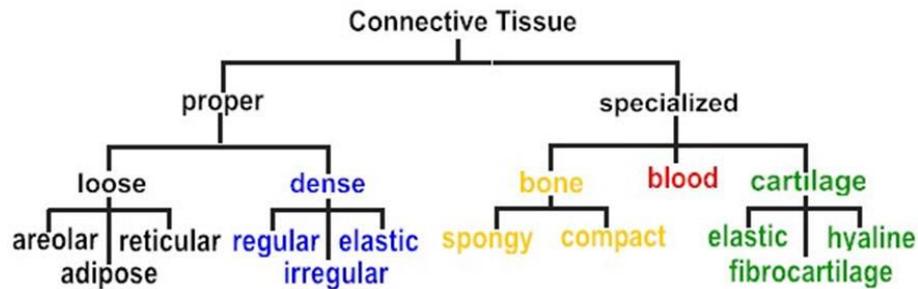


(i) **Name and describe the structure and function of different types of connective tissue.**

- Connective Tissue:

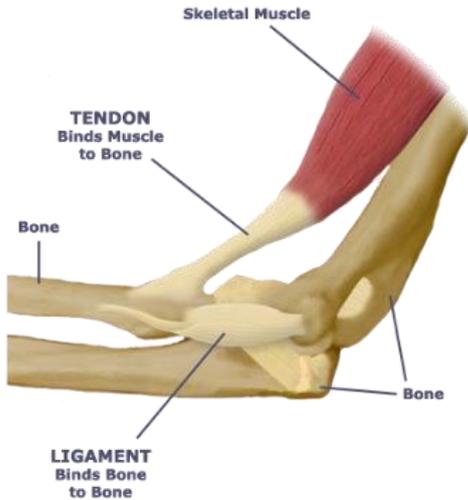
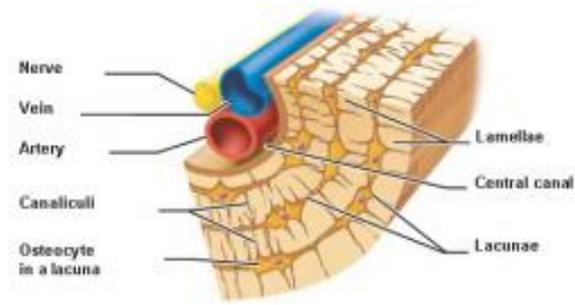


- Composed mainly of a matrix (composed of fibres and ground substances), within which connective tissue cells are bound.
- *Types of Fibres:*
 - Collagen- High tensile strength, doesn't stretch much.
 - Elastic- Elastic, stretches without breaking.
 - Reticular- Thin collagen fibres, net-like.
- *Ground Substance:*
 - Gelatinous proteoglycan (protein/sugar)
 - Sponge-like, absorbs water.
 - Resists compressive force.

<i>Loose Connective Tissue</i>	<i>Dense Connective Tissue</i>
<p>- Lots of matrix but few fibres; found between muscles and as a thin, membranous sheet between organs.</p>	<p>- Lots of fibres but few matrix.</p>
<p>- <i>Adipose tissue</i> (fat): Highly saturated with of fat cells (adipose cells). Role is to store energy in the form of fat, and cushion and insulate the body.</p>	<p>- <i>Cartilage</i></p>
<p>- <i>Areolar</i> (beneath epithelium): Composed of collagen, elastic tissue, and reticular fibres. Role is to bind skin to the muscle beneath, enabling high degree of movement.</p>	<p>- <i>Bone</i></p> <p>- <i>Tendon</i></p>
<p>- <i>Mesenchyme</i> (embryonic): Found mostly during the embryonic stage, and composed mainly of ground substances with few cells and fibres. Important in development of structures during the embryonic and foetal stages of animal life.</p>	<p>- <i>Ligament</i></p> <p>- <i>Fascia</i></p>

- **Bone:**

- Matrix composed of mineral salts and collagen fibres.
- Hardest connective tissue due to the presence of salts.
- Consists of special cells (osteocytes = bone cells).
- Can be classified as compact or spongy, or by length and shape.
- Great tensile and compressive strength, and rigidity.
- *Function:* Rigid skeletal support, protects organs and soft tissues, provides movement, stores minerals, and houses red bone marrow.



- **Tendon:**

- A tough but flexible band of fibrous collagen tissue, arranged in a parallel fashion to increase tensile strength but reduce compressive strength.
- High flexibility and houses a blood supply and sensory nerve supply.
- Cell = fibrocytic, matrix (5%).
- *Function:* Provides a mean of attaching muscle to bone or cartilage.

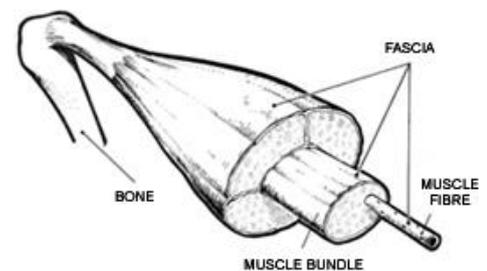
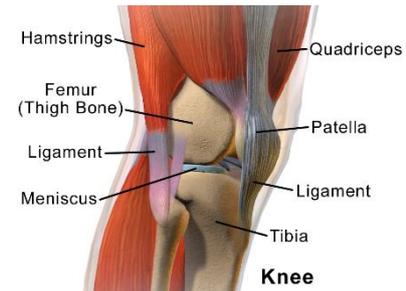
- **Ligament:**

- A short band of tough, flexible fibrous connective tissue which connects two bones or cartilages or holds together a joint.
- Ligament fibres course in the same direction to

provide tensile strength but little stretch, so they're able to withstand great pressure.

- *Function:*

- Sensory organs: proprioception (sense of the relative position of body segments in relation to other body segments).
- Mechanical constraint:
 - Aligned with line of pull
 - Acts at end of range
 - Limits wanted movements
 - Prevents unwanted movements



- **Fascia:**

- A band or flat irregular sheet of connective tissue, primarily collagen, beneath the skin.
- Resists pull from all directions.
- *Function:* Surrounds organs, peripheral nerves, and blood vessels to provide some physical isolation and stability.

(ii) Describe the different types of cartilage

- Cartilage:
 - Specialised form of connective tissue which consists of a dense network of collagen, elastic fibres, and special cells (chondrocytes = cartilage cell).
 - Jelly-like matrix
 - Found mainly at the ends of long bones (at the joints).
 - Tensile strength of cartilage keeps fibres from being easily separated when pulled, while the compressive strength lets it retain its form by being resistant to crushing forces.
 - *Function:* To cover and protect long bones.
 - *Types of cartilage:*

<i>Hyaline:</i>	<i>Elastic:</i>	<i>Fibrocartilage:</i>
<ul style="list-style-type: none"> - Glassy and smooth to decrease friction for bones. - High tensile strength due to collagen, and some elasticity. - Resists pressure. - Found lining joints. <p>(Cartilaginous surface of ribcage)</p>	<ul style="list-style-type: none"> - More elastin fibres. - More flexible, therefore tolerates distortion. <p>(Ear, nose, epiglottis)</p>	<ul style="list-style-type: none"> - More collagen fibre. - Stronger, therefore resists compression. - Acts as a shock absorber and provides smooth surface <p>(Vertebrae of spinal column, pubic bone, TMJ)</p>

(iii) Understand the basic structure of the peripheral nervous system

- The peripheral nervous system is the portion of the nervous system serving the peripheral body.
- Nerves leave the brain stem to activate muscles of the body, and sensations from these peripheral regions are translated to the CNS by peripheral nerves.
- The CNS and PNS [provides means by which we receive and process information, perceive and make sense of that information, and then act on that information.
- Structure of Peripheral Nervous System:
 - Consists of the cranial nerves and spinal nerves.
 - Both nerves receive orders from the cerebral cortex or any higher brain structure.
 - *Cranial Nerves:*
 - 12 pairs of cranial nerves.
 - Serves the area of the head and neck.
 - Sensory cranial nerves relay information from the periphery to the CNS.
 - *Spinal Nerves:*
 - 31 pairs of cranial nerves.
 - Serves the rest of the body.

Introduction to Skull Growth and Development

(i) Identify the bones of the skull.

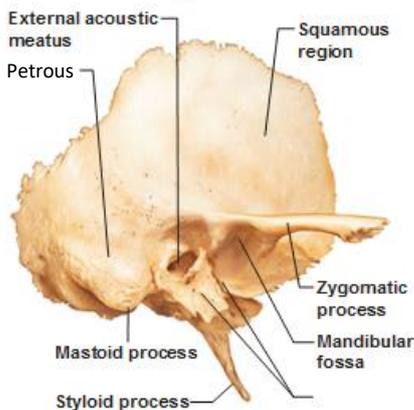
- The human skull contains 22 bones.
- Function of Skull:
 - Supports and protects the delicate nervous tissue of the brain.
 - Gives shape to the skull.
 - Guards the entrance to digestive and respiratory system.

• Type of Bones:

<i>Cranium:</i>	<i>Facial Bones:</i>
<ul style="list-style-type: none"> - Made up of 8 bones. - <i>Includes:</i> frontal, parietal, temporal, occipital, sphenoid, ethmoid. 	<ul style="list-style-type: none"> - Made up of 14 bones. - Lower front of the skull. - <i>Includes:</i> nasal, zygomatic, palatine, maxilla, mandible.

- Frontal Bone:
 - Comprises of the forehead, cranial case, and the upper orbit of the eye.
 - Supports and protects the delicate nervous tissue of the brain.
 - Gives shape to the skull and supports several muscles of the head.
- Parietal Bone:
 - Parietal bones overlie the parietal lobes of the cerebrum and form the middle portion of the braincase.
 - United by the sagittal suture, running from the frontal bone to the occipital bone.
 - Forms the bulging sides and roof of the cranium.
 - Provides mechanical protection of the brain.
- Temporal Bone:
 - Forms parts of the sides and base of the cranium.
 - Provides mechanical protection of the brain.
 - From the side view, temporal bone is extremely dense and contains important landmarks.

The Temporal Bone



- *Squamous Part*- Adjacent to the squamous suture and is fan-shaped and thin.
- *Petrous Part*- Includes the cochlea (inner ear) and the semi-circular canals
- *Mastoid Process*- Bony prominence felt behind the earlobe.
- *Styloid Process*- Bony prominence beneath the external auditory meatus and medial to mastoid process.
- *Mandibular Fossa*- Depression in the temporal bone that articulates with the mandible.
- *Articular Tubercle*- Deep concavity at the root of the zygomatic arch.