

Support and Movement

Long Answer Questions

Q.1 What do you mean by Support and movement?

Ans. Introduction

Multicellular organisms having greater sizes, need support to keep their body mass as one unit. This is particularly true for those organisms who live on land. In human, skeleton is responsible for support and movement.

(I) Movement: Movement is a general term meaning the act of changing place or position by entire body or by its parts. There are two types of movements:

- 1) Movement of body parts
- 2) Locomotion

(II) Locomotion: Locomotion is the movement of an animal as a whole from one place to another.

Q.2 Define human skeleton. Describe its types and role.

Ans: Skeleton

Skeletal system or skeleton is defined as the framework of hard articulated structures that provide physical support, attachment for skeletal muscles and protection for bodies of animals.

Types of skeleton

It is of two types:

- (i) Endoskeleton:** The skeleton which is present on inside the body is called endoskeleton. e.g. in Vertebrates and Human.
- (ii) Exoskeleton:** The skeleton which is present outside of the body e.g. in arthropods.

Parts of Skeleton: There are two parts of skeleton:

- 1) Cartilage
- 2) Bones

In the living body, skeleton is very much alive. Bones and cartilage are made up of living cells having nerves and blood vessels in them. They grow and have the ability to repair themselves.

Role of Skeleton system: Skeletal system provides:

- 1) Movements
- 2) Protection
- 3) Support

1-Movements: Skeleton works very closely with the muscular system to help the body for movement.

2-Protection: Skeleton provides protection to many of our internal organs e.g. skull protects brain, vertebral column protects spinal cord and ribs protect many organs especially heart and lungs.

3- Support: Skeleton provides support to our body mass e.g. vertebral column provides main support to our body mass.

Q.3 Write a note on cartilage and bone in Human skeleton?

Ans. Introduction

Overall, the human skeleton is made of bony framework but in certain parts, this frame work is supplemented by cartilage.

Connective Tissue

Both cartilage and bones are types of connective tissues in animals. Most of the connective tissues contain collagen fibres in a matrix.

Explanation

(i) Cartilage

Definition

Cartilage is a dense, clear blue-white firm connective tissue but less strong than bone.

Chondrocytes

The cells of cartilage are called chondrocytes.

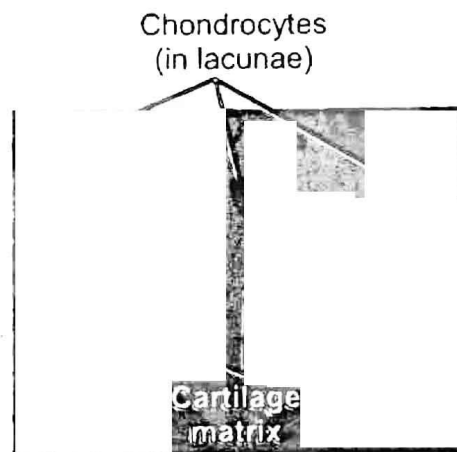


Figure 13.1: Chondrocytes in cartilage matrix

Lacuna

Each chondrocyte lies in a fluid space called lacuna present in the matrix of cartilage.

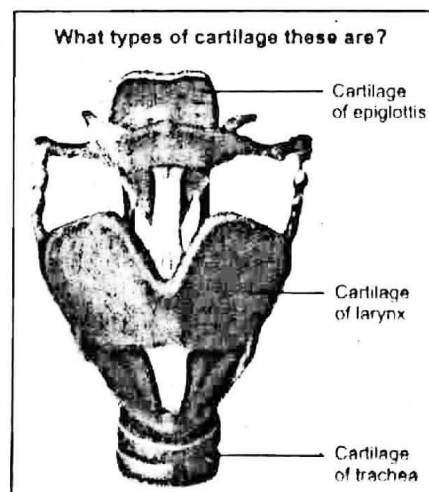
Collagen Fibres

The matrix of cartilage also contains collagen fibres.

No Blood vessels in cartilage

Blood vessels do not enter cartilage.

Types of Cartilage (Board 2014)



There are three types of cartilage:

1. Hyaline cartilage
2. Elastic Cartilage
3. Fibrous cartilage

1) **Hyaline Cartilage:** Hyaline cartilage is strong and flexible cartilage. It is found covering the ends of the long bones, in the nose, larynx, trachea and bronchial tubes.

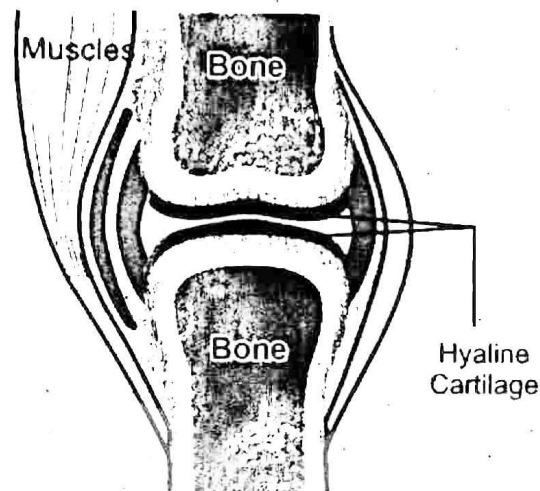


Figure 13.2: Hyaline cartilage

- 2) **Elastic Cartilage:** Elastic cartilage is similar to hyaline cartilage. It is also quite strong but has elasticity due to a network of elastic fibers in addition to collagen fibers. It is found in epiglottis and pinna etc.
- 3) **Fibrous Cartilage:** Fibrous cartilage is very tough and less flexible due to large number of their collagen fibers present in knitted form. It is found in intervertebral discs.

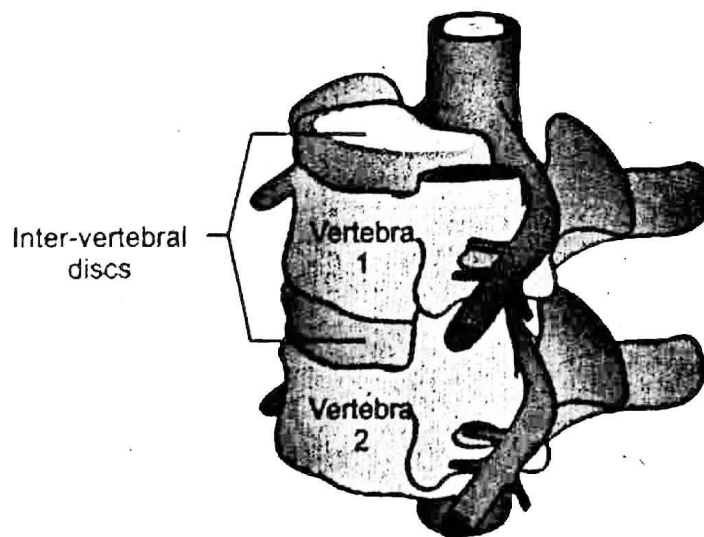


Figure 13.3: Fibrous cartilage

(ii) Bone:

Definition

Bone is the hardest connective tissue in body. Bones not only move, support and protect the various parts of body but also produce red and white blood cells and store minerals.

Structure of a bone

- 1) **Compact bone** The hard outer layer of a bone is called compact bone.
- 2) **Spongy bone** Interior of bone is soft and porous called spongy bone, it contains blood vessels and bone marrow. Babies are born with about 300 soft bones some of these bones later fuse together, so that the adult skeleton has 206 hard bones.

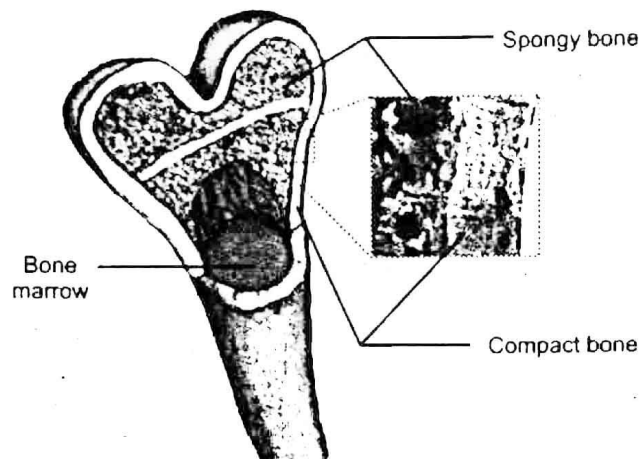


Figure 13.4: compact and spongy bone

- 3) **Matrix of bones** Like cartilage, the matrix of bones also contains collagen. But it also contains minerals e.g. calcium and phosphate. Bones contain different types of cells.

4) Osteocyte

Mature bone cells are called osteocytes.

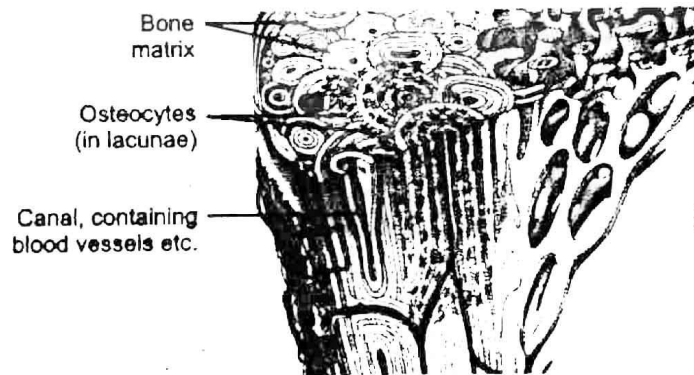


Figure 13.5: The internal structure of bone

Q.4 What are the components of human skeleton?

Ans. Introduction

206 bones are present in the adult human skeleton. Skeleton can divide into two parts:

1. **Axial Skeleton** Bones are organized into a longitudinal axis i.e. axial skeleton. Axial Skeleton consists of 80 bones in the head and trunk of body.

Parts

It is composed of five parts:

- i. **Skull** Contains 22 bones out of which 8 are cranial bones (enclosing the brain) and 14 are facial bones.
- ii. **Middle ear ossicles** 6 bones are present in middle ear (3 in each ear).
- iii. **Hyoid bone** It is present in neck.
- iv. **Vertebral column** It contains 33 bones and these bones are called vertebrae.
- v. **Chest** Chest is made up of a chest bone called sternum and ribs. 24 ribs are present in 12 pairs.

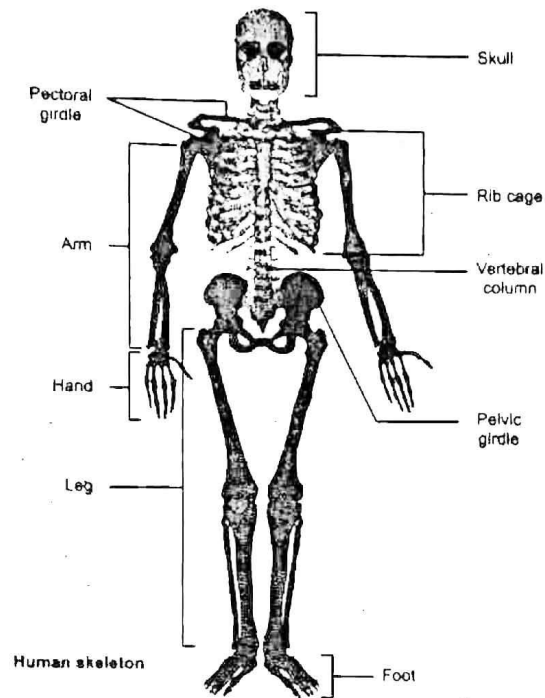


Figure 13.6: Human Skeleton

2. Appendicular skeleton:

Appendicular skeleton is attached to the axial skeleton. Appendicular skeleton is composed of 126 bones.

Parts

It is divided into two parts.

- 1) **Pectoral Girdle (Shoulders):** It is called shoulder girdle and made up of 4 bones. Arms have six bones. Both hands have 54 bones.
- 2) **Pelvic Girdle (hips):** It has two bones. Legs have 6 bones and feet have 54 bones.

Q.5 Define Joint and write down the types of Joints.

(Board 2014)

Ans. Joints: A joint is a location at which two or more bones make contact. Joints allow movement and provide mechanical support.

Types of joints: Joints can be classified on the basis of degree of movement they allow.

- 1) Immoveable joints (Fixed)
- 2) Slightly moveable joints
- 3) Moveable joints

1. **Immoveable joints:** Such joints allow no movement e.g. the joints between the skull bones.
2. **Slightly moveable joints:** Such joints allow slight or little movements e.g. joints between the vertebrae.

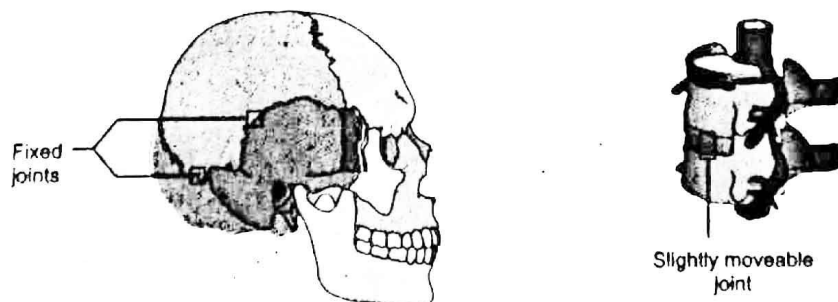


Figure 13.7: Fixed and slightly moveable joints

3. **Moveable joints:** They show a variety of movements e.g. shoulder joint, hip joint, elbow joint, knee joint etc.

Types of Moveable Joints

There are many types of moveable joints:

1) Hinge joint

2) Ball and socket joint

1. **Hinge joints:** Hinge joint move back and forth like the hinge on a door and allow movements in one plane only. The knee and elbow are hinge joints.

2. **Ball and socket joints:** These joints allow movement in all directions. The hip and shoulder joints are ball and socket joints.

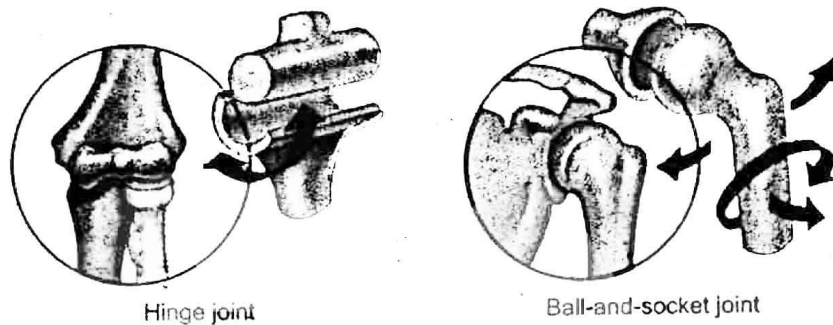


Figure 13.8: Two types of Moveable Joints

Q.6 Describe the role of tendons and ligaments.

Ans Introduction

Tendons and ligaments are bands of connective tissue (made of collagen).

Tendons

Tendons are bands of connective tissues in which collagen fibers are tightly packed. These are tough bands which attach muscles to bones. When muscle contracts, tendon exerts a pulling force on the attached bone, which moves as a result.

Ligaments

Ligaments are also the bands of connective tissues having highly packed collagen fiber. Ligaments are strong but flexible bands and join one bone to another at joints.

Function

They prevent dislocation of bones at joints.

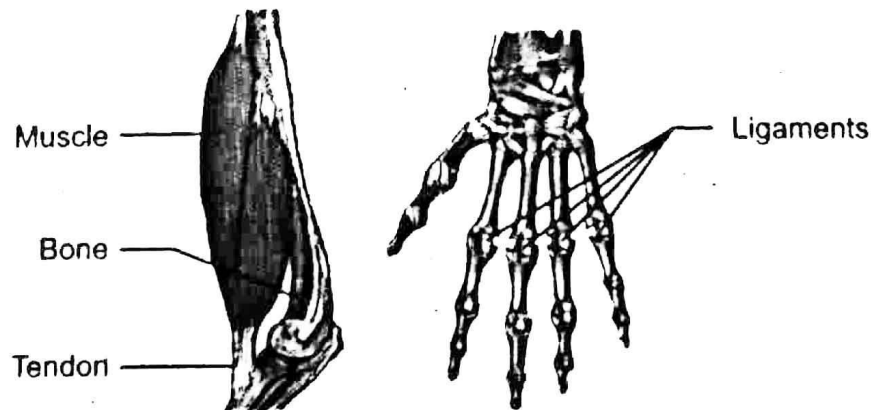


Figure 13.9: Tendons and Ligaments

Q.7 How skeletal muscles, are involved in the movement of the skeleton?

Ans. When bones move at joints, they produce movement. The movements in bones are brought about by the contractions of skeletal muscles, which are attached with bone by tendons. The combination of several muscles bring about activities e.g. walking, running, playing etc.

Origin: One end of skeletal muscle is always attached with some immovable bone. This end of muscle is called origin.

Insertion: Other end of muscle is attached with a moveable bone and is called insertion.

Muscles can only contract or pull but cannot expand or push the bones. When muscle is stimulated by a nerve impulse, it contracts to become shorter and thicker. Due to this contraction, muscle pulls the moveable bone at insertion.

Role of Skeletal Muscles

(a) Antagonism: Skeletal muscles are usually in pairs of antagonists. In an antagonistic pair, both muscles do opposite jobs. When one muscle contracts the other relaxes and this phenomenon is called antagonism or antagonistic action.

(b) Flexor: When a muscle in an antagonistic pair contracts and bends the joints, it is called flexor muscle and movement is called flexion.

(c) Extensor: When a muscle contracts and straightens the joint, it is known as extensor and the movement is called extension.

Example: (Movement of arm)

(a) Antagonistic Pair

Bicep and triceps are antagonistic pair of muscles and are involved in the movement of arm.

(b) Biceps

Biceps is a flexor muscle in front of the upper arm bone.

(c) Triceps

Triceps is an extensor muscle on the back of arm. Both of these muscles have their origin at pectoral girdle and insertion at one of the two bones of forearm.

(d) Working

When biceps contracts, the forearm (insertion end) is pulled upward. It is flexion of elbow joint. During this flexion, triceps muscle relaxes. When triceps contracts, forearm is pulled down. It is an extension at elbow joint. During it, biceps relaxes. Similar pairs, working antagonistically across other joints, provide for almost all the movements of skeleton.

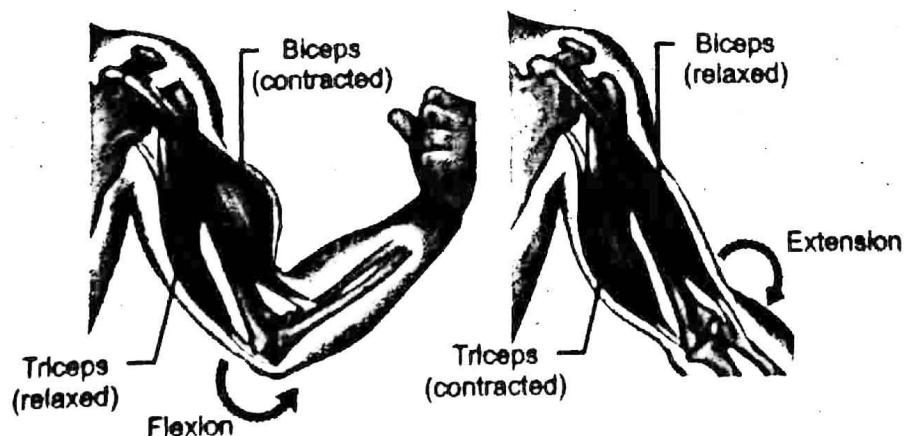


Figure 13.10: Action of Antagonistic Muscles (Biceps and Triceps) at Elbow

Q.8 Write a note on disorders of skeletal system?

Ans. The following are the disorders of skeletal system:

1. Osteoporosis: In Osteoporosis, there is a decrease in the density of bones due to the loss of calcium and phosphorus. It is a bone disease in adults especially in old people. It is more common in old women. In women, estrogen deposits minerals in bones. When reproductive cycle stops in female, not enough estrogen is secreted and no minerals are deposited at bones and women becomes victim of osteoporosis.

Causes:

- i. Malnutrition (lack of protein and Vitamin C)
- ii. Lack of physical activities
- iii. Deficiency of estrogen hormone in women
- iv. Decrease in the secretion of growth hormones in old age and it also leads to decreased deposition of minerals in bone matrix.

2. Arthritis

Introduction: Arthritis means “inflammation in joints”. It is also very common in old age and in women.

Symptoms

It is characterized by pain and stiffness in joints particularly in the weight bearing joints e.g; in hip joint and ankle joint etc.

Treatment

It includes pain killer and anti-inflammatory medicines.

Types of Arthritis:

1) Osteoarthritis

It is due to the degeneration in the cartilage present at joints or due to decreased lubricant production at joints. In this arthritis, fusion of the bones at joint may occur and joints may become totally immovable.

2) Rheumatoid arthritis

It involves the inflammation of the membranes at joints. Its symptoms include fatigue, low grade fever, pain and stiffness in joints.

3) Gout: It is characterized by the accumulation of uric acid crystals in moveable joints. It generally attacks the toe joints.

Multiple Choice Questions

1. Find the ball-and-socket joint;
 - (a) Joint in the finger bones
 - (b) Joint of neck and skull bones
 - (c) Joint at elbow
 - ☒ (d) Joint at pelvic girdle and leg bones
2. All these are the parts of axial skeleton of humans except:
 - (a) Ribs
 - (b) Sternum
 - ☒ (c) Shoulder girdle
 - (d) Vertebral column
3. The disorders in which there is an accumulation of uric acid in joints:
 - ☒ (a) Gout
 - (b) Rheumatoid arthritis
 - (c) Osteoporosis
 - (d) Osteoarthritis
4. What is correct about tendons?
 - ☒ (a) Tendons are flexible and they join muscles with bones
 - (b) Tendons are non-elastic and they join bones with bones
 - ☒ (c) Tendons are non-elastic and they join muscles with bones
 - (d) Tendons are flexible and they join muscles with muscles
- How many bones make our skull?

(a) 14	☒ (b) 22 (B-13)
(c) 24	(d) 26
- What are the main components of a bone?
 - (a) Marrow, spongy bone, wax
 - (b) Marrow, compact bone, wax
 - (c) Compact bone and marrow
 - ☒ (d) Compact bone, spongy bone, marrow
- What do some bones produce?
 - (a) mucous
 - (b) hormones
 - (c) oxygen
 - ☒ (d) blood cells
8. How would you define skeletal system?
 - (a) All the bones in body
 - (b) All the muscles and tendons
 - (c) All the body's organs, both soft and hard tissues.
 - ☒ (d) All the bones in body and the tissues that connect them
9. Find the INCORRECT statement:
 - (a) Bone is where most blood cells are made
 - (b) Bone serves as a storehouse for various minerals
 - ☒ (c) Bone is a dry and non-living supporting structure
 - (d) Bone protects and supports the body and its organs
10. The purpose of rib cage is to:
 - (a) Protect the stomach
 - (b) Protect the spinal cord
 - ☒ (c) Protect the heart and lungs
 - (d) Provide an object to which the lungs can attach
11. There are ____ types of joints.

(a) 2	☒ (b) 3
(c) 4	(d) 5
12. The skeletal system outside the body is called;
 - (a) endoskeleton
 - ☒ (b) exoskeleton
 - (c) normal skeleton
 - (d) Exoskeleton & Endoskeleton
13. In our body skeleton works very closely with the ____ system.
 - ☒ (a) Muscular
 - (b) Nervous
 - (c) Endocrine
 - (d) All of these
14. Babies are born with about ____ soft bones.

(a) 206	(b) 250
☒ (c) 300	(d) 350

15. Vesalius was born in;
☒ (a) Brussels (b) London
 (c) Birmingham (d) Sidney
16. _____ is the longest bone in our body.
 (a) Arm (b) Leg
☒ (c) Thigh (d) Foot
17. _____ is the smallest bone in our body
 (a) Thigh (b) ☒ Stapes
 (c) Ankle (d) Knee-cap
18. Which joints allow no movement?
 (a) Moveable joints
 (b) Slightly moveable joints
☒ (c) Immoveable joints
 (d) None of these
19. Muscles can only;
☒ (a) Contract (b) Push
 (c) Expand (d) All of above
20. Pair of skeletal muscles are called:
 (a) Extensor (b) Flexor
☒ (c) Antagonistic (d) None of these
21. When a muscle contracts, the point of attachment which is pulled is called
 (a) Origin (b) ☒ Insertion
 (c) Origin and Insertion (d) None
22. When the reproductive cycle stops in female, _____ hormone is less produced.
 (a) Androgen (b) ☒ Esterogen
 (c) Insulin (d) none of these
23. In gout _____ is accumulated in immoveable joints.
 (a) Glucose (b) urea
☒ (c) Uric acid (d) Ammonia
24. Inflammation of membrane at joints is called;
 (a) Osteoarthritis
☒ (b) Rheumatoid arthritis
 (c) Arthritis
 (d) Gout
25. _____ joint move only in one plane.
 (a) Ball & socket
☒ (b) Hinge joint
 (c) Moveable joint
 (d) Slightly moveable joints
26. _____ prevents dislocation of bones at joints.
☒ (a) Ligament (b) Tendons
 (c) Salts (d) Joint
27. Bone can store;
 (a) Urea (b) Salts
 (c) Uric acid (d) ☒ Minerals
28. Cranial bones are;
 (a) 8 (b) 10
 (c) 12 (d) ☒ 22
29. Bones which enclose brain are called;
☒ (a) Cranial bones (b) Cervical bones
 (c) Vertebrae (d) None of above
30. Lacuna is present in the _____ of cartilage.
 (a) Bone (b) ☒ Matrix
 (c) Collagen (d) Cartilage
31. Disease of bones in which there is a decrease in the density of the bones due to loss of calcium and phosphorus is: (Board 2013)
☒ (a) Osteoporosis
 (b) Osteoarthritis
 (c) Rheumatoid arthritis
 (d) Gout
32. Which allows movement in all directions:
 (a) Shoulder & Knee Joints
 (b) Hip & Elbow Joints
☒ (c) Hip & Shoulder Joints
 (d) Elbow & Knees Joints
33. The bending of arm at elbow is:
 (a) Relaxation (b) Contraction
☒ (c) Flexion (d) Extension

34. Vertebral Column consists of following number of bones:
 (a) 10 (b) 20
 (c) 23 (d) 33
35. Which one cannot show movement from one place to an other place?
 (a) Bacteria (b) Animals
 (c) Plants (d) Human beings
36. Place where two or more bones meet at a point is called
 (a) Origin (b) Joint
 (c) Insertion (d) Tendons
37. The muscle of the arm at elbow joint causes straightening of the arm, it is called:
 (a) Extension (b) Extensor
 (c) Flexion (d) Flexor
38. Fore limbs are the part of:
 (a) Appendicular skeleton
 (b) Axial skeleton
 (c) Exoskeleton
 (d) Exoskeleton and Endoskeleton
39. Osteoporosis is due to deficiency of
 (a) Carbon (b) Nitrogen
 (c) Calcium (d) Phosphorus
40. The example of slightly moveable joint is:
 (a) Joint of elbow
 (b) Joint of knee
 (c) Joint of shoulder
 (d) Joints of vertebral column
41. Pain and stiffness in weight bearing joints are symptoms of:
 (a) Arthritis
 (b) Gout
 (c) Rheumatoid arthritis
 (d) Osteoporosis
42. How many bones are present in right hand?
 (a) 56 (b) 43
 (c) 28 (d) 27
43. Which of the following provides main support to our body mass?
 (a) Skull
 (b) Body
 (c) Vertebral column
 (d) Spinal cord
44. How many bones are present in middle ear?
 (a) 2 (b) 3
 (c) 5 (d) 6
45. Fatigue, low grade fever, pain and stiffness in joints are symptoms of:
 (a) Arthritis
 (b) Osteoarthritis
 (c) Gout
 (d) Rheumatoid Arthritis
46. Blood vessels do not enter:
 (a) Bone (b) Matrix
 (c) Cartilage (d) Lacuna
47. Fibrous cartilage is present in:
 (a) Pinna
 (b) Nose
 (c) Intervertebral discs
 (d) Epiglottis
48. How many ribs are there in man?
 (a) 22 (b) 12
 (c) 24 (d) 33
49. Movement of an animal as a whole is:
 (a) stimulus (b) response
 (c) locomotion (d) movement
50. Mark the False statement about bones:
 (a) Contain chondrocytes
 (b) Ability to store minerals
 (c) Contains blood vessels
 (d) Hardest connective tissue
51. Which of the following stores minerals?
 (a) Bone (b) Cartilage
 (c) Cartilage and bone (d) Joints
52. Pelvic Girdle contains bones:
 (a) 33 (b) 02
 (c) 54 (d) 12

55. An example of ball and socket joint is:

- (Board 2014)

54. Deposition of uric acid in joints is due to: (Board 2014)

- (a) Osteoarthritis
(b) Gout
(c) Osteoporosis
(d) Rheumatoid Arthritis

1	d	2	c	3	a	4	c	5	b	6	d
7	d	8	d	9	c	10	c	11	b	12	b
13	a	14	c	15	a	16	c	17	b	18	c
19	a	20	c	21	b	22	b	23	c	24	b
25	b	26	a	27	d	28	a	29	a	30	b
31	a	32	c	33	c	34	d	35	c	36	b
37	b	38	a	39	c	40	d	41	a	42	d
43	c	44	b	45	d	46	c	47	c	48	c
49	c	50	a	51	a	52	b	53	c	54	b
55	b										

Short Answer Questions

Q.1 Write the two characteristics of animals?

Ans. Movement and locomotion are the characteristics of animals.

Q.2 What do you mean by movement?

Ans. Movement is a general term meaning, the act of changing place or position by entire body or by its parts.

Q.3 How many types of movement are?

Ans. There are two types of movement:

- i. Movements of body parts
- ii. Locomotion

Q.4 What do you mean by locomotion?

Ans. Locomotion is the movement of an animal as a whole from one place to another.

Q.5 What is sternum?

Ans. Chest bone is called sternum.

Q.6 What do you know about osteoarthritis? (Board 2013)

Ans. It is due to degeneration in cartilage present at joints or due to decrease in lubricant production at joints. In this arthritis, fusion of the bones at joint may occur and joints may become totally immovable.

Q.7 What is Rheumatoid arthritis? Or Write down causes of Rheumatoid Arthritis, also give its two symptoms. (Board 2014)

Ans. It involves the inflammation of the membranes at joints. Its symptoms are fatigue, low grade fever, pain and stiffness of joints.

Q.8 What do you mean by "Exoskeleton"?

Ans. The skeleton system of some invertebrates e.g. arthropods are at the outside of the body, and are called exoskeleton.

Q.9 What is skeleton? Define briefly.

Ans. Skeleton system or skeleton is defined as the framework of hard, articulated structure that provides physical support, attachment for skeletal muscles and protection for the bodies of animals.

Q.10 What do you mean by endoskeleton?

Ans. Like other vertebrates, the human skeleton is on the inside of body and is called endoskeleton.

Q.11 What is the role of skeletal system?

Ans. The big functions of skeletal system are protection, support and movement of a body. Skeleton works very closely with the muscular system to help us in movement. Similarly skeleton also provides protection to many internal organs e.g. skull protects brain and vertebral column. It also provides the main support to our body mass.

Q.12 What do you know about bone and cartilage?

Ans. Bone and cartilage are types of connective tissues in animals. Most connective tissue contains collagen fibers in a matrix. Cartilage is dense clear firm connective tissue while bone is hardest connective tissues.

Q.13 Define cartilage. Write names of its two types. (Board 2014)

Ans. Definition:

Cartilage is a dense, clear blue-white firm connective tissue (but less strong than bone).

Names of two types:

1. Hyaline Cartilage
2. Elastic Cartilage

Q.14 What are the cells of cartilage called?

Ans. The cells of cartilage are called chondrocytes.

Q.15 Where the chondrocyte lies?

Ans. Each chondrocyte lies in a fluid space called lacuna, present in the matrix of cartilage.

Q.16 How many types of cartilage are there?

Ans. There are three types of cartilage:

- i. Hyaline cartilage
- ii. Elastic cartilage
- iii. Fibrous cartilage

Q.17 What are tendons and ligaments?

Ans. Tendons and ligaments are connective tissues that contain tightly packed collagen fibers. Tendons are tough bands and attach muscles to bones. Ligaments are flexible bands and join one bone to another at joints.

Q.18 What do you know about Hyaline cartilage?

Ans. Hyaline cartilage is a strong yet flexible. It is found covering the ends of the long bones, in the nose, larynx, trachea and bronchial tubes.

Q.19 What is Elastic cartilage?

Ans. Elastic cartilage is similar in structure to hyaline cartilage. It is also quite strong but has elasticity due to a network of elastic fibers in addition to collagen fibers. It is found in epiglottis, pinna etc.

Q.20 What is fibrous cartilage?

Ans. Fibrous cartilage is very tough and less flexible due to large number of thick collagen fibers present in knitted form. It is found in intervertebral discs.

Q.21 What is a Bone? (Board 2013)

Ans. Bone is a hardest connective tissue in body.

Working

Bones not only move, support and protect the various parts of body but also produce red and white blood cells and store minerals.

Q.22 What are compact bones and spongy bones?

Ans. The hard outer layer of a bone is called compact bone while the interior of bone is soft and porous called spongy bone.

Q.23 What matter does bone contain?

Ans. Spongy bone contains blood vessels and bone marrow. Matrix of bones contain collagen, calcium and phosphate. Bone also contain different types of cells.

Q.24 With how many bones babies are born.

Ans. Babies are born with about 300 soft bones. Some of these bones later fuse together, so the adult skeleton has 206 hard bones.

Q.25 What are mature bone cells called?

Ans. The mature bone cells are called osteocytes.

Q.26 Who was Andreas Vesalius? What do you know about him?

Ans. Andreas Vesalius is honoured for developing modern anatomical studies. He was born in Brussels, Belgium. He made many discoveries in anatomy based on studies made by dissection of human dead bodies. His book contained the most accurate depictions of the whole skeleton and muscles of the human body.

Q.27 What are the components of human skeleton?

Ans. The 206 bones in the adult human skeleton are organized into a longitudinal axis i.e. axial skeleton, to which appendicular skeleton is attached.

Q.28 How many bones are present in axial skeleton? Give detail.

Ans. Axial skeleton consists of the 80 bones in the head and trunk of body. It is composed of five parts:-

- i. Skull contains 22 bones out of which 8 are cranial bones (enclosing the brain) and 14 are facial bones.
- ii. There are 6 middle ear ossicles (3 in each ear).
- iii. There is also a hyoid bone in neck.
- iv. Vertebral column contains 33 bones (vertebrae).
- v. The chest is made of a chest bone called sternum and 24 (12 pairs) ribs.

Q.29 How many bones are there in appendicular skeleton?

- i. Appendicular skeleton is composed of 126 bones.
- ii. Pectoral (shoulder) girdle is made of 4 bones.
- iii. Arms have six (06) bones.
- iv. Both hands have 54 bones.
- v. Pelvic girdle (hips) has 2 bones.
- vi. Legs have 06 bones.
- vii. Both feet have 54 bones.

Q.30 Describe upper and lower jaw in mammals and vertebrates?

Ans. The upper jaw is fixed with skull and is composed of two bones. The lower jaw is mobile and articulates with the skull. In lower vertebrates, the lower jaw is made up of more than one bone while in mammals it is made of single bone.

Q.31 How mammals improve hearing?

Ans. During evolution, mammals modified the lower jaw bones and incorporated four of them into the middle ear (in the form of malleus and incus in both ears). This adaptation proved beneficial for mammals. Lower jaw with single bone is stronger and the malleus and incus also improve hearing.

Q.32 What is a joint?

Ans. A joint is the location at which two or more bones make contact. They allow movement and provide mechanical support.

Q.33 At which basis, joints can be classified?

Ans. Joints can be classified on the basis of degree of movement they allow.

Q.34 What do you know about immovable or fixed joints?

(Board 2013)

Ans. Such joints allow no movements e.g. the joint between the skull bones.

Q.35 What do you know about slightly moveable joints?

Ans. Such joints allow slight movements e.g. joints between the vertebrae.

Q.36 What do you know about moveable joints?

(Board 2013)

Ans. They allow a variety of movements e.g. shoulder joint, hip joint, elbow joint, knee joint etc.

Q.37 What are the main types of moveable joints?

Ans. The main types of moveable joints are:

- (i) Hinge joints
- (ii) Ball-and-socket joints

Q.38 Define Hinge joints and give one example. (Board 2014)

Ans. Hinge joints move back and forth like the hinge on a door and allow movements in one plane only.

Example

The knee and elbow are hinge joints.

Q.39 What are ball-and-socket joints?

Ans. Ball and socket joints allow movement in all directions.

Example:

Hip and Shoulder joints.

Q.40 What would have happened if neck joint were a ball-and-socket joint?

Ans. Then we can move freely our neck in all directions.

Q.41 What is the role of tendons and Ligaments tissues?

Ans. Role of Tendons

Tendons are tough bands and attach muscles to bones. When a muscle contracts, tendon exerts a pulling force on the attached bone, which moves as a result.

Role of Ligaments

Ligaments are strong but flexible bands and join one bone to another at joints. They prevent dislocation of bones at joints.

Q.42 Differentiate between origin and insertion of a skeletal muscle. (Board 2014)

Ans. Origin

One end of a skeletal muscle is always attached with some immovable bone. This end of muscle is called as origin.

Insertion

The other end of muscle which is attached with a moveable bone is called as insertion.

Q.43 What do you know about "Antagonists"?

Ans. Skeletal muscles are usually in pairs of antagonists. In an antagonistic pair, both muscles do opposite jobs.

Q.44 What is meant by antagonism?

(Board 2013)

Ans. When one muscle contracts, the other relaxes and this phenomenon is known as antagonism.

Q.45 What is meant by "Flexor" muscle and Flexion?

Ans. When a muscle contracts and bends a joint, it is known as flexor muscle and the movement is called as flexion. Biceps is an example of flexor muscle.

Q.46 What is meant by extensor muscle and extension?

Ans. When a muscle contracts and straightens the joint, it is known as extensor muscle and the movement is called extension.

Example

Triceps is an example of the extensor muscle.

Q.47 Which point of attachment is pulled when a muscle contracts?

Ans. When muscle contracts, it pulls the moveable bone (at insertion).

Q.48 Describe briefly about osteoporosis? (Board 2013)

Ans. Osteoporosis is a disorder of skeletal system. It is a bone disease in adults, especially in old people. It is more common in old women. In osteoporosis, there is a decrease in the density of bones due to loss of calcium and phosphorus.

Q.49 What is a function of estrogen?

Ans. The function of estrogen is to deposit minerals in bones. When the reproductive cycle stops in females, not enough estrogen is secreted.

Q.50 Describe Arthritis. Write the names of its types.

Ans. Arthritis means "inflammation in joints". It is also very common in old age and in women.

Symptoms

Pain and stiffness in joints particularly in the weight bearing joints e.g. hip and ankle joints.

Treatment

Pain killer and anti-inflammatory medicines are supposed to decrease the symptoms.

Types

i. Osteo-arthritis ii. Rheumatoid arthritis iii. Gout

Q. 51 Differentiate between cartilage and bone? (Board, 2013)

Ans. Cartilage is a dense clear, blue.white, firm connective tissues. It is found covering important body parts. e.g., nose, epiglottis, trachea etc. Bones are the hard connective tissue providing movement, support and protection to various body parts.

Q. 52 What is the role of skeleton in support and movement?

Ans. Skeleton provides protection to internal organs e.g. skull protects brain and support to body mass and can move the body by muscles.

Q.53 What are biceps and triceps?

Ans: Biceps is a flexor muscle on the front of the upper arm bone while Triceps is an extensor muscle on the back of arm.

Q.54 What is chondrocyte?

Ans: The cells of cartilage are called chondrocyte.

Q.55 What are cranial bones?

Ans: The bones which enclose the brain are called cranial bones. They are eight in number.

Q.56 What is Gout?

Ans: It is characterized by the accumulation of uric acid crystals in moveable joints. It generally attacks the toe joints.

Q.57 Define Lacuna?

Ans. Cells of cartilage (chondrocytes) lie in a fluid space called lacuna.

Q.58 Define Osteocytes.

Ans. The mature bone cells are called osteocytes.

Q.59 Write down two disorders along with one reason of each of human skeletal. (Board 2014)

Ans. The disorders of human skeletal system are:

1. Osteoporosis:

It is a bone disease. In it, there is a decrease in the density of bones due to loss of calcium and phosphorus.

2. Osteoarthritis:

It is due to degeneration in the cartilage present at joints or due to decreased lubricant production at joints.