

Chapter: 13

Support and Movement

Objective

- What do some bones produce?
☒ (A) Blood cells ☐ (B) Oxygen ☐ (C) Mucous ☐ (D) Hormones
- Number of bones in upper jaw is:
☐ (A) Fourteen ☒ (B) Two ☐ (C) Three ☐ (D) Ten
- The cartilage found in intervertebral discs is:
☐ (A) Elastic ☐ (B) Matrix ☒ (C) Fibrous ☐ (D) Hyaline
- Which one of the following have exoskeleton:
☐ (A) Reptiles ☐ (B) Mammals ☐ (C) birds ☒ (D) Arthropods
- Gout is due to accumulation of:
☐ (A) Lactic acid ☐ (B) Formic acid ☒ (C) Uric Acid ☐ (D) Nitric
- Outer hard layer of bone is called:
☐ (A) Osteocyte ☒ (B) Compact Bone ☐ (C) Cartilage ☐ (D) Spongy Bone
- Which bone is part of Appendicular Skelton?
☒ (A) Pectoral shoulder girdle ☐ (B) sternum
☐ (C) vertebral column ☐ (D) Skull
- The cells of cartilage are called:
☐ (A) Collagen ☒ (B) Chondrocytes ☐ (C) Osteoblast ☐ (D) Osteocytes
- The biggest bone of our body is found in:
☐ (A) hand ☐ (B) waist ☒ (C) leg ☐ (D) thigh
- Babies are born with soft bones:
☐ (A) 256 ☐ (B) 206 ☐ (C) 200 ☒ (D) 300
- Number of bones in both hand is:
☐ (A) 90 ☐ (B) 126 ☒ (C) 54 ☐ (D) 33
- Which bones enclose the brain?
☐ (A) Ribs ☒ (B) Cranial bones ☐ (C) Pectoral girdle ☐ (D) Pelvic girdle
- The purpose of rib cage is to:
☒ (A) Protect the heart and lungs ☐ (B) Provide an object to which the lungs can attach
☐ (C) Protect the spinal cord ☐ (D) Protect the stomach
- Number of cranial bones in human skeleton is:
☐ (A) 16 ☒ (B) 8 ☐ (C) 33 ☐ (D) 22
- The interior of bone is soft and porous which is called:
☐ (A) cartilage ☐ (B) bone marrow ☒ (C) spongy bone ☐ (D) Compact bone
- An adult person skeleton has hard bones:
☐ (A) 106 ☐ (B) 306 ☐ (C) 406 ☒ (D) 206
- Generally gout attacks the joints?
☐ (A) Hinge joints ☐ (B) Ankle joints ☒ (C) Toe joints ☐ (D) Hip joints

18. animals have exoskeleton.

- ☐ (A) reptiles ☒ (B) arthropods ☐ (C) birds ☐ (D) mammals

19. Elastic cartilage is found in:

- ☒ (A) In Epiglottis ☐ (B) In Bronchial tubes ☐ (C) in Trachea ☐ (D) In Larynx

20. The bones in pelvic or hip girdle are:

- ☐ (A) 6 ☒ (B) 2 ☐ (C) 4 ☐ (D) 5

21. The cartilage found in intervertebral discs is:

- ☐ (A) Elastic ☐ (B) Matrix ☒ (C) Fibrous ☐ (D) Hyaline

22. Number of bones in both feet is:

- ☐ (A) 22 ☐ (B) 108 ☐ (C) 126 ☒ (D) 54

23. Cartilage and bone are types of tissues of animals.

- ☐ (A) Cardiac ☐ (B) Smooth ☒ (C) Connective ☐ (D) Muscle

24. Which cartilage is found in epiglottis and pinna:

- ☐ (A) Fibrous ☒ (B) Elastic ☐ (C) Collagen ☐ (D) Hyaline

25. Number of facial bones is:

- ☒ (A) 14 ☐ (B) 26 ☐ (C) 24 ☐ (D) 22

26. In Mammals the no. of bones in lower Jaw are:

- ☐ (A) Only Two ☒ (B) Only One ☐ (C) 3 ☐ (D) 4

27. Number of bones in Appendicular skeleton is:

- ☐ (A) 108 ☐ (B) 56 ☒ (C) 126 ☐ (D) 120

28. Vertebral column protects:

- ☐ (A) Brain ☐ (B) Lungs ☐ (C) Heart ☒ (D) Spinal cord

29. Osteoporosis is a disease of:

- ☐ (A) heart ☐ (B) brain ☒ (C) bones ☐ (D) stomach

30. The part of bone in which blood vessels are found:

- ☐ (A) Bone marrow ☒ (B) Spongy bone ☐ (C) Compact bone ☐ (D) None of these

31. An example of immovable joints:

- ☒ (A) Joint of skull ☐ (B) Shoulder ☐ (C) Elbow joint ☐ (D) Hip joint

32. Which one of the following attaches muscles to bones?

- ☐ (A) Ligaments ☒ (B) Tendons ☐ (C) Hormones ☐ (D) Nerves

33. Which of the following is the hardest connective tissue?

- ☐ (A) Tendon ☐ (B) Ligament ☒ (C) Bone ☐ (D) Cartilage

34. Tendons and ligaments are bands of:

- ☐ (A) muscular tissue ☐ (B) nerve tissue ☐ (C) epidermal tissue ☒ (D) connective tissue

35. Mature bone cells are called:

- ☐ (A) fibrous cartilage ☐ (B) cartilage ☒ (C) Osteocytes ☐ (D) compact bone

36. Tendons and ligaments are bands of:

- ☐ (A) Epidermal tissue ☒ (B) Connective tissue ☐ (C) Nervous tissue ☐ (D) Muscular tissue

37. The names of disease which is caused due to the deficiency of a hormone is:

- ☒ (A) Osteoporosis ☐ (B) Osteoarthritis ☐ (C) AIDS ☐ (D) Gout

38. Nose and larynx are made up of:

- ☐ (A) Fibrous cartilage ☒ (B) Hyaline cartilage ☐ (C) Bone ☐ (D) Elastic cartilage

39. Human arm have bones:

- ☐ (A) 22 ☐ (B) 3 ☒ (C) 6 ☐ (D) 14

40. The movement of an animal as a whole from one place to another is called:

- ☐ (A) Vibration ☐ (B) tropism ☐ (C) None ☒ (D) Locomotion

41. The joints between skull bones are called:

- ☐ (A) Slightly moveable ☐ (B) Hinge joints ☒ (C) Immoveable ☐ (D) Moveable

42. End of muscles attached with moveable bone is called:

- ☐ (A) Extensor ☒ (B) Insertion ☐ (C) Flexor ☐ (D) Origin

43. Hyoid bone is found in:

- ☒ (A) Ear ☐ (B) Chest ☐ (C) Neck ☐ (D) Skull

44. The disorders in which there is an accumulation of uric acid in joints:

- ☐ (A) Osteoporosis ☒ (B) Gout ☐ (C) Osteo-arthritis ☐ (D) Rheumatoid arthritis

45. All of these are the parts of axial skeleton of human except:

- ☐ (A) Ribs ☐ (B) Vertebral column ☒ (C) Shoulder girdle ☐ (D) Sternum

46. The end of skeletal muscle attached with immoveable bone is:

- ☐ (A) Belly ☐ (B) Static end ☐ (C) Insertion ☒ (D) Origin

47. The matrix of cartilage also contains fibers:

- ☐ (A) Lacuna ☐ (B) Glucagon ☐ (C) Insulin ☒ (D) Collagen

48. Bone Marrow is found in:

- ☐ (A) Osteocytes ☒ (B) Spongy bone ☐ (C) Chondrocytes ☐ (D) Compact bone

49. Cartilage is a type of tissue:

- ☒ (A) connective ☐ (B) smooth ☐ (C) cardiac ☐ (D) muscle

50. How many bones are organized into a longitudinal axis of human skeleton?

- ☐ (A) 306 ☐ (B) 302 ☐ (C) 202 ☒ (D) 206

51. How many layers bone has?

- ☒ (A) 2 ☐ (B) 3 ☐ (C) 4 ☐ (D) 1

52. The number of pair of ribs in human are:

- ☐ (A) 11 ☒ (B) 12 ☐ (C) 9 ☐ (D) 12

53. Hip joint is an example ofjoint.

- ☐ (A) Slightly moveable ☐ (B) hinge ☐ (C) immoveable ☒ (D) moveable

54. Sternum is a bone:

- ☒ (A) Chest Bone ☐ (B) Cranium ☐ (C) Hand ☐ (D) Leg

55. Each chondrocyte lies in a fluid spate called present in the matrix of cartilage.

- ☒ (A) lacuna ☐ (B) muscle ☐ (C) joint ☐ (D) Collagen

56. Which is not the part of appendicular skeleton?

- (A) Pelvic girdle (B) Arm (C) Pectoral girdle (D) Skull

57. It is found as covering the ends of long bones:

- (A) Inelastic cartilage (B) hyaline cartilage (C) fibrous cartilage (D) elastic cartilage

58. How many bones make our vertebral column:

- (A) 24 (B) 20 (C) 22 (D) 26

59. Find the ball-and-socket joint:

- (A) Joint at pelvic girdle and leg bones (B) Joint at elbow
(C) Joint in the finger bones (D) Joint of neck and skull bones

60. What are the main components of a bone?

- (A) Compact bone and marrow (B) Marrow, spongy bone; wax
(C) Compact bone, spongy bone, marrow (D) Marrow, compact bone, wax

61. Ball-and-socket joints allow movement in:

- (A) Two direction (B) All directions (C) One direction (D) No direction

62. Which point of attachment on bone is pulled when a muscle contracts?

- (A) insertion (B) origin (C) extension (D) flexion

63. They prevent dislocation of bones at joints:

- (A) Ligaments (B) Cartilage (C) Collagen (D) Tendons

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Subjective

Q1: **Define locomotion and movement.**

Ans: **Locomotion:**

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

Movement:

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

Q2: **What is meant by Exoskeleton?**

Ans: **Exoskeleton:**

Skeleton present outside of body is called exoskeleton.

Q3: **What is meant by Endoskeleton?**

Ans: **Endoskeleton:**

Skeleton present inside of body is called endoskeleton.

Q4: **Define skeletal system.**

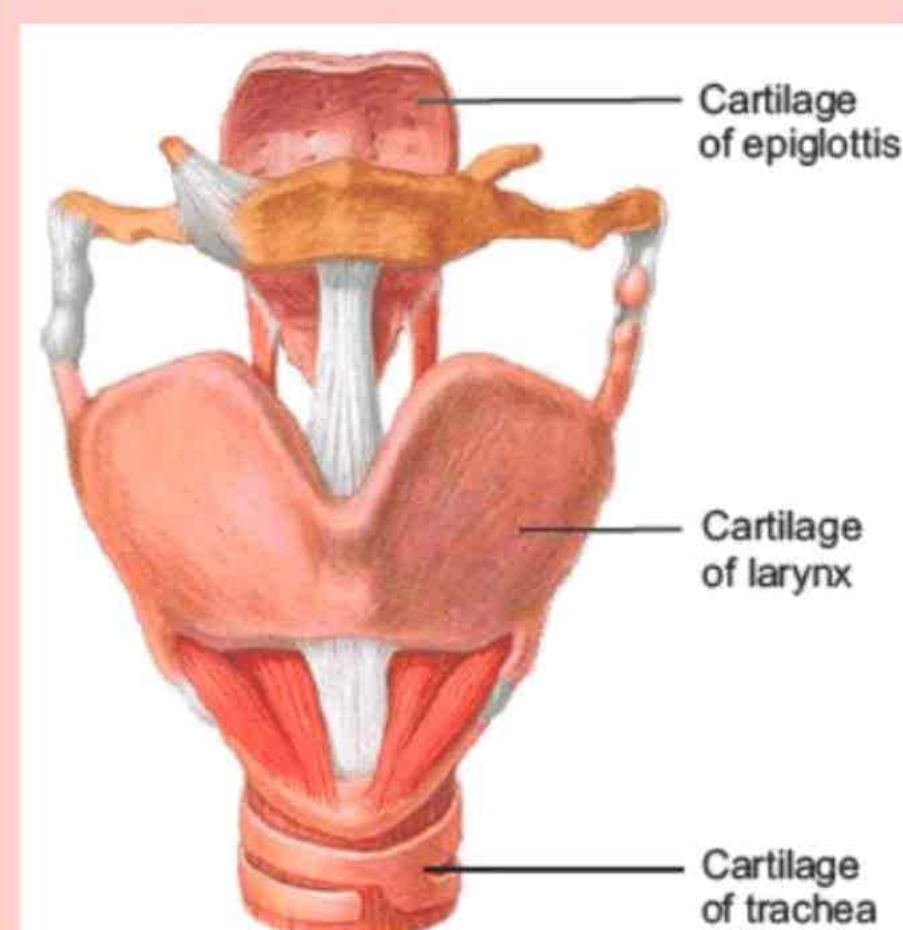
Ans: Skeleton is defined as the framework of hard, articulated structures that provide, physical support, attachment for skeletal muscles and protection for the bodies of animals.

Q5: **What is the role of skeletal system in body?**

Ans: The role of skeletal system in body is:

The big functions of skeletal system are protection, support and movement. In our body, skeleton works very closely

What types of cartilage these are?





with the muscular system to help us move. Skeleton provides protection to many organs. Vertebral column also provides support to our body mass.

Q6: What are the types of connective tissues?

Ans: The types of connective tissues are:

- ❖ Adipose tissue
- ❖ Blood
- ❖ Cartilage
- ❖ Bone

Q7: What is difference between Bone and Cartilage?

Ans: The difference between Bone and Cartilage is:

Bone	Cartilage
Bone is the hardest connective tissue in body. Bones not only move, Support and protect the various parts of the body but also produce red and white blood cells and store minerals.	While cartilage is a dense, clear blue white firm connective tissue. Cartilage contains a single type of cell while bones contain different types of cell.

Q8: What happens in bone density during Osteoporosis?

Ans: In osteoporosis, there is a decreased in density of bone due to loss of calcium and phosphorous.

Causes:

It may due to malnutrition, lack of physical activities, or deficiency of estrogen hormone.

Q9: Write down evolutionary changes that are adapted by the mammals in lower jaw bones.

Ans: During evolution, mammals modified the lower jaw bones and incorporated four of them into the middle ear. This adaption proved beneficial for mammals.

Q10: What is meant by Elastic cartilage?

Ans: Elastic cartilage:

It 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.

Q11: What is meant by Fibrous cartilage?

Ans: Fibrous cartilage:

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

Q12: Define Cartilage. Write the names of its two types.

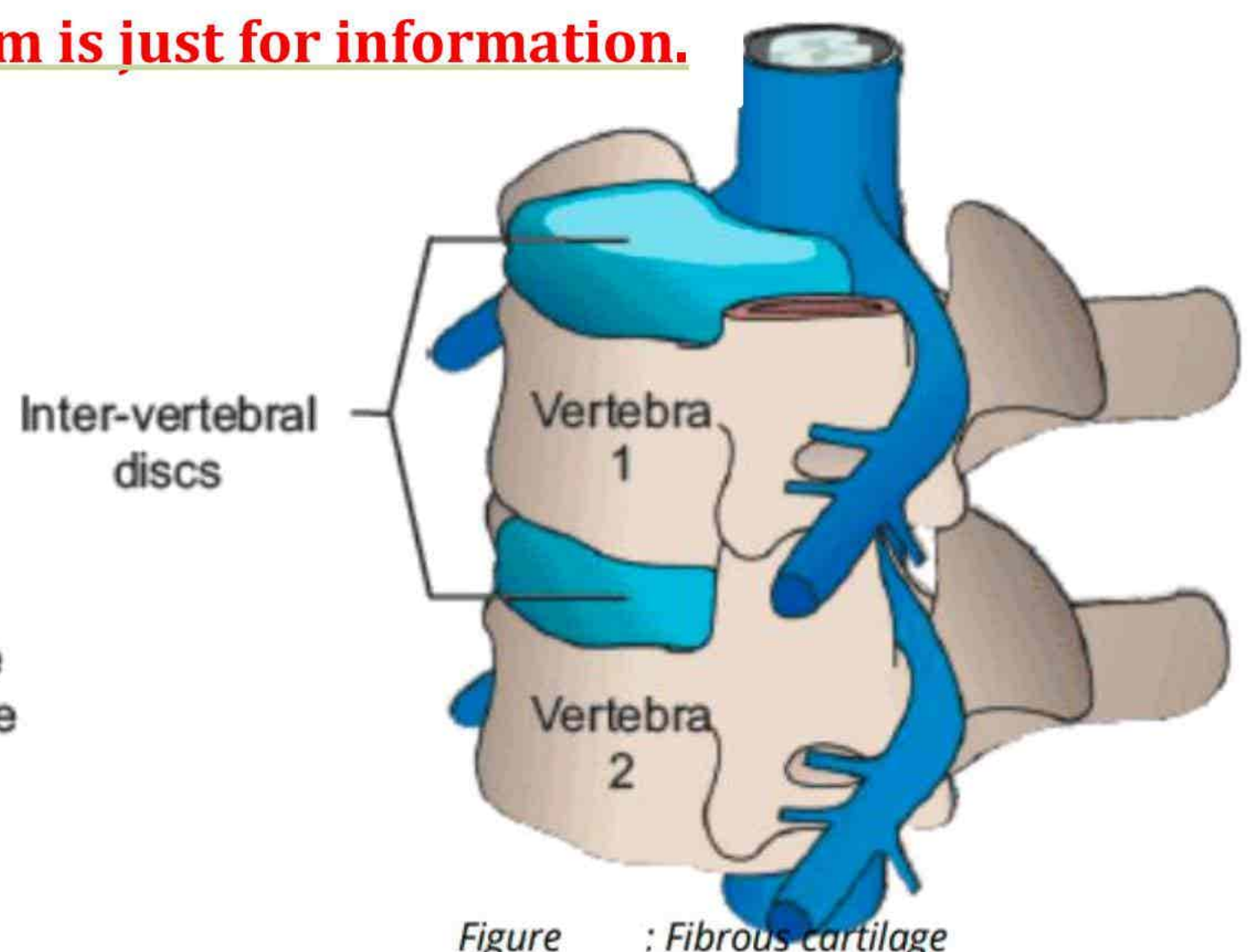
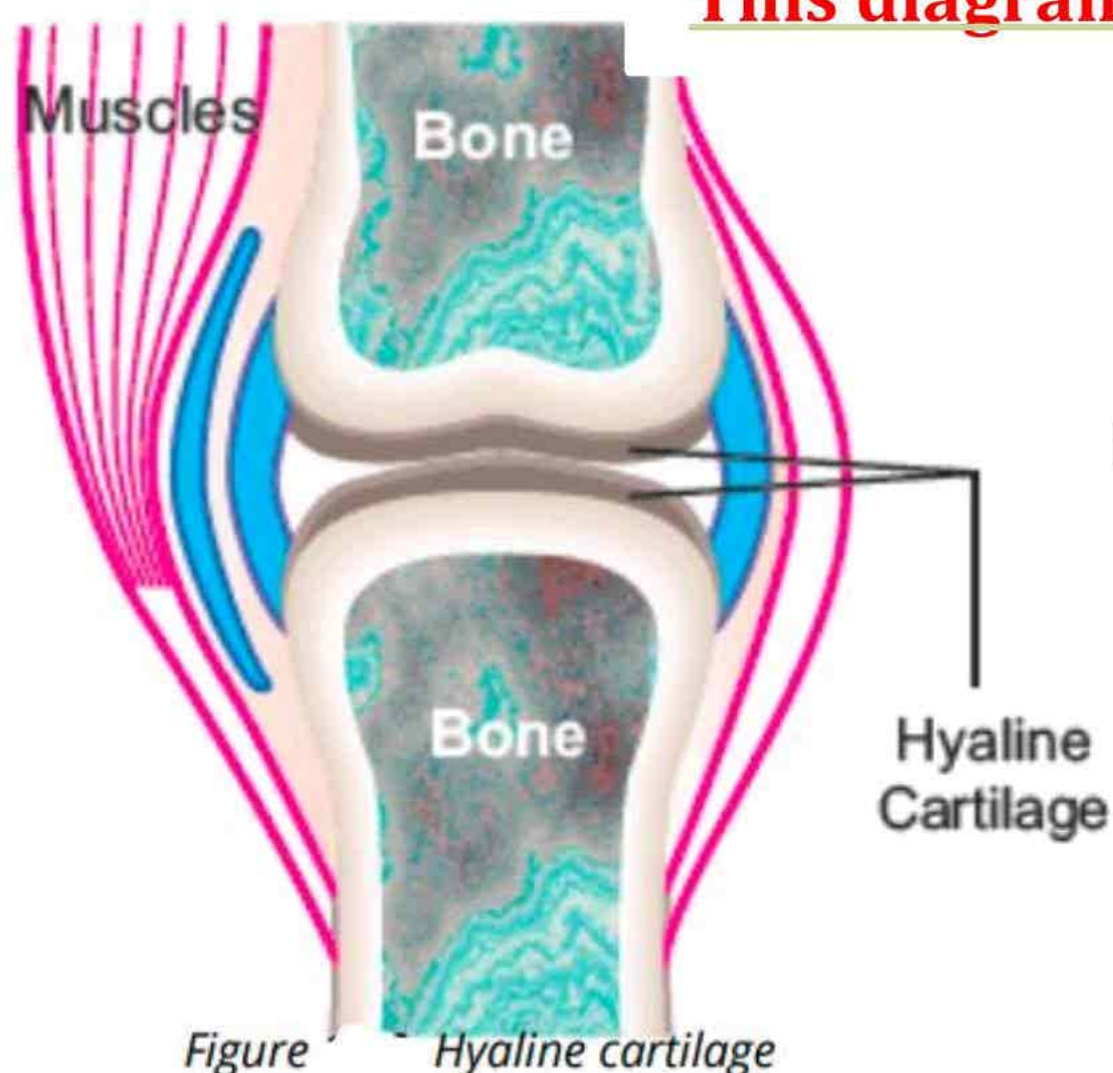
Ans: Cartilage:

Cartilage is dense clear blue white firm connective tissues.

These are the following types of cartilage:

- ❖ Fibrous cartilage
- ❖ Elastic cartilage
- ❖ Hyaline cartilage

This diagram is just for information.



Q13: What is difference between hyaline cartilage and elastic cartilage?

Ans: The difference between hyaline cartilage and elastic cartilage is:

Hyaline Cartilage	Elastic cartilage
❖ Hyaline Cartilage is strong yet flexible.	❖ Elastic cartilage is similar in structure to hyaline cartilage.
❖ It is found covering the ends of long bones, in the nose, larynx, trachea, and bronchial tubes.	❖ It is quite strong but has elasticity due to a network of elastic fibers in addition to collagen fibers found in epiglottis, pinna etc.

Q14: Differentiate between compact bone to that of spongy bone.

Ans: The difference between compact bone and spongy bone is:

Compact bone	Spongy bone
The hard outer layer of a bone is called compact bone.	Spongy bone is the interior of bone is soft and porous. It contains blood vessels and bone marrow.

Q15: Write the names of the cells of cartilage and bone.

Ans: The cells of cartilage are called chondrocytes while the mature bone cells are called osteocytes.

Q16: Give structure of cartilage. And Write two minerals are found in bones.

Ans: The cartilage is made up of cells called chondrocytes. Each cell lies in a fluid space called lacuna present in matrix of cartilage. Blood vessels do not enter cartilage.

The minerals are found in bones are:

- ❖ Calcium
- ❖ Phosphate

This diagram is just for information.

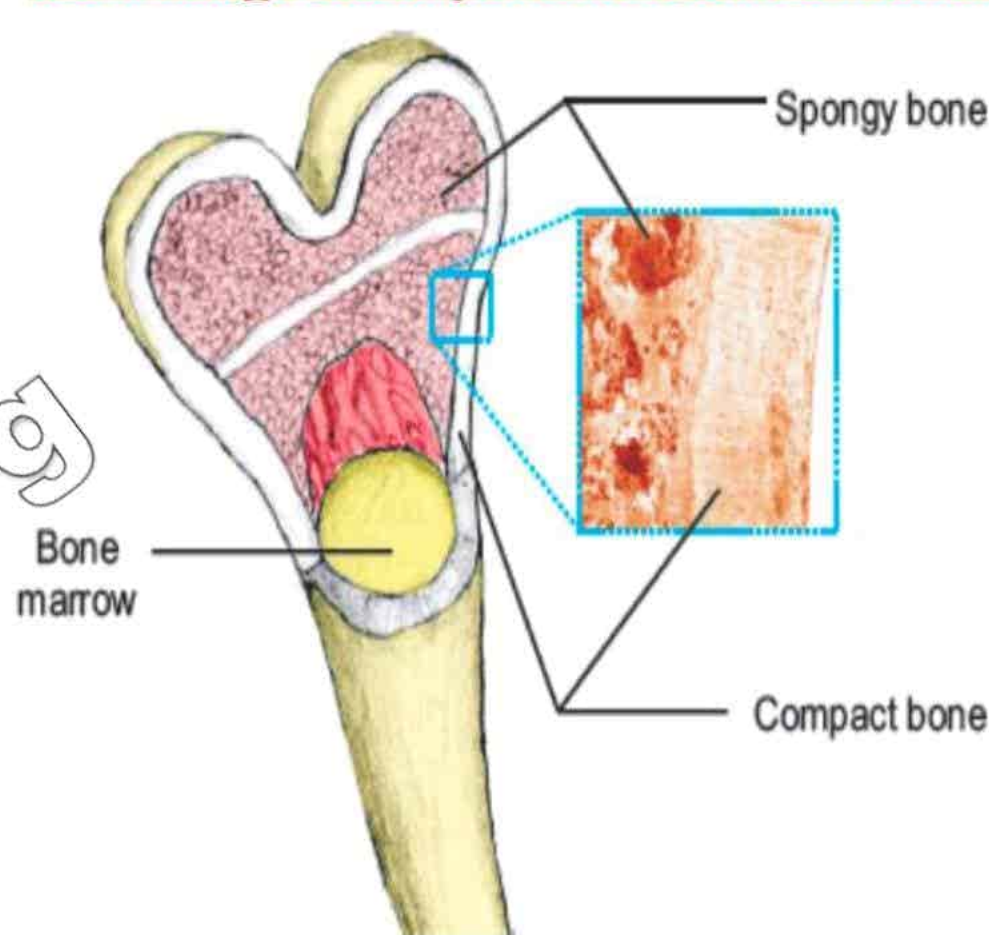


Figure : Compact and spongy bone

Q17: What do you know about Andreas vesalius?

Ans: Andreas Vesalius (1514-1564) is honoured for developing modern anatomical studies. Vesalius 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.

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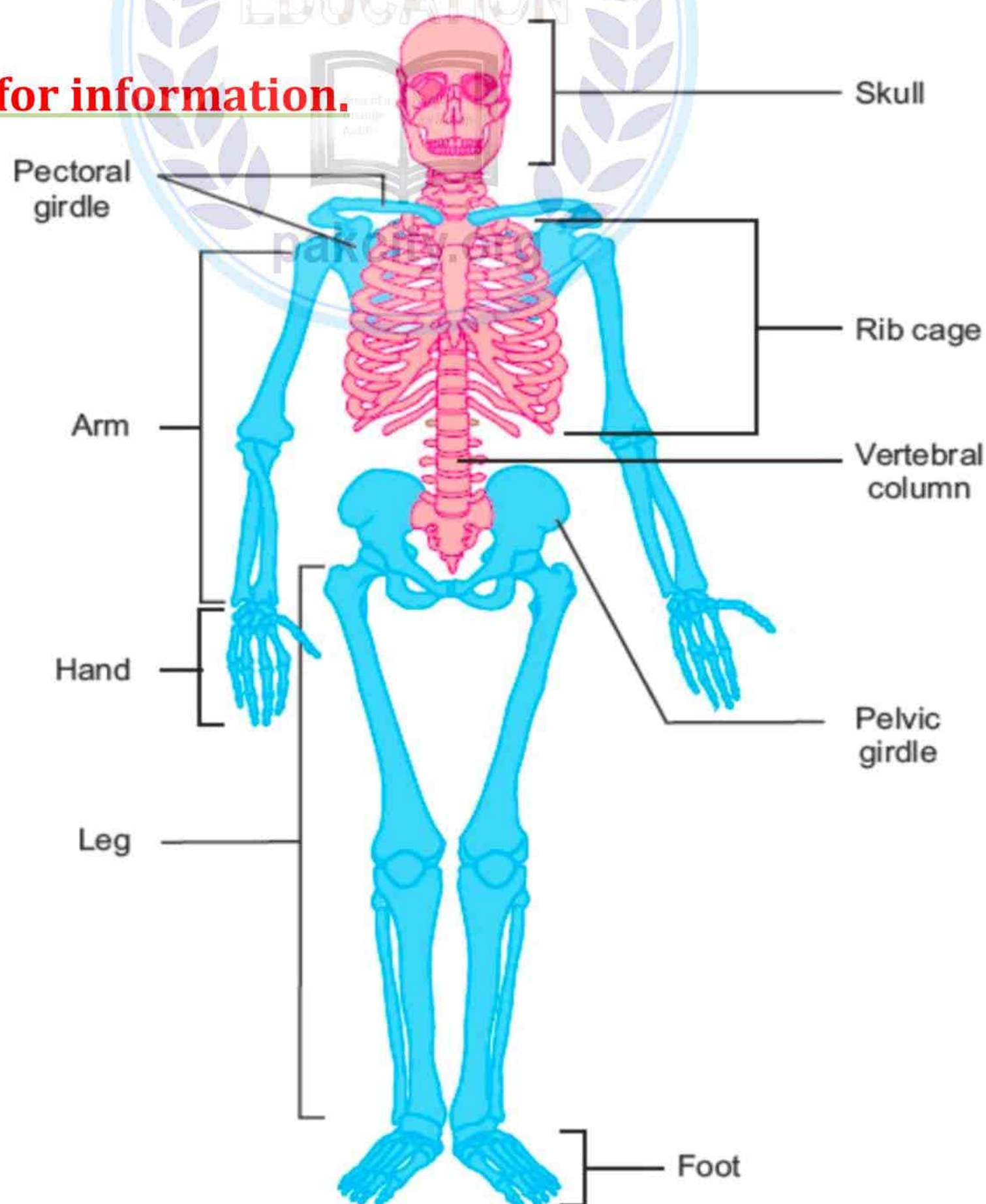


Figure Human skeleton

Q18: What is Appendicular Skeleton?

Ans: Appendicular Skeleton:

The skeleton covering jointer is called appendicular.
It is composed of 126 bones.

Q19: Write names of main bones of human axial skeleton.

Ans: The main bones of human axial skeleton are:

- ❖ Hyoid bone.
- ❖ Skull bones.
- ❖ Middle ear ossicles.
- ❖ Vertebral column.
- ❖ Chest bones.

Q20: Write down the number of bones in pectoral girdle and pelvic girdle.

Ans: Pectoral (Shoulder) girdle is made of 4 bones while pelvic girdle (hips) has two bones.

Q21: How many bones are in vertebral column? Write name of biggest bone in human body.

Ans: Vertebral column contains 26 bones (vertebrae), Thigh bone is biggest bone in human body.

Q22: Which is longest bone in our body?

Ans: Thigh bone is the longest bone in our body.

Q23: Write the names of chest bones.

Ans: The chest is made of a chest bone called sternum and 24 (12 pairs) ribs.

Q24: How moment produced in bones?

Ans: The movements in bones are brought about by the contractions of skeletal muscles, which are attached with them by tendons.

Q25: Define joint. Write the names of its types.

Ans: Joints:

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

Types of Joints:

- ❖ Immoveable joints.
- ❖ Slightly moveable joints.
- ❖ Moveable joints.

Q26: Differentiate between hinge joints and ball and socket joints.

Ans: The difference between hinge joints and ball and socket joints is:

<i>Hinge joints</i>	<i>Ball and Socket joints</i>
<ul style="list-style-type: none"> ❖ Hinge joints move back and forth like the hinge on a door and allow movements in one plane only. ❖ The knee and elbow are hinge joints. 	<ul style="list-style-type: none"> ❖ Ball and socket joints allow movement in all directions. ❖ The hip and shoulder joints are ball and socket joints.

This diagram is just for information.

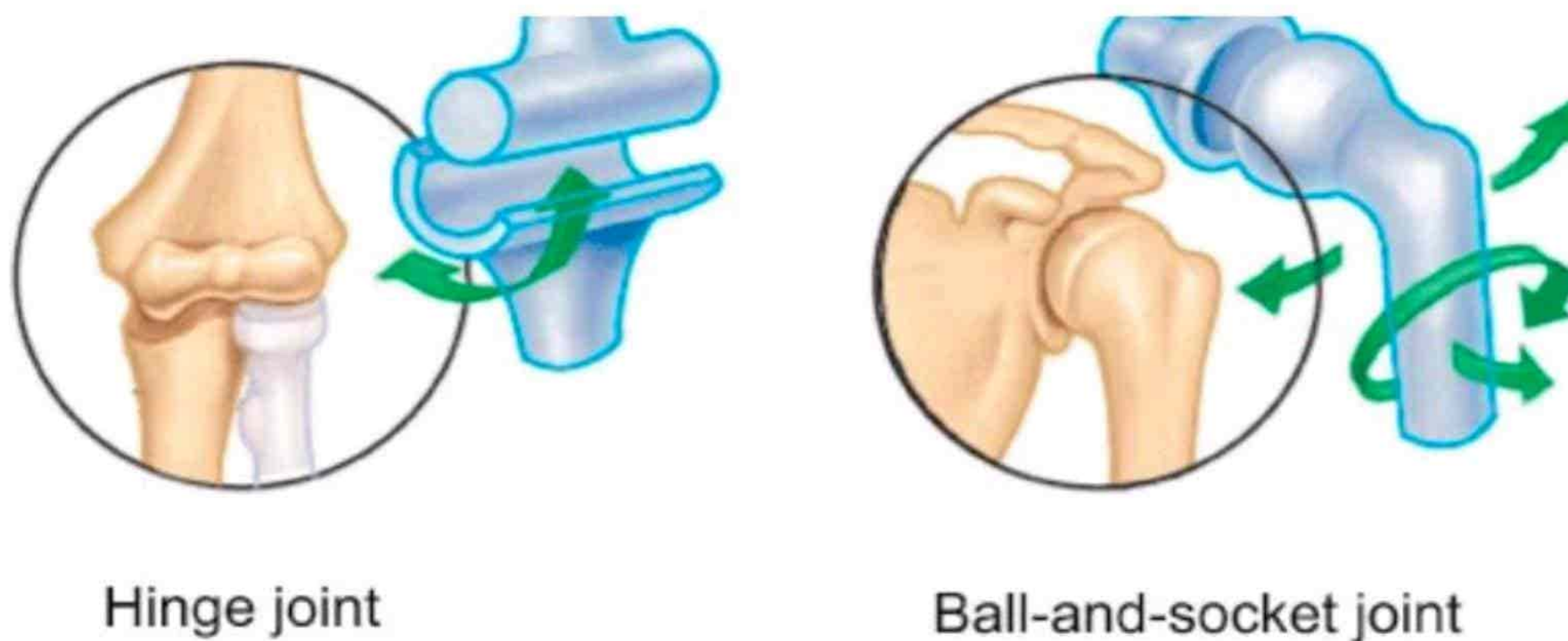


Figure Two types of moveable joints

Q27: **What is the difference between immoveable (fixed) and slightly moveable joints?**

Ans: The difference between immoveable (fixed) and slightly moveable joints is:

Immoveable joints	Slightly moveable joints
Such joints allow no movement. The joint between the skull bones.	Such joints allow slight movement. The joint between the vertebrae.

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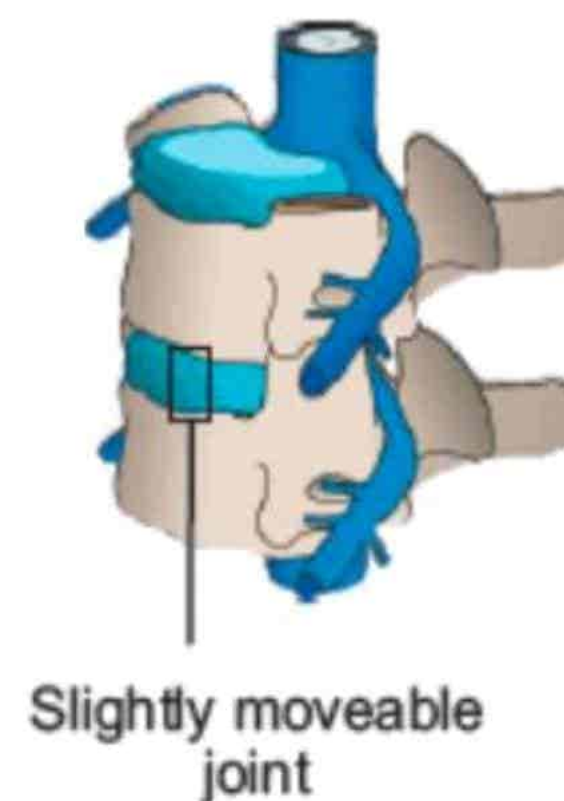
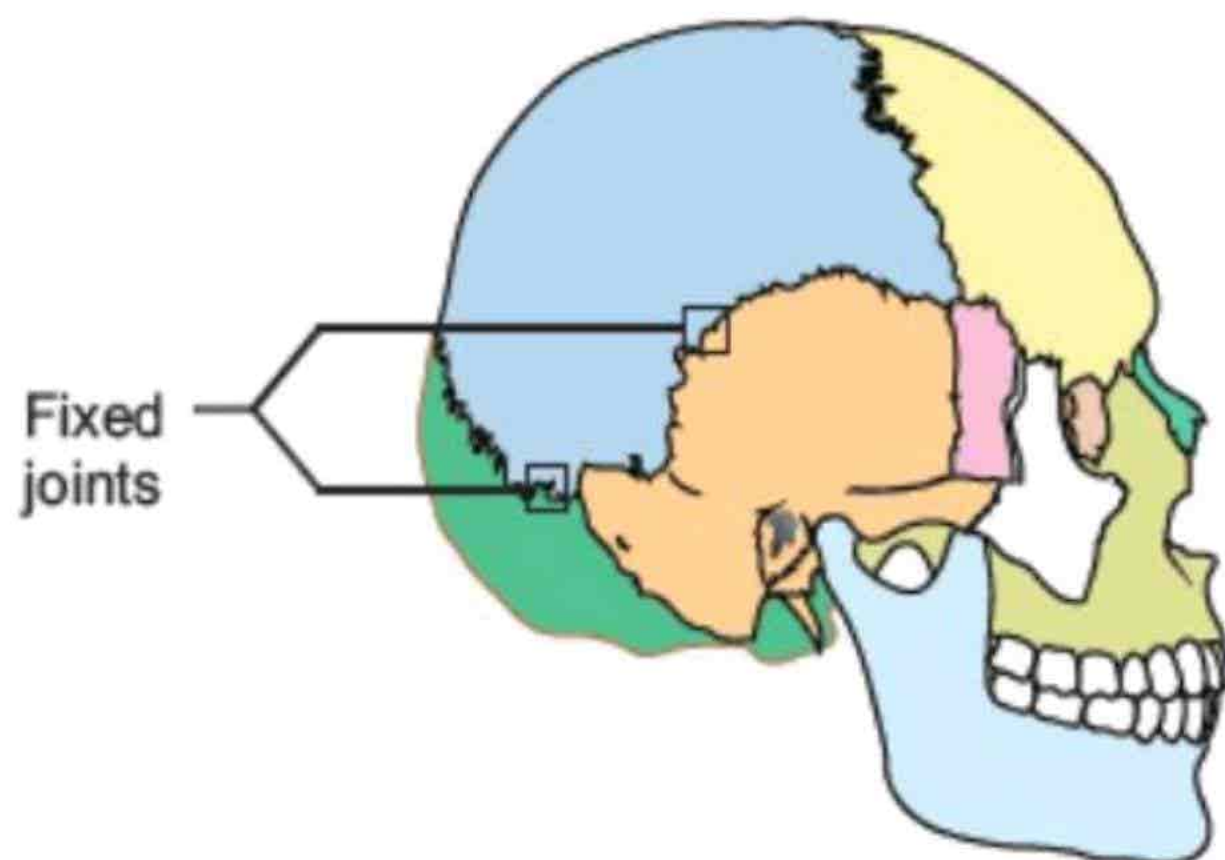


Figure Fixed and slightly moveable joints

Q28: **Define Joint. And what is the difference between fixed and moveable joints.**

Ans: **Joint:**

A joint is the location at which two or more bones make contact.

The difference between immoveable (fixed) and slightly moveable joints is:

Immovable (fixed) joint	Moveable joints
These allow no movement e.g., joints between skull.	They allow variety of movement e.g. shoulder joint and hip joints.

Q29: **Differentiate between antagonists and antagonism.**

Ans: The difference between antagonists and antagonism is:

Antagonists	Antagonism
Skeletal muscles are usually in pairs of antagonists. In an antagonist's pair, both muscles do opposite jobs.	When one muscle contracts the other relaxes and this phenomenon are known as antagonism.

Q30: **Define flexion and extension.**

Ans: The difference between flexion and extension is:

Flexion	Extension
When a muscle contracts and bends the joint, it is known as flexor muscle and the movement is called flexion.	When a muscle contracts and straightens the joint, it is known as extensor muscle and the movement is called extension.

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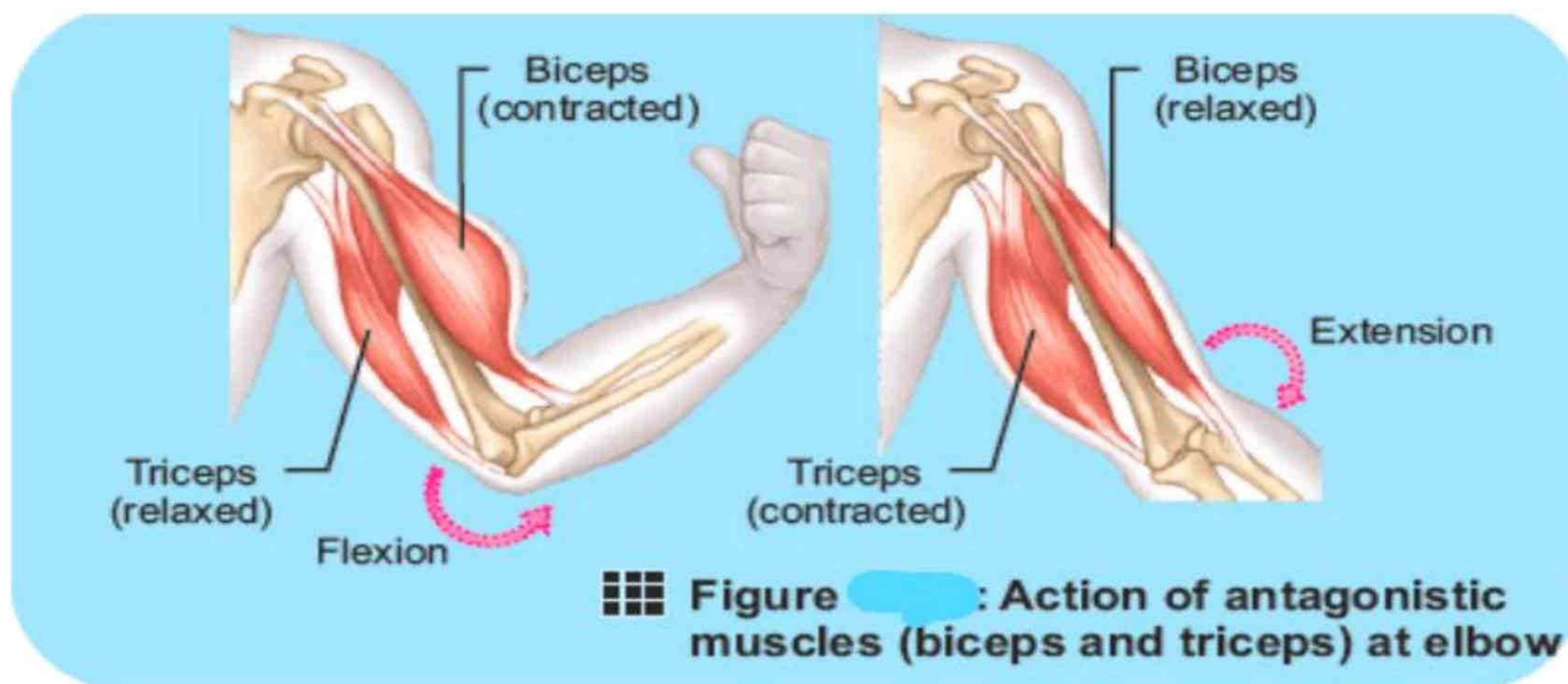


Figure : Action of antagonistic muscles (biceps and triceps) at elbow

Figure Action of antagonistic muscles (biceps and triceps) at elbow

Q31: Differentiate between origin and insertion of muscle.

Ans: The difference between origin and insertion of muscle is:

Origin muscle	Insertion muscle
One end of skeletal muscle is always attach with some immoveable bone this end bone is called origin.	One end of muscle is attached with some moveable bones. This end is this end bone is called insertion.

Q32: What are biceps and triceps?

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

Q33: What is Arthritis? Write names of its types.

Ans: Arthritis:

Arthritis means inflammation in joints.

Types of Arthritis:

- ❖ Gout
- ❖ Osteoarthritis
- ❖ Rheumatoid arthritis

Q34: What is the difference between osteoarthritis and rheumatoid arthritis?

Ans: The difference between osteoarthritis and rheumatoid arthritis is:

Osteoarthritis	Rheumatoid Arthritis
It is due to degeneration in the cartilage present at joints or due to decrease in lubricant production at joints.	It involves the inflammation of membrane at joints.

Q35: Write down cause of Rheumatoid Arthritis, also give its two symptoms.

Ans: It involves the inflammation of membranes at joints.

Symptoms:

Its symptoms include fatigue, low grade fever, pain and stiffness in joints.

Q36: Write note on Gout.

Ans: Gout:

Gout is characterized by accumulation of uric acid crystals in moveable joints. It is a type of arthritis. And it generally attacks the toe joints.

Q37: Write down two disorders along with one reason of each of human Skeletal.

Ans: Two disorders along with one reason of each of human Skeletal are:

- ❖ It is a bone disease in adults, especially in old people. In this, there is a decrease in density, of bones due to loss of calcium and phosphorous. It may be caused due to malnutrition (lack of protein and vitamin C)
- ❖ Arthritis means "inflammation in joints" It is common in old age and in women. It is characterized by pain and stiffness at joints.

Q38: What happened when the reproductive cycle stops in females?

Ans: When the reproductive cycle stops in females, not enough estrogen is secreted.

Q39: How skeleton provides protection to many internal organs?

Ans: Skeleton provides protection to many internal organs e.g. skull protects brain, vertebral column protects spinal cord and ribs protect most of our other internal organs. Vertebral column also provides the main support to our body mass.

Q40: What is Lacuna?

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

Q41: What are the ligaments and tendons?

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

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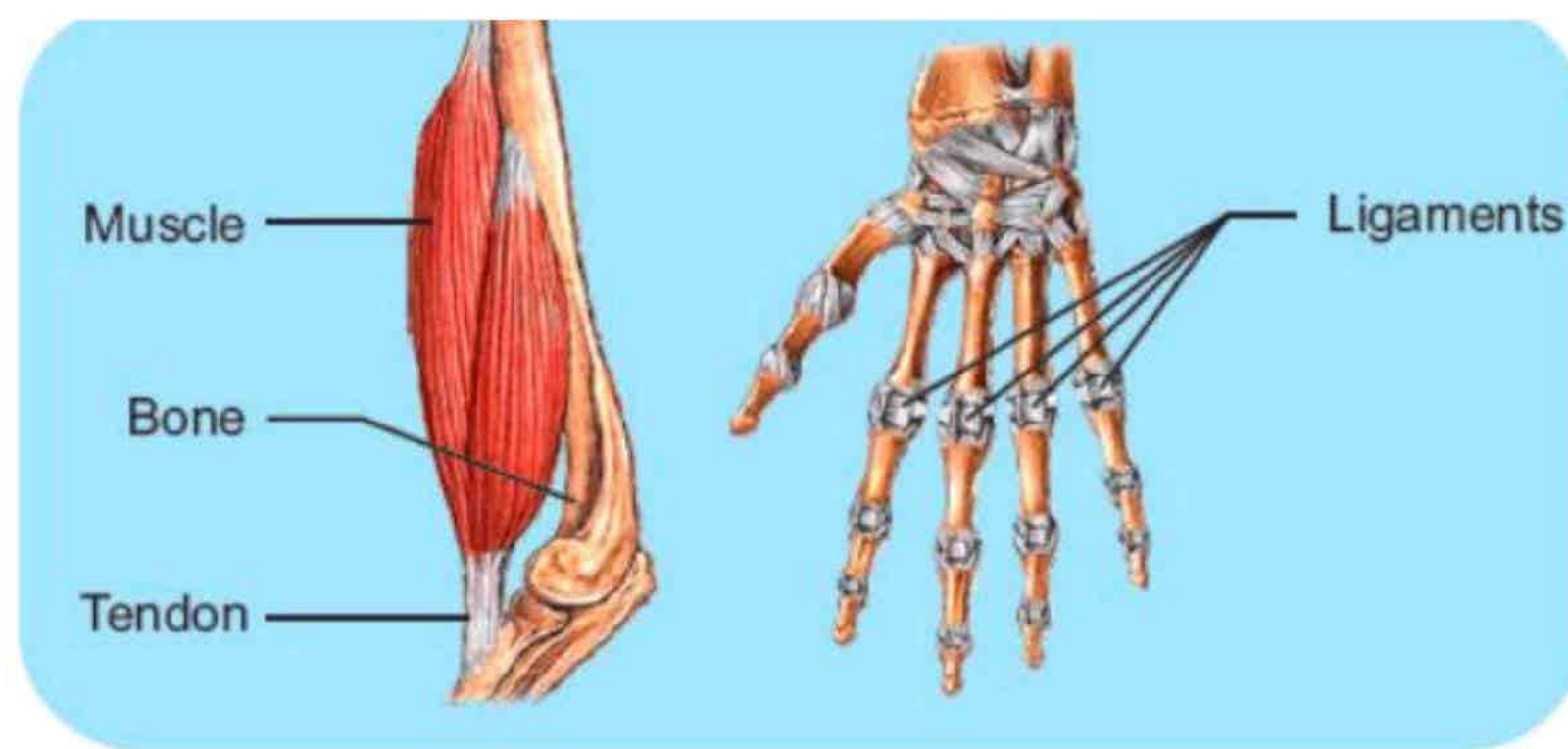


Figure : Tendons and ligaments

Chapter : 13

Support and Movement



★ Imp.Long Questions ★

- Q.1: What is Bone? Explain its composition with diagram. OR What is bone. Explain its two-kinds.
- Q.2: What is cartilage? Discuss its types. V.imp
- Q.3: Describe Components of Human Skeleton.
- Q.4: What are ligaments and tendons? What functions do they perform?
- Q.5: Describe the types of joints with examples. V.imp
- Q.6: How many types of antagonistic muscles are there and how they work?
- Q.7: Write a note on the role of biceps and triceps muscle.
- Q.8: What is Antagonism? Describe it with the example of Flexor Muscle, and Extensor Muscle. V.imp
- Q.9: Discuss arthritis and its types? V.imp
- Q.10: Describe the main components of the axial and appendicular skeleton of human.

