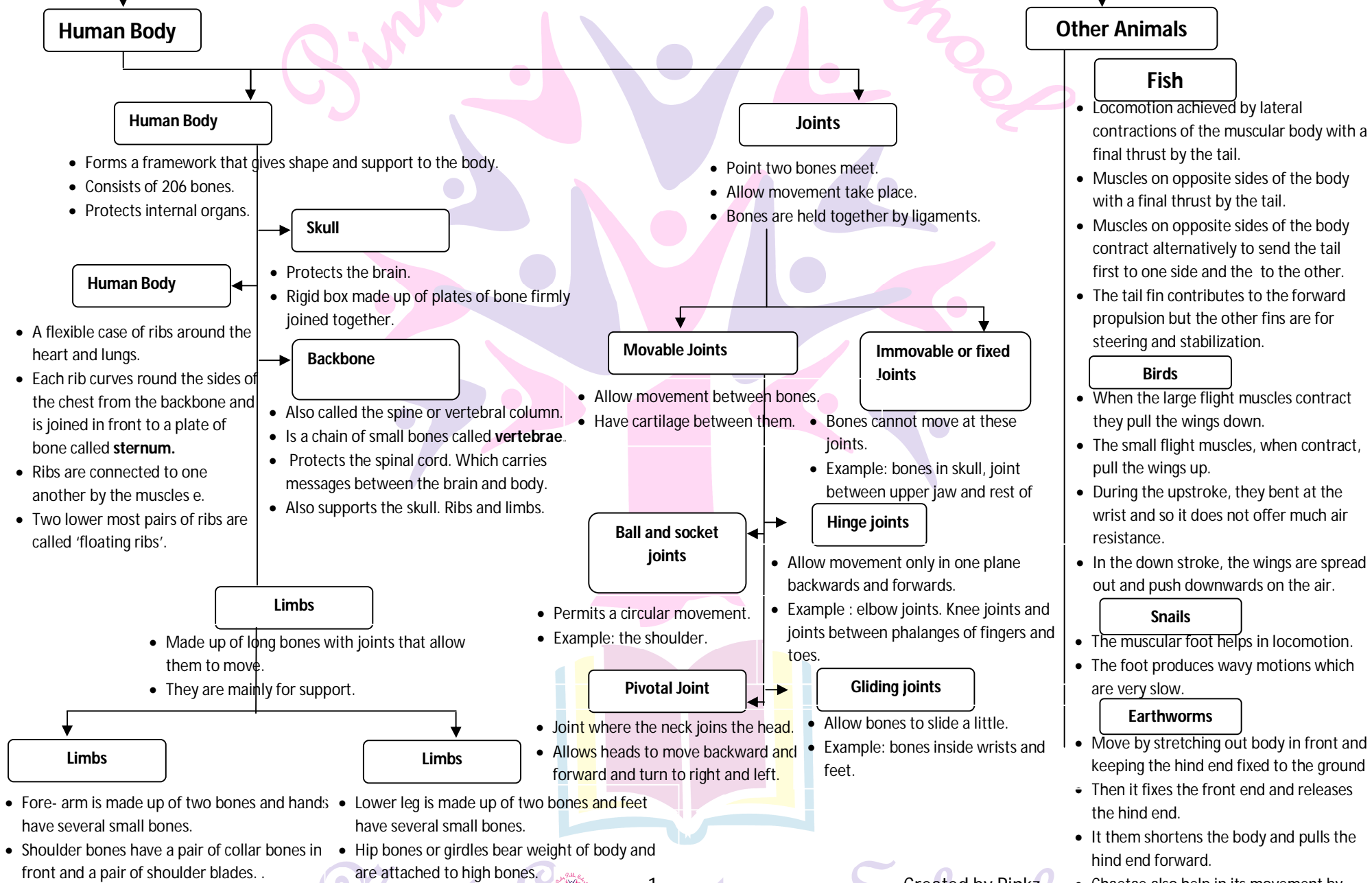


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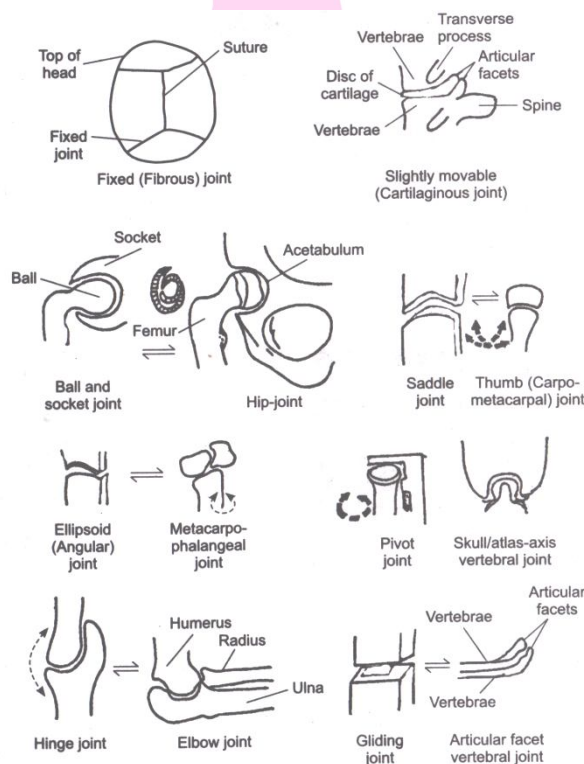
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LOCOMOTION

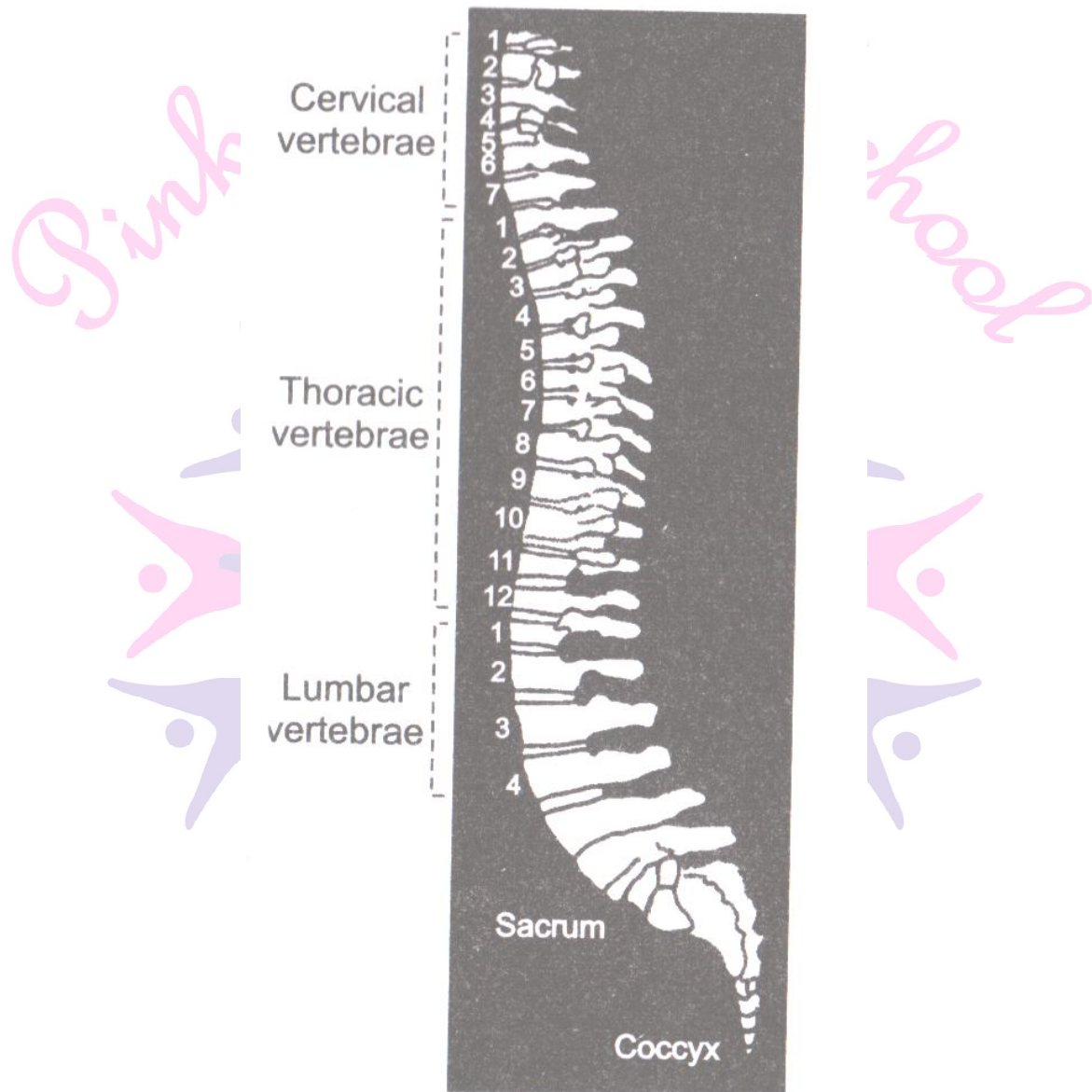


## I. Know the Terms

- **Cell** : Cell is the structural and functional unit of all living organisms.
- **Tissue**: A group of similar cells with same kind of function is called a tissue.
- **Muscles**: Muscular tissue consists of elongated cells called muscle fibres. Muscles contain special proteins called contractile proteins, which contract and relax to support movements.
- **Bone**: It is a strong and non-flexible tissue. It forms the framework that supports the body. It also anchors the muscles.
- **Skeleton**: A hard internal or external framework of bones, cartilage, shells, woody fibre, supporting the body of an organism is called skeleton.
- **Joint**: The place where two or more bones meet together is called a joint.
- **Fixed Joint**: The joint which do not allow movements is called fixed joint.
- **Synovial Joint**: Freely movable joints are also called synovial joints or perfects joints because they allow free movement in one or more directions.
- **Ball and Socket Joint**: The joint which allows movements in all directions is called ball and socket joint. For example, joint between upper arm and shoulder.
- **Pivotal Joint**: The joint which allows movement in many planes is called pivotal joint. For example, skull makes such joint with the first two vertebrae.
- **Hinge Joint**: The joint which allows movement only in one direction is called hinge joint. For example, fingers.



- **Rib Cage:** 12 pairs of ribs along with backbone make a cone-shaped cage which protects the lungs and heart is called rib cage.
- **Backbone:** Vertebral column or backbone is slightly curved and slightly movable string of ring-shaped bones or vertebrae.



- **Skull :** The bony or cartilaginous framework of the head of vertebrates.
- **Rib cage:** A protective cage formed by ribs around the organs in our chest region.
- **Limbs:** The joined appendages of an animal such as an arm or leg, usually used for locomotion or grasping things.
- **Vertebrates:** Animals with a backbone.

## I . Multiple choice questions

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 : **[NCERT Exemplar]**  
 (a) (i) and (iii) (b) (ii) and (iv) (c) (i) and (iv) (d) (iii) and (ii)
2. Which of the following joints is immovable ? **[NCERT Exemplar]**  
 (a) Shoulder and arm (b) Knee and elbow  
 (c) Upper jaw and skull (d) Lower jaw and upper jaw
3. Which of the following organisms does not have both muscles and skeleton for movement ? **[NCERT Exemplar]**  
 (a) Dog (b) Snail (c) Earthworm (d) Human being
4. The organs for locomotion in an earthworm are :  
 (a) Segments (b) Slime (c) Muscles (d) Setae
5. The bones at joints are held together by :  
 (a) Cartilage (b) Ligaments (c) Muscles (d) Tendons
6. The joint at the elbow is the \_\_\_\_\_ joint.  
 (a) Pivot (b) Hinge (c) Ball and socket (d) Gliding
7. A cord of dense tissue that connects a muscle to a bone is a :  
 (a) Ligament (b) Tendon (c) Cartilage (d) Fibre
8. Underwater divers wear fin-like flippers on their feet to : **[NCERT Exemplar]**  
 (a) Swim easily in water (b) Look like a fish  
 (c) Walk on water surface (d) Walk over the bottom of the sea (sea bed).
9. Snail moves with the help of its : **[NCERT Exemplar]**  
 (a) Shell (b) Bone (c) Muscular foot (d) Whole body
10. How many muscles work together to move a bone ? **[NCERT Exemplar]**  
 (a) One (b) Two (c) Three (d) Four

1. (a)	2. (c)	3. (c)	4. (d)	5. (b)
6. (b)	7. (b)	8. (a)	9. (c)	10. (b)

**I. Match the following**

(I) Column A	Column B
(a) Fish	(i) protect heart.
(b) Upper jaw	(ii) have fins and streamlined body.
(c) Ribs	(iii) is an immovable joint.
(d) Snail	(iv) has exoskeleton and fast movement.
(e) Cockroach	(v) has exoskeleton but can move slow.

<b>a. ii</b>	<b>b. iii</b>	<b>c. i</b>	<b>d. v</b>	<b>e. iv</b>
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(II) Column A	Column B
(a) Fixed joint	(i) Head on backbone
(b) Ball and socket joint	(ii) Backbone joints
(c) Pivotal joint	(iii) Skull joints
(d) Hinge joint	(iv) Upper arm and shoulder
(e) Gliding joint	(v) Fingers, knee, elbow

<b>a. iii</b>	<b>b. iv</b>	<b>c. i</b>	<b>d. v</b>	<b>e. ii</b>
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(III) Column A	Column B
(a) Femur	(i) Make up the spine
(b) Bone	(ii) Hip bone
(c) Vertebrae	(iii) Cushions bones at joints
(d) Pelvis	(iv) Contains calcium
(e) Cartilage	(v) Thigh bone

<b>a. v</b>	<b>b. iv</b>	<b>c. i</b>	<b>d. ii</b>	<b>e. iii</b>
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**II. Match the following**

(I) Column A	Column B
a. Human being	i. Fins
b. Cow	ii. Wings
c. Snake	iii. Legs
d. Eagle	iv. Whole body
e. Fish	v. Limbs

a. iii	b. v	c. iv	d. ii	e. i
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**III. Match the following**

(I) Column A	Column B
i. Joint	a. Move by forming loops alternately on two sides of the body.
ii. Snakes	b. Crawl on the ground
iii. Fish	c. A place where two bones meet together
iv. Leech	d. Joins bones to muscles
v. Tendon	e. Swims with the help of muscles

i. c	ii. a	iii. e	iv. b	v. d
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**I. True or False**

- The movement and locomotion of all animals is exactly the same.
- The cartilage are harder than bones.
- The finger bones do not have joints.
- The fore arm has two bones.
- Cockroaches have an outer Skeleton.

1. False	2. False	3. False	4. True	5. True
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## II. True or False

1. The bones are soft while cartilages are hard.
2. Cockroaches cannot walk.
3. All the joints in our body are similar.
4. A human baby borns with about 206 bones.
5. Upper jaw is immovable.

1. False	2. False	3. False	4. False	5. True
----------	----------	----------	----------	---------

## I. Fill in the blanks

1. A combination of bones and cartilages forms the \_\_\_\_\_ of the body.
2. The bones at the elbow are joined by a \_\_\_\_\_ joint.
3. The contraction of the \_\_\_\_\_ pulls the bones during movement.

1. Skeleton	2. Hinge	3. Muscle
-------------	----------	-----------

## II. Fill in the blanks

1. Organs inside our body are called \_\_\_\_\_ organ.
2. Birds like \_\_\_\_\_ and swans can swim in water.
3. Lower jaw is \_\_\_\_\_.
4. \_\_\_\_\_ is the strongest and longest bone in the body.
5. A group of similar \_\_\_\_\_ with same kind of function is called a tissue.

1. internal	2. ducks	3. movable	4. Thigh bone	5. cells
-------------	----------	------------	---------------	----------

## III. Fill in the blanks

1. Joints of bones help in \_\_\_\_\_ of the body.
2. Elbow joint is a \_\_\_\_\_ joint.
3. Contraction of \_\_\_\_\_ causes pulling of bone.
4. \_\_\_\_\_ bone is the longest and the strongest bone in human body.
5. \_\_\_\_\_ joints are immovable or fixed joints.
6. Hollow space in bone is called \_\_\_\_\_.

7. Bone marrow is present in \_\_\_\_\_ of bones.
8. The place where two bones meet, is called \_\_\_\_\_.
9. Bones can't bend as \_\_\_\_\_.
10. There are \_\_\_\_\_ types of joints in human skeleton.

1. movement	2. hinge	3. muscles	4. Femur	5. Suture
6. cavity	7. cavity	8. joint	9. cartilage	10. five.

### Quiz Time

1. Name the functional and structural unit of the body.
2. What is a group of similar cells with same kind of function called?
3. What is cartilage?
4. If you tie a scale with your arm, are you able to bend your elbow? Why?
5. Can bones be bent?
6. Give two examples of hinge joint.
7. What are three components of skeleton?
8. Write the name of a bird which can swim in water.
9. Name the organs protected by rib cage.
10. Write the names of three animals that have streamlined body.

### Answer

1. Cell
2. Tissue
3. The bone like structure which is soft and elastic in nature and can be bent is called cartilage.
4. No, it prevents functioning of elbow joint.
5. No
6. (i) In fingers                      (ii) In knee
7. (i) Bones                      (ii) Cartilage                      (iii) Joints
8. Duck
9. Heart and Lungs.
10. (i) Fish                      (ii) Birds                      (iii) Snake



Intext Questions

1. Plants do not move from one place to another. Do they show any other kind of movement ? What types of movements are shown by plants ?

Yes, plants shown other kinds of movements. The movements shown by plants are of following types : (i) Response to external stimuli (ii) Movement of roots towards water etc.

2. Fill in the table to explain how animals move from place to place.

Animals	Body parts used for moving from place to place	How does the animal move ?
Cow	Legs	Walk
Humans	_____	_____
Snake	Whole body	Slither
Bird	_____	_____
Insect	_____	_____
Fish	_____	_____

Answer:

The table to explain the movement of animals from place to place is given below :

Animals	Body parts used for moving from place to place	How does the animal move ?
Cow	Legs	Walk
Humans	Legs	Walk and run
Snake	Whole body	Slither
Bird	Wings	Fly
Insect	Wings/setae	Fly, walk, creep and crawl
Fish	Fins	Swim

3. Why is it that we are able to move a few parts or our body easily in various directions and some only in one direction ?

The movement depends on the type of joints which join two bones together. The body parts having ball and socket joint move in all directions while the body parts having hinge joint move only in one direction.

4. Write Yes/No in the given table to show movements in our body.

Body parts	Movement				
	Rotates completely	Bends partly / turns	Bends	Lifts	Does not move at all
Neck		Yes			
Wrist					
Finger					
Knee					
Ankle					
Toe					
Back					
Head					
Elbow					
Arm	Yes				

Answer: The movements in our body are shown in following table :

Body parts	Movement				
	Rotates completely	Bends partly / turns	Bends	Lifts	Does not move at all
Neck	No	Yes	Yes	No	No
Wrist	Yes	No	Yes	Yes	No
Finger	No	No	Yes	No	No
Knee	No	No	Yes	No	No
Ankle	No	Yes	Yes	No	No
Toe	No	No	Yes	No	No
Back	No	No	Yes	No	No
Head	No	No	No	No	No
Elbow	No	No	Yes	Yes	No
Arm	Yes	No	Yes	Yes	No

### 5. How do we bend our elbow ?

The joint present at the elbow is hinge joint that helps in its bending. The large muscle of the upper arm flexes the arm and powerfully twists the fore arm, turning the palm upward.

### 6. How many bones does middle finger have ?

Middle finger has three bone.

## 7. How does earthworm fix parts of its body to the ground ?

Earthworm has a large number of tiny bristle projections. These bristles are connected with muscles, which help the earthworm in fixing parts of its body to the ground.

### Intext Questions

#### 1. Answer the following.

- a. What is ball and socket joint?
- b. Which of the skull bones are movable?
- c. Why can our elbow not move backwards?

a. A ball and socket joint is the joint in which the rounded end of one bone fits into the cavity (hollow space) of the another bone. Such a joint allows movements in all directions.

b. Lower jaw of the skull is movable.

c. Elbow has hinge joint due to which our elbow can not move backwards.

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### I. Very Short Answer Type Questions

#### 1. What type of skeleton does a snail have ?

Snail has exoskeleton.

#### 2. Why is our backbone not fixed ?

Backbone is not fixed so that we can bend it.

#### 3. Cartilage provides the shape to our body and also lubrication in movement. Is it true ?

Yes, it is true.

#### 4. What provides rigid surface for attachment of muscles ?

Skeleton provides rigid surface for attachment of muscles.

#### 5. What modifications do birds have for flying ?

Forelimbs of birds are modified to wings which help them in flying.

#### 6. Are scales of fish endoskeleton or exoskeleton ?

Scales of fish are exoskeleton.

#### 7. Which part of the skull encloses the brain ?

Cranium encloses brain.

**8. Name the joint where our neck joins the head.**

The joint where our neck joins the head is a pivotal joint.

**9. Name the joints where bones cannot move.**

The bones cannot move at fixed joints.

**10. Which bones enclose the portion of our body below the stomach.**

Pelvic bones enclose the portion of our body below the stomach.

**11. What do you understand by the term "Gait of animals ?**

"Gait of animals" refers to the way of movement in animals. Different animals have different body parts that help them to move. Aristotle, an ancient Greek philosopher, wrote the book "Gait of Animals.

**12. Which one of the following animals has a streamlined body ? Cockroach, Snake, Fish or Snail?**

Fish.

**13. Identify the type of joint in the figure given below.**



Ball and Socket joint.

**14. Name the type of joint in your hand which helps you to grasp a badminton racquet.**

[NCERT Exemplar]

Hinge joint.

**15. What would have happened if our backbone was made of one single bone?**

[NCERT Exemplar]

If our backbone was made of one single bone, then we would not have been able to bend from waist of our body.

**16. How does a streamlined body help in movement of animals that fly or swim in water?**

A streamlined body is thicker in middle and tapers at both ends. This shape allows water to move easily around the body and offers least resistance to its flow.

17. Provide one word answers to the statements given below :

- (1) Joint which allows movement in all directions.
- (2) Hard structure that forms the skeleton.
- (3) Part of the body with a fixed joint.
- (4) Help in the movement of body by contraction and relaxation.
- (5) Bones that join with chest bone at one end and to the backbone at the other end .
- (6) Framework of bones which gives shape to our body.
- (7) Bones which enclose the organs of our body that lie below the abdomen.
- (8) Joint where our neck joins the head.
- (9) Part of the skeleton that forms the earlobe. [NCERT Exemplar]

- (1) Ball and socket joint
- (2) Bones
- (3) Upper jaw with skull
- (4) Muscles
- (5) Ribs
- (6) Skeleton
- (7) Pelvic bones
- (8) Pivotal
- (9) Cartilage

18. Write the type of joint which is used for each of the following movements :

- (a) A cricket bowler bowls the ball.
  - (b) A girl moves her head in right and left direction. [NCERT Exemplar]
  - (c) A person lifts weights to build up his biceps.
- (a) Ball and socket joint                      (b) Pivotal joint                      (c) Hinge joint

## II. Very Short Answer Type Questions

1. What do you mean by movement?

The changing position of the body or any part of the body is called movement.

2. At which part does the arm rotate?

The arm rotates on the round pit-like structure.

**3. If you tie a scale with your arm, are you able to bend your elbow?**

No, we cannot bend our elbow.

**4. Name the places where two parts of the body are seen to be joined together.**

These places are called joint.

**5. If there are no joints then will it be possible to move?**

No, it is not possible.

**6. Can bones be bent?**

No, bones cannot be bent.

**7. Can we bend our body at every part?**

No, we can bend our body only at joints.

**8. How many types of joints are there?**

There are five types of joints in our body.

**9. Name the various types of joint.**

- (i) Ball and socket joints      (ii) Pivotal joints      (iii) Hinge joints  
(iv) Fixed joints      (v) Gliding joints

**10. What is cavity in bone?**

The hollow space in the bone is called cavity.

**11. Give two examples of ball and socket joint.**

- (i) Joint of upper arm and shoulder. (ii) Joint of thigh and the hip.

**12. Give an example of pivotal joint.**

The joint of skull with backbone.

**13. Give two examples of hinge joints.**

- (i) Joints in fingers      (ii) Joints in knees

**14. Give an example of fixed joint.**

Joint of cranium skull.

**15. Give an example of gliding joint.**

The joint in backbone.

**16. What is skeleton?**

The framework of bones in our body is called skeleton.

**17. What are ribs?**

The bones of the chest are called ribs.

**18. What is rib cage?**

Ribs are joined with backbone to form a box. this box is called rib cage.

**19. What are shoulder bones?**

The shoulder bones are formed by the collar connects the upper part of the chest and bones of the arm.

**20. What are pelvic bones?**

The, bones which enclose the body part below the stomach are called pelvic bones.

**21. What are cartilages?**

Some additional parts of the skeleton which are not as hard as bone are elastic in nature and can be bent are called cartilages,

eg:: ear pinna, nose tip.

**22. Name the three components of skeleton.**

Skeleton is made up of many bones, joints and cartilage.

**23. Name the parts of the body which help in movement.**

Contraction and relaxation of muscles, bones and joints help in movement.

**24. Name two animals which move without bones.**

(i) Earthworm

(ii) Snail

**25. Give an example of animal which can walk, climb and fly in the Air**

Cockroaches.

**26. Name the organ in cockroach which helps in walking.**

The three pairs of legs in cockroach help in walking.

**27. Which part of the cockroach which helps in flying.**

There are two pairs of wings attached to the breast which help them in flying.

**28. Name a bird which can swim in water.**

Duck.

**29. What do you mean by streamlined?**

If the body tapers at both the ends then such shape of the body is said to be streamlined.

**30. How does the snake move?**

Snakes have a long backbone and many thin muscles which help the snake's body curves into many loops. Each loop of the snake push by pressing against the ground.

**31. What do you mean by fractured bone?**

Fractured bone means broken bone.

**32. Why are fractured bones plastered?**

Plaster keeps broken bones at their right place so that they grow and join properly.

**33. Name organs that are protected by the rib cage?**

Heart and lungs.

**34. Why do we need two muscles together to move a bone?**

A muscle can only pull, it cannot push. Thus, two muscles are required to work together to move a bone. When one muscle contracts, the bone is pulled. When another muscle of the pair pulls, it brings the bone in its original position.

**35. Name three animals that have streamlined body.**

Fish, Birds, Snake.

**36. Many people suffer from a problem called arthritis. Explain its connection with movement.**

Arthritis is the pain in joints. With this problem people find difficulty in moving from one place to another.

**37. How is a bird's body adapted for flying?**

The following adaptations are seen in the body of birds.

- (i) Bones are hollow.
- (ii) Forelimbs are modified into wings.
- (iii) Body is streamlined.

**38. What are ligaments?**

Bones are joined together at joints by strong tissues which are called ligaments.

**39. What are tendons?**

Strong muscle fibres which attaches muscles to the bone are called tendons.

**40. How many vertebrae are there in back bone?**

33 Vertebrae.

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## I. Short Answer Type Questions

**1. Compare between bones and cartilage.**

Bones are rigid and non-flexible whereas cartilage is semi-rigid but flexible. Bones form framework of whole body whereas cartilage forms framework only for a little part of body.

**2. Explain the working of muscles.**

Muscles always work in pairs. When one of them contracts, the bone is pulled in that direction. The other muscle of the pair relaxes. To move the bone in the opposite direction, the



relaxed muscle contracts to pull the bone to its original position. A muscle can only pull. It cannot push.

### **3. What do you mean by endoskeleton ?**

The part of skeletal system that is inside the body and covered by soft tissues is endoskeleton. It cannot be seen from outside. One can feel or see it through X-ray photography only.

### **4. How does a fish swim ?**

Fish has a spindle-shaped streamlined body. This shape of the body helps it to move in water. Fish use their muscular tail and fins for swimming.

### **5. What is a backbone ?**

The backbone extends from the neck to the hip. It consists of many small bones called vertebrae joined end to end. The ribs are joined to these bones.

### **6. What is cartilage ? Where do we find it ?**

Cartilage is the part of the skeleton that is not as hard as the bones. It can be bent easily. We can find the cartilage in the upper part of ear.

### **7. What is a ball and socket joint ?**

In ball and socket joint, the round end of one bone fits into the cavity of the other bone, e.g., thigh and hip joint. This type of joint allows movement in all directions.

### **8. What is a fixed joint ? Give an example.**

Fixed joint is the one where there is no relative movement of the bones. The joint between the head and the upper jaw is an example of fixed joint.

### **9. Describe the way of movement in a snail.**

Body of the snail is covered with a hard shell. This shell does not help the snail in movement. Head of the snail may come out of an opening in the shell. The snail with a wavy motion. strong muscular foot. Foot moves slowly with a wavy motion.

### **10. What are setae ? Mention their role in movement.**

Setae are bristle-like projections on the lower side of the bodies of earthworms and leeches. As earthworm does not have bones, muscles help it to extend and contract the body to help in its movement. The bristles are connected with muscles. The bristles help to get a good grip on the ground.

### **11. Earthworms are known as farmer's friends. Why?**

**[NCERT Exemplar]**

Earthworms are known as 'farmer's friends' because they increase the fertility of soil by excreting undigested materials in soil, as they eat soil.

12. Give below is a list of different types of movements in animals.

(Running, Jumping, Walking, Slithering, Crawling, Flying, Swimming, Creeping)

Write the types of movements seen in each animal.

- a. Duck                      b. Horse                      c. Kangaroo                      d. Snail  
e. Snake                      f. Fish                      g. Human beings                      h. Cockroach

[NCERT Exemplar]

a.	Duck	Walking, flying and swimming
b.	Horse	Walking and running
c.	Kangaroo	Jumping and walking
d.	Snail	Creeping
e.	Snake	Slithering
f.	Fish	Swimming
g.	Human beings	Walking and running
h.	Cockroach	Walking and flying

13. Boojho fell of a tree and hurt his ankle. On examination the doctor confirmed that the ankle was fractured. How was it detected? [NCERT Exemplar]

It was detected by X-ray of the ankle. X-ray images can confirm any type of injury or fracture in the bones.

14. Bones are hard structure and cannot be bent. But, we can still bend our elbow, knee, etc. How is this possible? [NCERT Exemplar]

This is possible by the presence of joint in elbow, knee etc. Elbow and knee have hinge joint.; this joint along with the muscles helps us to bend the elbow and knee.

15. Which type of movement would have been possible if.

- a. Our elbow had a fixed joint.  
b. We are to have a ball and socket joint between our neck and head.

[NCERT Exemplar]

- a. If our elbow had a fixed joint then we would not be able to bend our arms.  
b. If we have a ball and socket joint between our neck and head, then we would be able to rotate our head  $360^{\circ}$ .

## II. Short Answer Type Questions.

### 1. Write three functions of the skeleton.

- i. Protects internal organs,
- ii. Allows movement,
- iii. Gives shape and support to the body.

### 2. Write two features of a fish's body that enables it to move in water.

- i. Streamlined shape of the body.
- ii. Powerful body muscles to move its tail and fins.

### 3. Write the special features that help a bird to fly.

The body is streamlined, bones are light and spongy, bones of forelimbs are modified into wings.

### 4. Why are at least two muscles needed to move a bone at a joint in one direction?

Because one muscle would contract and the other would extend at the joint for movement.

### 5. Why are the bones in the foot normally set in an arch?

The arched feet gives good support. The smaller toe bones help in walking and running.

## III. Short Answer Type Questions.

### 1. What are joints? Write the names of various types of joints.

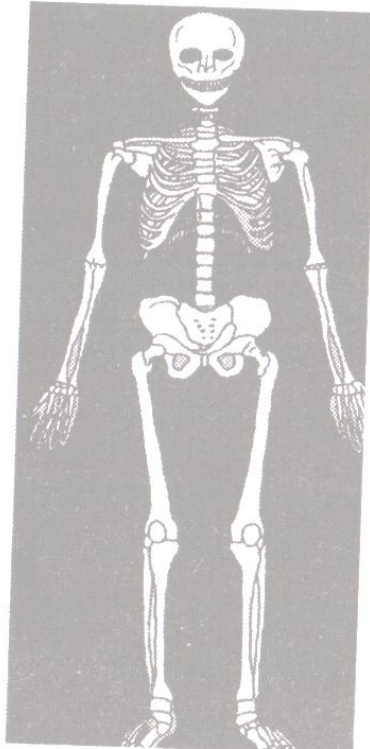
The places where two parts of the body seem to be joined together are called joints.

There are following types of joints:

- |                            |                     |                    |
|----------------------------|---------------------|--------------------|
| (i) Ball and socket joints | (ii) Pivotal joints | (iii) Hinge joints |
| (iv) Fixed joints          | (v) Gliding joints  |                    |

### 2. What is skeleton? Draw a diagram to show the human skeleton.

The bones in our body form a framework to give a shape to the body. The framework is called skeleton.



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**3. Write two ways by which we may know the shape of human skeleton.**

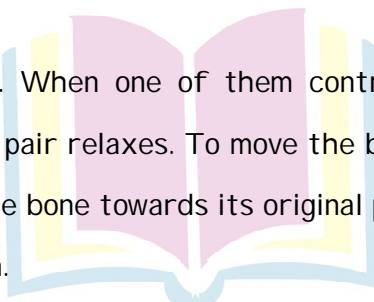
- (i) We can know the shape of human skeleton by feeling.
- (ii) We could know the shape by X-ray images of human body.

**4. Write the differences between bones and cartilage.**

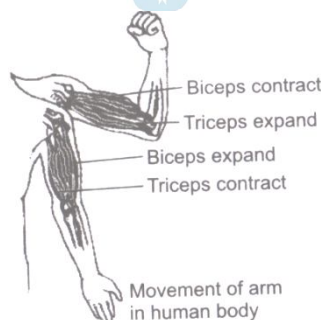
Bone	Cartilage
(i) They are hard and inflexible	i. They are soft and flexible
(ii) They cannot bend.	ii. They can bend
(iii) They make the framework of whole body	They make some parts of the body.

**5. How do the muscles work?**

The muscles work in pairs. When one of them contracts, the bone is pulled in that direction, the other muscle of the pair relaxes. To move the bone in the opposite direction, the relaxed muscle contracts to pull the bone towards its original position, while the first relaxes. A muscle can only pull. It cannot push.

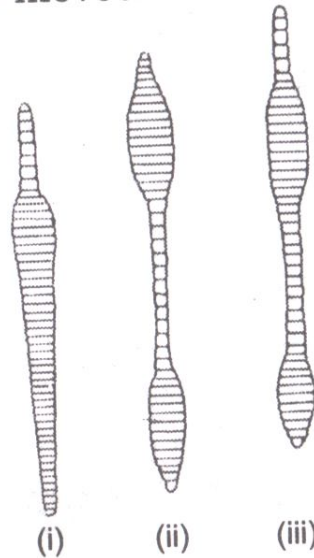


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## 6. How does the earthworm move?

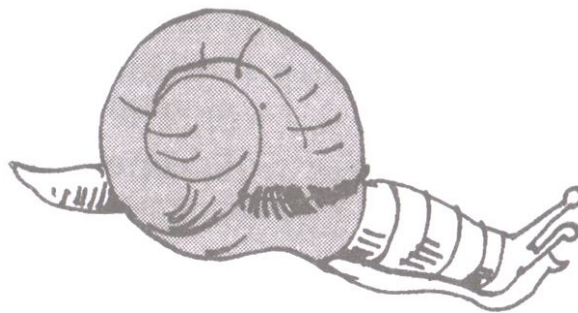
Earthworm does not have bones. It has muscles. During the movement, earthworm first extends front part of the body keeping the rear portion fixed to the ground. Then it fixes the front and releases the rear end. It then shortens the body and pulls the rear end forward. In this way by repeating such muscular expansions and contractions earthworm moves.



Locomotion in earthworm: (i) Front end elongates, rear end fixes to the ground, (ii) Front end fixes to the ground and rear end pulled forward, (iii) The cycle repeats.

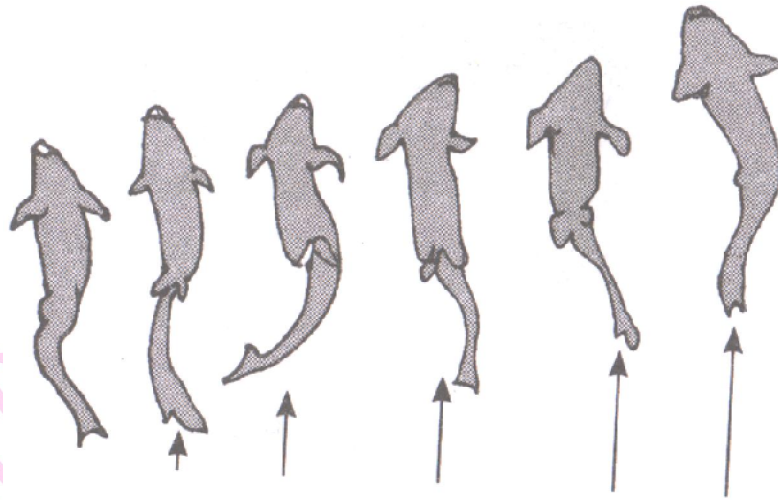
## 7. How does the snail move?

The rounded structure on the back of the snail is called shell. It is the outer skeleton (exoskeleton) of snail. When it starts moving a thick structure and the head of the snail may come out of an opening in the shell. The thick structure is called foot, which is made up of strong muscles. It helps snail in moving.



## 8. How does fish move in water?

The body of fish is streamlined. The streamlined shape helps the fish to move in water. The skeleton fish is covered with muscles which make the front part of the body to curve to one side and the tail part swings towards the opposite side. This makes a jerk and pushes the body forward. In this way it moves in water.



9. Write two differences between the movements of plants and animals.

Plants	Animals
1. Plants are fixed	1. Animals move from place to place
2. Movement in plant, takes place in the form of growth which takes place throughout the life.	2. The growth of animals takes place up to a certain age.

10. Name the longest and smallest bone in the human body.

- i. The longest bone in the human body is the femur (thigh bone). It is about 45 cm long.
- ii. The smallest bone in the human body is stapes (inside the ear).

### I. Long Answer Type Questions

1. Describe the skeletal system. Write / mention two functions of it.

The framework of bones and supports the body of an animal is system.

Human skeletal system is made up of 206 bones and cartilage.

The human skeletal system consists of the skull, backbone, ribs, breastbone, bones in arms and legs, shoulder and hip bones.

**Functions of the skeletal system :**

- (i) It forms framework of the body.
- (ii) It helps to protect the delicate organs of the body in their proper positions.

2. Describe the skeleton of a cockroach.

Cockroaches walk and climb as well as fly in the air. They have three pairs of legs which help them in walking. The body is covered with a hard outer skeleton. This outer skeleton is

made of different units joined together which permit movement. There are two pairs of wings attached to the thorax. The cockroaches have distinct muscles—those near the legs move the legs for walking. The thoracic muscles move the wings when the cockroach flies.

3. (a) Unscramble the jumbled words and write them in the blank spaces provided.

- (i) neosb      (ii) tnemevom      (iii) iontcaronct      (iv) Isecsum  
 (v) arctigeal      (vi) epahs      (vii) sangro inerlant      (viii) laxaeriont

(b) Read the following paragraph and fill in the blanks using the words you unscrambled.

\_\_\_\_\_ (i) \_\_\_\_\_ and \_\_\_\_\_ (ii) \_\_\_\_\_ form the skeleton of the human body. They provide the framework, give \_\_\_\_\_ (iii) \_\_\_\_\_ to the body and help in \_\_\_\_\_ (iv) \_\_\_\_\_. They protect the \_\_\_\_\_ (v) \_\_\_\_\_. The bones are moved by alternate \_\_\_\_\_ (vi) \_\_\_\_\_ and \_\_\_\_\_ (vii) \_\_\_\_\_ of two sets of \_\_\_\_\_ (viii) \_\_\_\_\_ attached to them.

[NCERT Exemplar]

Answer

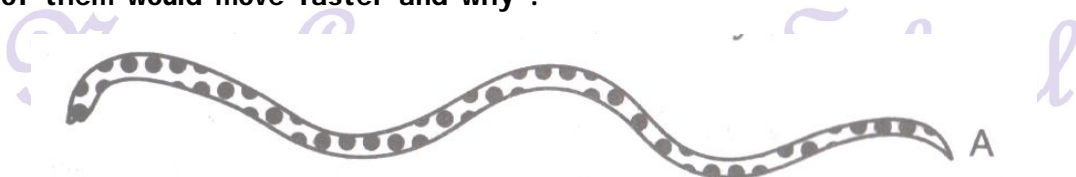
- (a) (i) bones      (ii) movement      (iii) contraction      (iv) muscles  
 (v) cartilage      (vi) shape      (vii) internal organs      (viii) relaxation
- (b) (i) Bones      (ii) cartilage      (iii) shape      (iv) movement  
 (v) internal organs      (vi) contraction      (vii) relaxation      (viii) muscles

4. How is the skeleton of a bird well-suited for flying ? [NCERT Exemplar]

The skeleton of a bird is well-suited for flying because of its following features :

- (i) Hollow bones with light weight.
- (ii) Bones of forelimbs are modified as wings.
- (iii) Bones of hind limbs are used for walking and perching.
- (iv) Strong shoulder bones which help in flying.
- (v) Breast bones hold flight muscles and are used to move the wings up and down for flying.

5. In Fig. there are two snakes of the same size slithering on sand. Can you identify which of them would move faster and why ?





[NCERT Exemplar]

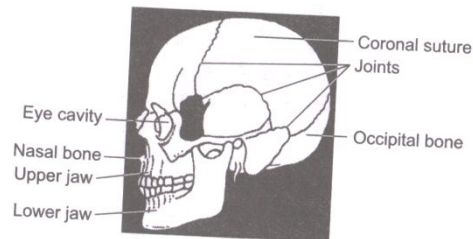
Snake A will move faster snake A contains more loops as compared to snake B. A snake forms loops in its body while slithering. Each loop of the snake gives it a forward push by pressing against the ground. Greater the number of loops in a snake, faster will be the speed of the snake.

## II. Long Answer Type Questions

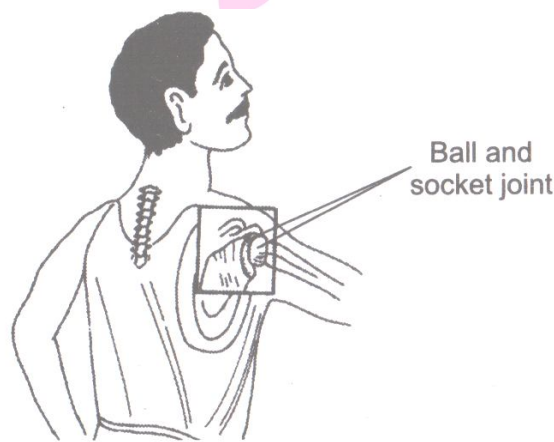
1. Explain various kinds of joints found in our body and give example of each.

There are five types of joints in our body.

i. Fixed joints : Those joints which do not allow movement are called fixed joint.



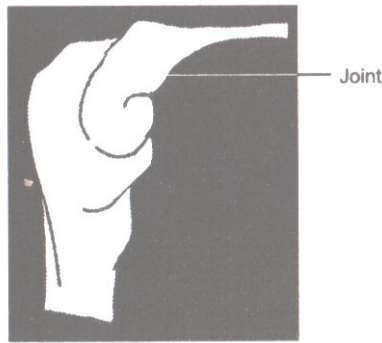
ii. Ball and socket joint: This joint allows movement in all directions. The rounded end of one bone fits into the hollow space of other bone. For example, joint between upper arm and shoulder.



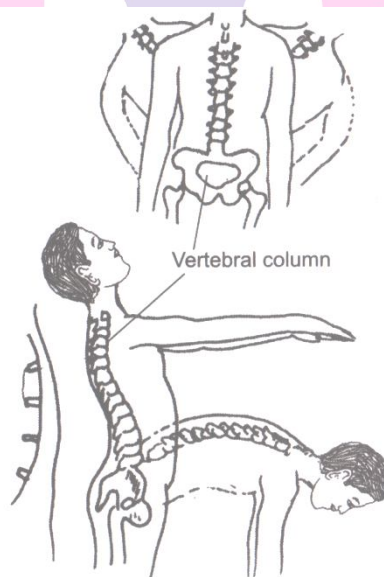
iii. Pivotal joint: This type of joint allow movement in all planes, i.e. up and down, side and other planes. For example, head.



iv. Hinge joint: The joint which allows movement only in one plane is called hinge joint. For example, fingers, knees.



v. Gliding joint: These joints allow only a limited amount of movement of sliding nature of cartilage. For example, the joints of backbone.



**2. What is cartilage? Name an animal whose skeleton is made up of only cartilage and also name two organs of your body made up of cartilage.**

The bone like structure which is soft and elastic in nature and can be bent is called cartilage.

A fish named shark whose body skeleton is made up of only cartilage not bones.

Two organs of our body made up of cartilage are

i. Ear

ii. Nose

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### III. Long Answer Type Questions

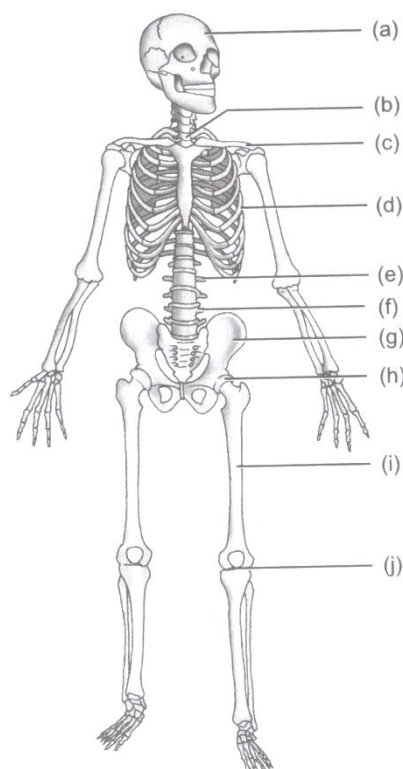
1. Provide one word answers to the statements given below.

[NCERT Exemplar]

- Joint which allows movement in all directions.
- Hard structure that forms the skeleton
- Part of the body with a fixed joint.
- Help in the movement of body by contraction and relaxation.
- Bones that join with chest bone at one end and to the backbone at the other end.
- Framework of bones which gives shape to our body.
- Bones which enclose the organs of our body that lie below the abdomen.
- Joint where our neck joins the head.
- Part of the skeleton that forms the earlobe.

a. Ball and socket joint	b. Bones	c. Upper jaw with skull
d. Muscles	e. Ribs	f. Skeleton
g. Pelvic bones	h. Pivotal	i. Cartilage

2. Given below is the picture of the skeleton. Label the parts marked as a, b, c, d, e, f, g, h, i, j.



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a. Skull	b. Pivot joint
c. Shoulder blade	d. Rib cage
e. Gliding joint	f. Vertebrate
g. Pelvic gridle	h. Ball and socket joint
i. Femur	j. Knee

**3. Distinguish between the following.**

- a. Movement and Locomotion
- b. Tendons and Ligaments
- c. Movable joint and Immovable joint
- d. Ball and socket joint and Hinge joint

a.

S.No	Movement	Locomotion
i.	A change in position and not particularly location	Movement of organisms from place to place.
ii	Occurs in all living organisms	Does not occur in plants.

b.

S.No	Tendons	Ligaments
i.	A tough strand that joins a muscle to a bone is known as a tendon	A muscle strand that holds bones together is known as a ligament.

c.

S.No	Movable joint	Immovable joint
i.	These joints allow movement between bones and have cartilage between them	These joints do not allow movement between bones.
ii	For example, wrist joints	For example, upper jaw joint.

d.

S.No	Ball and Socket joint	Hinge Joint
i.	This joint permits a circular movement	This joint allows movement only in one place.
ii	For example, shoulder joint	For example, elbow joint.

## High Order Thinking Skills (HOTS) Questions

1. Why is the upper part of the human ear not soft as the lower part or the earlobe ?

The upper part of the human ear is made up of cartilage while the earlobe consists of only muscles.

2. Why does an earthworm find it difficult to move on a glass ?

Earthworm fixes its front end and releases the rear end for movement. On a glass, it loses its grip.

## Value Based Questions

1. One day Arun and Raj were playing cricket in a field along with their classmates. Suddenly Raj fell down very badly while he was trying to take a catch. Seeing this Arun ran towards him and found that he was not able to lift his left hand. So Arun immediately cushioned his hand by his sweater and took him to a nearby doctor. After examining Raj, the doctor, told them that Raj had dislocated one of the bones at the joint and had a minor fracture in his left hand. But he consoled them that after proper treatment Raj would get well soon.

- (i) Name the types of joints found in the human body.
- (ii) What values are possessed by Arun ?
- (iii) What values are possessed by the doctor ?

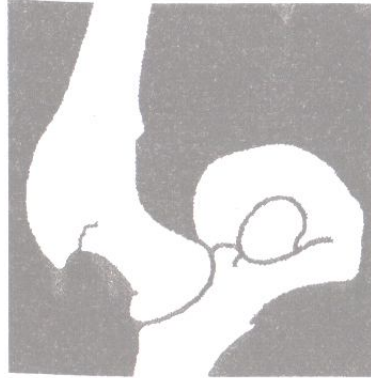
Structural	Functional
Fibrous Joints (fixed) : Bones held together by fibrous connective tissue incl. many collagen fibres. No synovial cavity/fluid.	Immovable Joint : Synar-throsis (singular), Synar-throses (plural).
Cartilaginous Joints (slightly movable) : Bones held together by cartilage. No synovial cavity/fluid.	Slightly movable joint : Amphiarthrosis (singular), Amphiarthroses (plural).
Synovial Joints (incl. freely movable) : Joint in-cludes a synovial cavity containing fluid secreted by synovial membrane. Bones forming the joint surrounded by an articular capsule.	Movable Joint, or Freely movable joint : Diarthro-sis (singular), Diarthroses (plural).

(ii) Value : Caring, loyal towards his friend.

(iii) The doctor has extensive knowledge of bones dislocations and other disorders.

### Skill Based Questions

1. Observe the following figure and identify the type of joint in the figure.



Ball and socket joint.

2. Draw a diagram to show the joint in the hand and answer the following questions.

(i) Can you bend your finger at every joint?

(ii) How many bones does your middle finger have?

(iii) Is your wrist flexible?

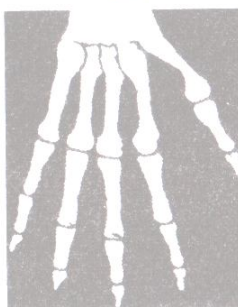
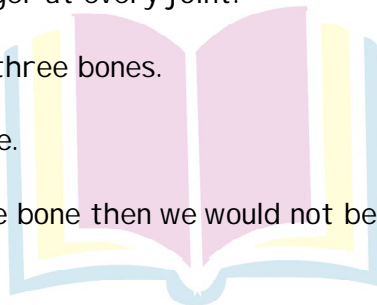
(iv) What will happen if your hand had only one bone?

Ans. (i) Yes, we can bend our finger at every joint.

(ii) Our middle finger have three bones.

(iii) Yes, our wrist is flexible.

(iv) If our hand had only one bone then we would not be able to bend our fingers and other parts of the hand.



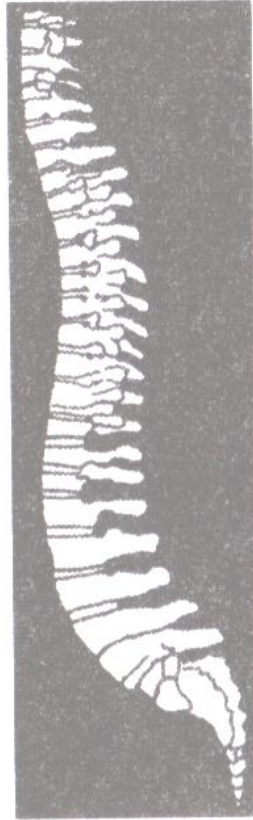
3. Observe the diagram of human backbone and give the answers of following questions.

(i) Does your backbone contain only one bone?

(ii) What would happen if backbone is made up of only one long bone?

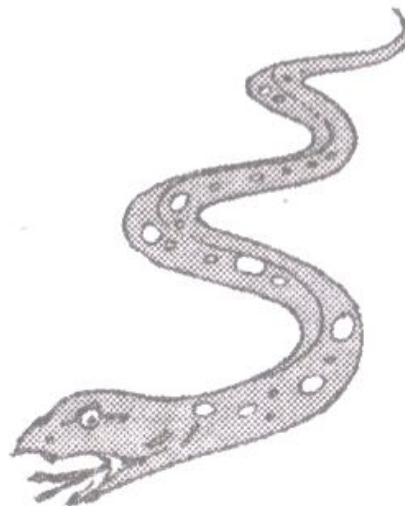
Ans. (i) No, our backbone does not contain only one bone. It is made up of several small bones.

(ii) If backbone had only one bone then we would not be able to bend our back part.

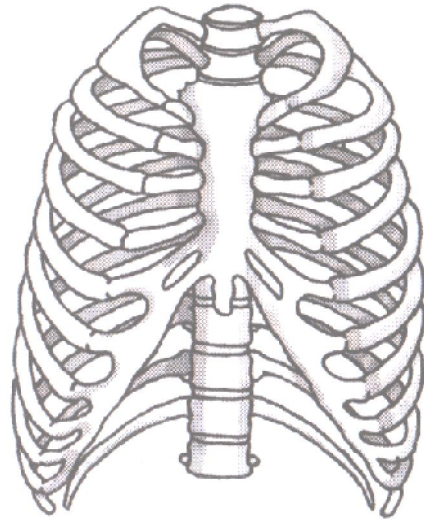


4. Draw a diagram to show the movement in a snake.

Ans.



5. Draw a picture of rib cage.



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