder and elbow joints, allowing for a wide range of arm movements, including lifting, reaching, and throwing.

- Muscle Attachment: The humerus provides attachment points for several muscles, including those responsible for flexing and extending the arm.

- Articulation: It forms joints with the scapula at the shoulder and with the radius and ulna at the elbow, facilitating smooth movement and coordination between the upper arm and forearm.

14. Composition of the Hind Limbs

The hind limbs consist of several bones arranged in upper and lower sections:

Upper Section:

1. Femur: The thigh bone, which is the longest and strongest bone in the body.

2. Patella: Also known as the kneecap, it is a small bone that protects the knee joint.

Lower Section:

1. Tibia: The larger and stronger of the two lower leg bones, commonly referred to as the shinbone.

2. Fibula: The thinner bone located alongside the tibia, it provides support and stability but is not weight-bearing.

Significance of the Femur:

- Weight Bearing: The femur supports the weight of the body during standing and walking, making it crucial for locomotion.

- Movement: It allows for a wide range of movements at the hip joint and plays a vital role in activities such as running, jumping, and climbing.

- Muscle Attachment: The femur serves as an attachment point for several major muscles in the thigh, including the quadriceps and hamstrings, which are essential for movement and stability.

- Joint Articulation: The femur articulates with the pelvis at the hip joint and with the tibia at the knee joint, contributing to the overall flexibility and functionality of the lower limb.

Overall, the femur's structural strength and its role in movement and support make it a critical component of the skeletal system.

JOINTS (KEY)

TEACHING TASK

CONCEPTUAL UNDERSTANDING QUESTIONS (CUQ's)

Multiple Choice Questions

1. c) To cushion the ends of bones.
Cartilage in joints serves to absorb shock and reduce friction between the bones, allowing for smooth and pain-free movement.

2. a) Immovable joints.
Immovable joints allow little or no movement, such as the sutures in the skull.

3. b) Hinge Joint.
Hinge joints allow movement in one direction, similar to the way a door opens and closes, such as at the elbow and knee.

4. d) Allows rotation or turning movement.
Pivot joints enable one bone to rotate around another, such as the joint between the first and second vertebrae in the neck, allowing for head rotation.

5. a) Voluntary muscles.
Voluntary muscles are under conscious control and are responsible for movements like reading, writing, walking, and running.

6. b) Pumping blood throughout the body.
Cardiac muscles are specialized muscles found in the heart that are responsible for pumping blood.

ADVANCED LEVEL

More than One Answer Type

7. The correct answers are b) Ball and Socket Joint and d) Gliding Joint.
Ball and Socket Joint allows movement in multiple directions, including rotation.
Gliding Joint allows for sliding movements in multiple directions, though with limited rotation.

8. The correct answers are a) They control the movement of the body, b) They are under our control, and c) They work in pairs.
a) Voluntary muscles are responsible for body movements.
b) They are under conscious control, allowing us to decide when to move them.
c) Many voluntary muscles work in pairs (antagonistic pairs) to facilitate movement.
d) is incorrect because voluntary muscles are primarily skeletal muscles, whereas involuntary muscles are found in internal organs.

Fill In the Blanks

9. Arms
10. Synovial fluid

Matching Type

11.

1. Hinge Joint - C. Allows movement only in one direction

2. Ball and Socket Joint - A. Allows movement in all directions; one bone is like a ball and fits into the hollow socket of the other bone

3. Pivot Joint - B. Allows side to side, upward and downward movement; found between the head and neck, including the joint between the first two vertebrae and the skull (atlas)

4. Gliding Joint - D. Allows bones to slide on each other in various directions along the plane of the joint; found in the wrist and ankle

Answer the Following Questions

12. The type of muscles responsible for controlling voluntary movements like reading, writing, walking, or running are called skeletal muscles. These muscles are under conscious control, allowing us to perform these activities.

13. Cardiac muscles are primarily found in the heart. Their main function is to pump blood throughout the body, contracting rhythmically and involuntarily to maintain circulation and ensure that oxygen and nutrients are delivered to tissues.

LEARNERS TASK

CONCEPTUAL UNDERSTANDING QUESTIONS (CUQ's)

Multiple Choice Questions

1. c) Between bones of the skull.
Immovable joints, or sutures, are commonly found between the bones of the skull, providing stability and protection for the brain.

2. c) To hold the joint together.
Ligaments are strong connective tissues that connect bones to other bones at joints, providing stability and support.

3. c) Hip and shoulders.
The ball and socket joint allows for a wide range of movement and is primarily found in the hip and shoulder joints.

4. d) Gliding Joint.
Gliding joints allow bones to slide past each other in various directions, such as those found in the wrist and ankle.

ADVANCED LEVEL

More than One Answer Type

5. The correct answers are c) Wrist and d) Ankle.
Gliding joints can be found in both the wrist (between the carpal bones) and the ankle (between the tarsal bones). Elbows and knees are hinge joints, not gliding joints.

6. The correct answers are b) Smooth muscles and c) Cardiac muscles.
Smooth muscles are found in internal organs and are not under conscious control.
Cardiac muscles are found in the heart and also operate involuntarily.
a) Voluntary muscles and d) Skeletal muscles are under conscious control, so they are not involuntary.

Fill In the Blanks

7. Ligaments
8. Skull.

Matching Type

9.

1. Voluntary Muscles - C. Control the movement of the body and are under our control.

2. Smooth Muscles - A. Not in our control, work on their own, found in internal organs.

3. Cardiac Muscles - B. Found in the heart, involuntary, responsible for pumping blood throughout the body.

Answer the Following Questions

10. The type of joint that allows movement in all directions and is primarily found in the hip and shoulders is the ball and socket joint.

11. The pivot joint is typically found in the neck (between the first and second cervical vertebrae, called the atlas and axis) and in the forearm (between the radius and ulna).

It facilitates rotational movement, allowing the head to turn side to side and the forearm to rotate, such as when turning the palm up or down.