Chapter 5
Movements in Animals

I. Choose the best answer

Question 1.
Which of the following parts of our body help us in movement?
(i) Bones
(ii) Skin
(iii) Muscles
(iv) Organs
Choose the correct answer from the options below.
(a) (i) and (iii)
(b) (ii) and (iv)
(c) (i) and (iv)
(d) (iii) and (ii)
Answer: (a) (i) and (iii)

Question 2.
Which one of the following organisms lack muscles and skeleton for movement?
(a) Dog
(b) Snail
(c) Earthworm
(d) Human being
Answer:
(b) Snail

Question 3.
…… joints are immovable.
(a) Shoulder and arm
(b) Knee and joint
(c) Upper jaw and skull
(d) Lower jaw and upper jaw
Answer:
(c) Upper jaw and skull

Question 4.
Why do underwater divers wear fin-like flippers on their feet?
(a) To swim easily in water
(b) To look like a fish
(c) To walk on water surface
(d) To walk over the bottom of the sea (sea bed).

Answer:
(a) To swim easily in water

Question 5.
External ear (pinna) is supported by –
(a) bone
(b) cartilage
(c) tendon
(d) capsule
Answer:
(b) cartilage

Question 6.
Cockroach moves with the help of its –
(a) leg
(b) bone
(c) muscular foot
(d) whole body
Answer:
(d) whole body

Question 7.
Which one of the following categories of vertebrae are correctly numbered?
(a) Cervical – 7
(b) Thoracic – 10
(c) Lumbar – 4
(d) Sacral – 4
Answer:
(a) Cervical – 7

II. Fill in the blanks

1. Movement of organisms from place to place is called ……..
2. …….. refers to change in position of the part of an organisms body.
3. A structure which provides rigid frame work to the body is called ……..
4. Axial skeleton in human consists of ……., ……., ……..and ……
5. Appendicular skeleton in human consists of …….. and ……
6. The place where two bones meet is termed as ……
7. …….. is attached to soft parts of the body like blood vessels, iris, bronchi and the skin
8. …….. muscle makes pupil of eyes wider.

Answer:

1. locomotion
2. Movement
3. skeleton
4. Skull facial bones. sternum. ribs, vertebral column
5. Pelvic, Pectoral girdle
6. Joint
7. Smooth muscle
8. Radial

III. State True or False. If false, correct the statement:

Question 1.
Skull in humans consists of 22 bones.
Answer:
True

Question 2.
There are 12 pairs of ribs in human body.
Answer:
True

Question 3.
Pelvic girdle is a part of axial skeleton.
Answer:
False
Correct statement:
Pelvic girdle is a part of appendicular skeleton.

Question 4.
Hinge joint is slightly movable joint.
Answer:
True

Question 5.
Cardiac muscle is a voluntary muscle.
Answer:
False
Correct statement:
Cardiac muscle is a involuntary muscle.

Question 6.
The flexor and extensor muscle of the arm are antagonistic muscles.
Answer:
True

IV. Answer very briefly

Question 1.
What is skeleton?
Answer:

1. The skeleton system provides the hard structure or framework to the human body which supports and protects the body.
2. It is composed of connective tissues like bones, cartilage, tendons and ligaments.

Question 2.
What is cranium?
Answer:

1. Skull has 22 bones of which 8 bones are fixed together to form the cranium.
2. It is called brain box since it protects the brain.

Question 3.
Why our backbone is slightly movable?
Answer:
In the backbone, vertebrae are joined by gliding points, which allow the body to be bent back, front or side wards.

Question 4.
Differentiate axial and appendicular skeleton.
Answer:
Axial skeleton:
The axial skeleton consists of the bones along the axis, or central line of the human body and consists of the skull, facial bones, sternum, ribs, and vertebral column.

Appendicular skeleton:
The appendicular skeleton contains the bones in the appendages of the body, as well as the structures that connect the appendages to the axial skeleton. It comprises the shoulder girdle; the arm, wrist, and hand bones; the pelvic girdle; and the leg, ankle, and foot bones.

Question 5.
What is ligament?
Answer:
A ligament is a band of strong fibrous tissue which connects a bone to a bone.

Question 6.
Define Muscle.
Answer:
Muscles are long bundles of contractile tissue, which has a fixed end (Origin) and movable end which pulls some other part.

Question 7.
Differentiate tendons and ligament.
Answer:
Tendon:

1. They are made of elastic tissue.
2. They attach muscle to a bone

Ligament:

1. They are short bands of tough fibrous connective tissues.
2. They connect one bone to another

V. Answer briefly

Question 1.
Differentiate between the following.

1. Movement and Locomotion.
2. Endoskeleton and Exoskleton
3. Pectoral and Pelvic girdle
4. Ball and socket Joint and Hinge Joint
5. Voluntary and Involuntary muscle

Answer:
1. Movement and Locomotion

Movement:

- Movement is the act of changing the place or position by one or more parts of the body.
- It can either be voluntary or involuntary.
- A movement takes place at the biological level.
- Movement requires energy.

Locomotion:

- Locomotion is the movement of an organism from one place to another.
- It is always voluntary.
- Locomotion takes place at the organism level.
- Locomotion doesn't necessarily require energy.

2. Endoskeleton and Exoskleton

Endoskeleton:

- It is the skeleton found inside the body.
- It originals from mesoderm.
- Example: Human beings.

Exoskleton:

- It is the skeleton found on the exterior layer of the body.
- It originals from embryonic ectoderm or mesoderm.
- Example: Scales of fish feathers of birds

3. Pectoral and Pelvic girdle

Pectroal girdle:

- It is situated in the shoulder region.
- It gives articulation to forelimbs.
- The shoulder blade and collar bone remain separate.
- They are comparatively lighter.

Pelvic girdle:

- It is situated in the hip region.
- It gives articulation to legs or hind limb.
- Three bones (ilium, ischium and pubis) are fused to form a single hip bone.
- They are strong to take upto lot of stress

4. Ball and socket Joint and Hinge Joint

Ball and socket Joint:

- A ball shaped head of one bone articulates with a cup like socket of j an adjacent bone.
- Movement can occur in three planes. This joint allows the greatest range of movement.
- Example: Shoulder, Hip

Hinge Joint:

- A cylindrical protrusion of one bone articulates with a trough-shaped depression of an adjacent bone.
- Movement is restricted to one plane. This joint allows bending and straightening only.
- Example: Elbow Knee Ankle

5. Voluntary and Involuntary muscle:

Voluntary muscle:

- They are striated (Multinucleate muscles and unbranched) muscles.
- They are attached to bones.
- Example: found in arms, legs
- They are used as per our will.

Involuntary muscle:

- They are non – striated (Single muscle, central nucleus) muscles.
- They are attached to soft parts of the body like blood vessels, Iris, Skin etc.
- They are not under our control.

Question 2.
What are antagonistic muscles? Give one example.
Answer:

1. Muscles often work in pairs which work against each other. These are called antagonistic pairs.
2. The muscles in the upper arm control the bending and straightening of the arm.
3. The two muscles, the biceps and triceps are working against each other.
4. When the biceps contracts the lower arm is raised and the arm bends.
5. In this position the triceps muscle is relaxed.
6. To straighten the arm the reverse happens.
7. The triceps contracts straightening the arm, while the biceps relaxes.

Question 3.
How is the skeleton of a bird well-suited for flying?
Answer:

1. A bird has streamlined body. Its bones are light and strong.
2. They are hollow and have air spaces between them.
3. The hind limbs of birds are modified as claws, which help them to walk and to perch.
4. The breast bones are modified to hold massive flight muscles which help in moving wings up and down.
5. Birds have special flight muscles and the forelimbs are modified as wings.
6. The wings and tail have long feathers, which help in flying. Birds show two types of flight: gliding and flapping.

Question 4.
What are the functions of skeleton in human body?
Answer:
The skeletal system serves five important functions in the human body:

1. It provides structure and shape to the body.
2. It supports and surrounds the internal organs of the body.

3. Calcium and phosphorus, the two minerals that the body needs for important regulatory functions, are stored inside the bones.
4. Red blood cells are produced in the bone marrow.
5. The bones of the skeletal system act as levers for muscular action.

Muscular movement would not be possible without tendons (fibrous cords of tissue that attach muscle to bone) and ligaments (fibrous cords of tissue that attach bone to bone).

VI. Answer in detail

Question 1.
Name the different types of joints? Give one example for each type.
Answer:

Joint	Examples
Ball and Socket	Shoulder Hip
Hinge	Elbow Knee Ankle
Pivot	Spine (Atlas / Axis joint at the top)
Condyloid	Wrist
Gliding	Spine (between the bony processes of the vertebrae)
Saddle	Thumb, shoulder and inner ear.

Question 2.
Write about the human axial skeleton, giving suitable labelled diagram.
Answer:
The axial skeleton consists of the bones along the axis or central line of the human body. It consists of the skull, facial bones sternum, ribs and vertebral column.

Skull:

1. It is a hard structure made of 22 bones.
2. 8 bones are fixed together to form the cranium and 14 hones fuse to form the face.
3. The lower jaw is the only movable bone of the skull.

Vertebral column:

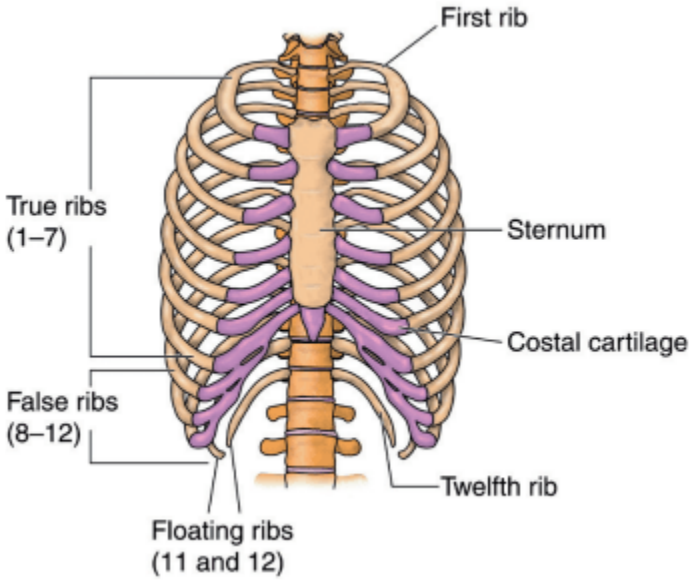
1. It is called the backbone and runs of the back of the body.
2. It is made of 33 individual bones called vertebrae as follows :
    - 7 Cervical vertebrae
    - 12 Thoracic vertebrae
    - 5 Lumbar vertebrae
    - 5 Fused sacral vertebrae
    - 4 Fused coccygeal vertebrae

3. The hollow tube of the vertebral column contains the spinal cord.
4. Vertebrae are joined by gliding points which allow the body to be bent back, front or side – wards.

Function of vertebral column:

1. It protects the spinal cord
2. It supports the head
3. It serves as an attachment for ribs
4. Helps in walking, standing erect and posture.

Sternum or Ribcage:



1. It is a cone shaped structure in the chest region and made up of 12 pairs of ribs.
2. The ribs attached to the vertebral column at the back and the breast bone in the front.
3. There are 12 pairs of ribs.
    - First 10 pairs are attached to breast bone.
    - 2 pairs are called free floating ribs and are free in the front.
4. Rib cage can contract and expand during breathing.
5. It protects the lungs, hearts and a part to the liver.

Question 3.
Discuss various types of movements seen in living organisms.
Answer:
There are three types of movements:

1. Amoeboid movement:
It is brought about by pseudopodia which are appendages which move with movement of protoplasm within a cell.

2. Ciliary movement:
This movement is brought about by appendages called as cilia which are the hair-like extensions of the epithelium. Both these kinds of movements are seen with cells of the lymphatic system.

3. Muscular movement:
It is a more complex movement which is brought about by the musculoskeletal system. This type of movement is seen in the higher vertebrates.
Example: Human beings.

The movements brought about by the musculoskeletal system, comprising of the joints, skeleton and types of muscles.

Some of the movements in body parts of human are:

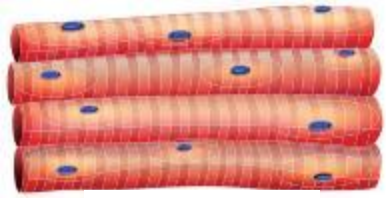
1. Movement of eyelids.
2. Movement of the heart muscles.
3. Movement of teeth and jaw.
4. Movement of arms and legs.
5. Movements of head.
6. Movements of neck.

Question 4.
What is a streamlined body? How does it help in the movement of animals that fly or swim in water?
Answer:
1. A streamlined body is one which is pointed at the ends and broad in the middle. When such a body travels through a fluid or gaseous medium it exhibits minimum friction or resistance. A body shape which is streamlined helps cut against the friction created by the medium around the moving body.

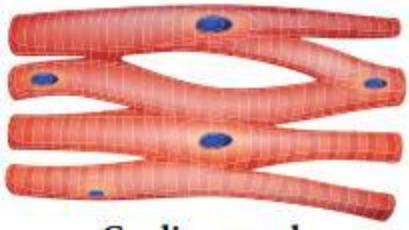
2. Streamlined body lowers the friction drag between a fluid, air or water and an object moving trough that fluid. Drag is a force that slows down motion. Streamlining reduces the surface area of the moving object.

3. Streamlining reduces friction of movement to a minimum thus decreasing overall drag. Fishes can save energy while swimming because of the streamlined body.

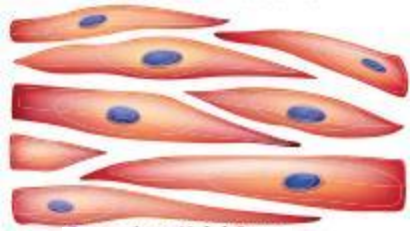
Question 5.
Write a short note on different types of muscles.
Answer:



Skeletal muscle



Cardiac muscle



Smooth muscle

Muscles found in higher vertebrates are of three types:

1. Striated or skeletal muscles or voluntary muscles.
2. Unstriated or smooth muscles or involuntary muscles.
3. Cardiac muscles.

Muscle	Location	Characteristics
Striated / Skeletal / Voluntary muscle	Attached to bones. Found in arms, legs, neck.	Multinucleate, Unbranched, Voluntary.
Non striated / Smooth / Involuntary muscle	Attached to soft parts of the body like blood vessels, iris, bronchi and the skin.	Single, central nucleus Involuntary
Cardiac muscle	Heart	Branched, 1 -3 central nuclei Involuntary