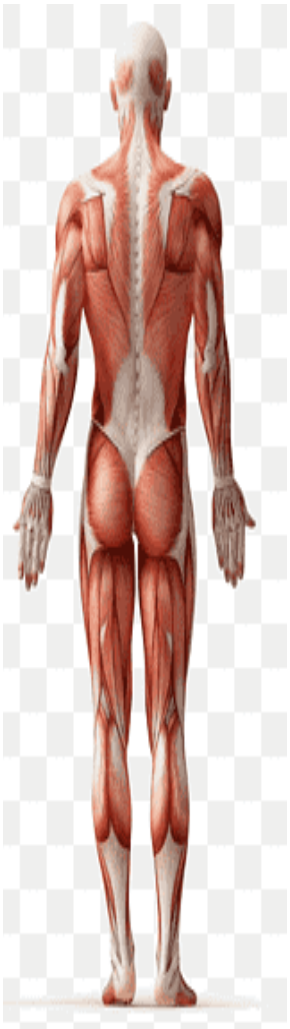
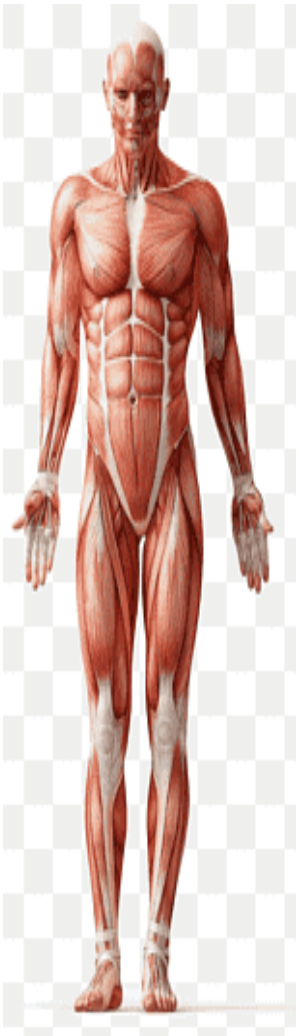
Republic of Iraq

Ministry of higher Education and Scientific Research
AL- Furat AL –Awsat Technical University
Technical Institute of Karbala
Community Health Department

Training Package In Anatomy



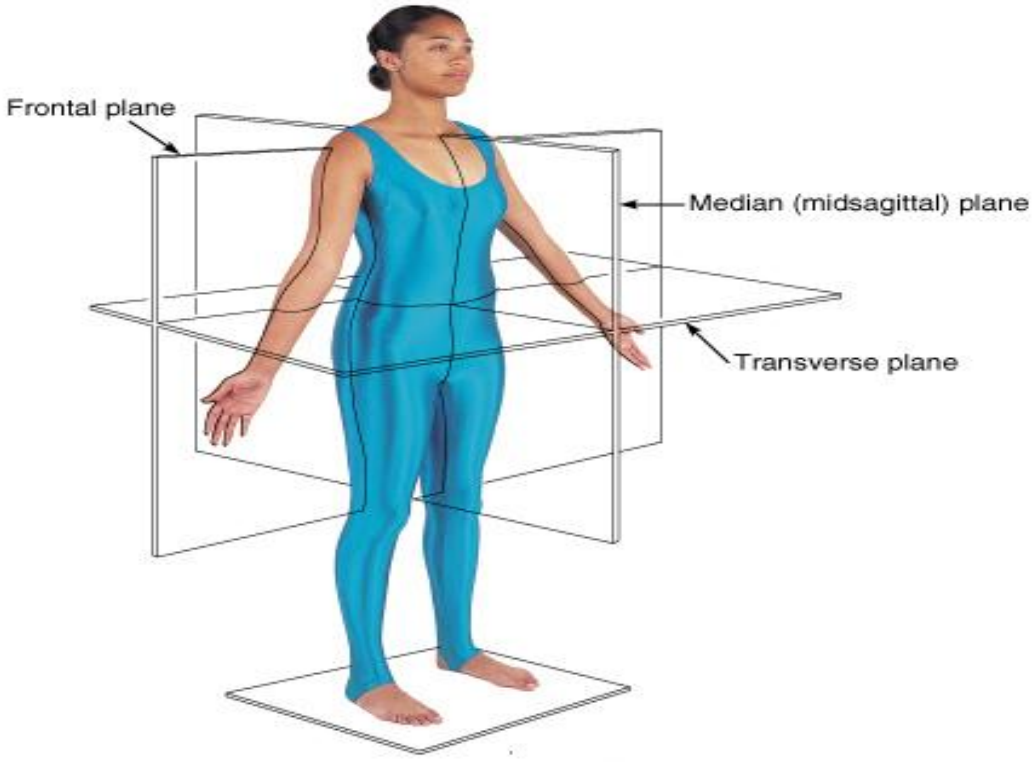


For
Students of first level
Community Health Department

Assist.Prof. Zahra maki Mahmood
Teacher
2021-2022

The first modular unit

Introduction in Anatomy



1 / over view

1/A-Target population: -

This unit Learning package had been designed to the first class students in the community health Dept. KARBALA institute Technology.

1/B-Rationale: -

Anatomy is very important subject to be studied in order to have a full knowledge about its definition, anatomical position, external features, anatomical directions, anatomical movements and anatomical planes and lines, for this reason this unit is designed to identify the students of physiotherapy department about this subject cause of the studying of the physiotherapy depends basically upon the anatomy subject and there is a strong relation between them.

1/C-Central Idea: -

1-Anatomy definition.
2-Anatomical position.
3-External features.
4-Anatomical directions.
5-Anatomical movements.
6-Anatomical planes.
7-Anatomical lines.

1/D-Instructions: -

1-Study over view thoroughly.
2-Determine the performance objectives.
3-Do the pretest and if you have: -
A-Got 9 or more you do not need to proceed.
B-Got less than 9you have to study this modular unit very well.
4-After studying the text of this modular unit, do the post test, and if you have: -
A-Got 9 or more, go to the second modular unit.
B-Got less than 9, go back and return to study this modular unit; or any part of it; and then return to perform the posttest again.

2/performance objectives :-

After studying this modular unit, the student will be capable to:
1-Define the anatomy.
2-Know the anatomical position.
3-Mention the external features of the body.
4-Determine the anatomical directions.
5-Named the anatomical movements.
6-Divided the human body into planes.
7-Divided the human body into lines.

3/pre test :-

Circle the correct answer of the following: -
1-Anatomy definition means: -

a- Study of different parts of the body related to its shapes, place, work and its relation with each other.
b- Study of body structures according to their functions.
c- Study of structures of the body systems and their shapes.
d- Study of structures of the body systems and their positions.

2-Anatomical position is: -
a- The body standing with arms at sides and palms facing backward.
b- The body sitting with arms at sides and palms facing foreword.
c-The body erect, standing on his feet and Palm of the hands directed to the anterior.
d-The body sitting with arms at sides and palms facing backward.

3-Anterior direction in anatomy means: -

a- The upper part of the body.
b- The back side of the body.
c- The front side of the body.
d- Closer to the body midline.

4-Inferior direction in the anatomy means: -

a- Away farthest to the head.
b- Away from the body midline.
c- Toward the surface of the body.
d- The frontal side of the body.

5- External direction in the anatomy means: -

a-The back side of the body
b- Away from the body midline
c-Toward the surface of the body
d- Some structures or organs to the body surface (outer).

6. Medial means: -

a- The external part to the medial plain.
b- The nearest part to the medial plain.
c- The inner part to the medial plain.
d- The outer part to the medial plain.

7. Transverse plane also called:

a- Horizontal plains
b- sagittal plane.
c. subcostal plain.
d. Vertical Plain.

8. **The left hypochondrial regions contain: -**

a- spleen, stomach, left kidney and pancreas.
b- Stomach and pancreas.
c- Spleen, left kidney and pancreas.
d- Stomach, left kidney and pancreas.

9. **The umbilical region contain: -**

a. large intestine and left kidney.
b. part of small and large intestine.
c. part of small and left kidney.
d. part of small and large intestine and left kidney.

10. Median plane this plain divides the body…… into right and left sides.

a- Vertically.

b- Medially.
c- Laterally.
d- Horizontally.

Note: -
-Check your answers in key answer page at the ending of this modular unit.
- (1) degree for each.

4/ the text:-

Introduction and definition of the Anatomy

Anatomy: is the science that study the parts of the body according to its shape, place, work and its relation with each other.

The term **Anatomy** "anatemno" derives from a Greek or Latin word that means "to cut up". In the past, the word *anatomize* was more commonly used than the word *dissect*.

Methods or Branches of studying anatomy: -
1. Systemic anatomy.
2. Topographic anatomy.
3. Living or Dynamic anatomy.

Anatomical position: It is the position in which the body: -
- a- Body erect.
- b- Standing on his feet and slightly apart.
- c- Palms facing forward.
- d- Thumbs point away from body.

Quiz / 1
Define Anatomy

Note: -
-Check your answers in key answer page at the ending of this modular unit.
- (1) degree for each.

Quiz / 2
Define the anatomical position

Note: -
-Check your answers in key answer page at the ending of this modular unit.

Body Planes and Sections

Surface anatomy of the body: it is study the position of the internal organ on the surface of the body according to the body prominence.
Or:
It is the imagination lines that find by necked eye or palpation.

Planes used to determine the right anatomical position of the human body. In order to visualize and study the structural arrangements of various organs, the body may be sectioned (cut) and diagrammed accordingly to planes of reference.

- **Planes**: are imaginary flat surfaces that are used to divide the body or organs into definite areas & include: -

1-Sagittal plane also called **(median plane)** or vertical plane: divides the body into right and left sides has two edges or (margins) anterior and posterior which are called (anterior median line and posterior median line), there are two types: -

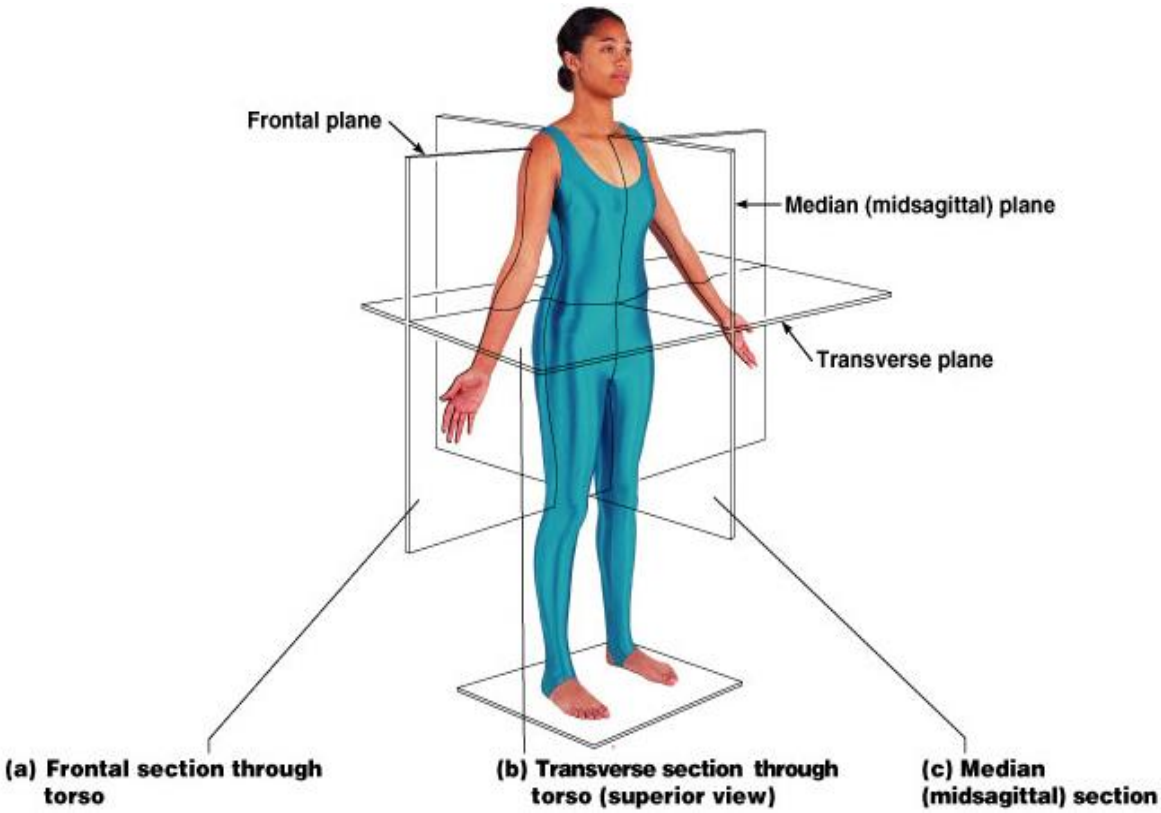
A-Midsagittal plane: divides body into equal right and left sides.

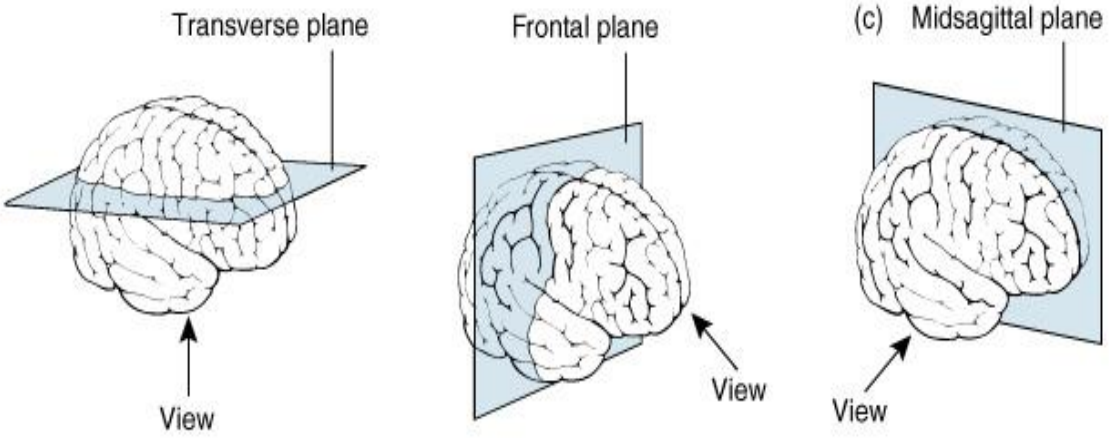
B-Parasagittal plane: divides body into unequal right and left sides.

2-Frontal or coronal plane: divides the body or an organ into anterior (front) and posterior (back) portions.

3-Transverse plane also called **cross-sectional** or **horizontal plane**: divides the body or an organ into superior (upper) and inferior (lower) portions

- **Lines:** is the margin of Plains.


Frontal plane
Median (midsagittal) plane
Transverse plane
(a) Frontal section through torso
(b) Transverse section through torso (superior view)
(c) Median (midsagittal) section

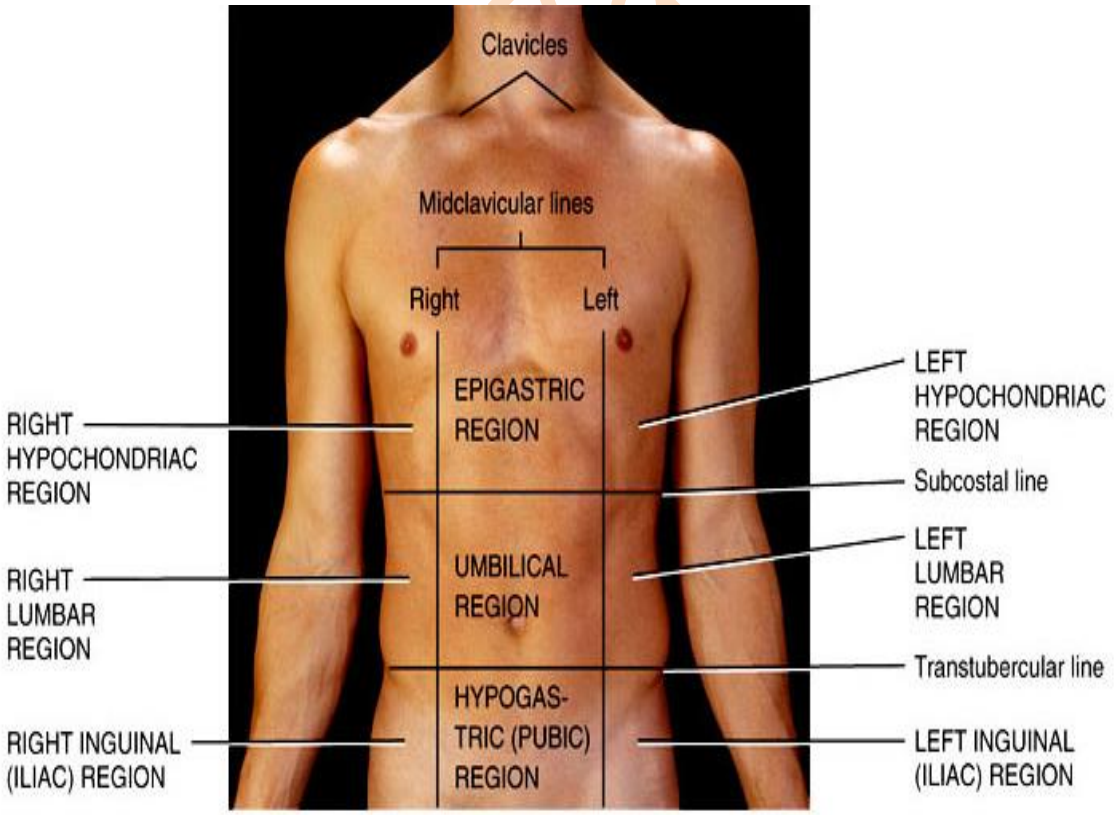

Transverse plane
View
Frontal plane
View
(c) Midsagittal plane
View

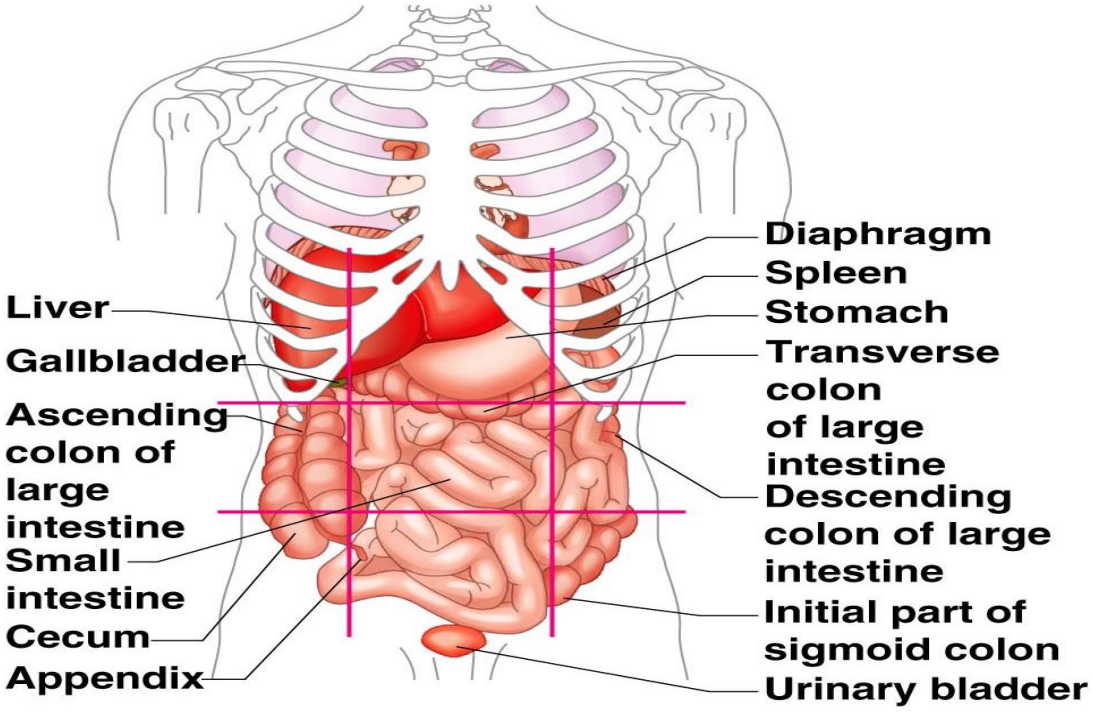
Abdominal Regions and Quadrants

The abdominal regions or areas of the abdomen according to the surface anatomy: -

These areas described on the surface of the abdomen resulting from crossing of the imaginary vertical and horizontal lines with each other that dividing the abdomen into nine areas or regions: -

1. **The right hypochondrial region:** contain right of liver, right kidney.
2. **The left hypochondrial region:** spleen, left kidney.
3. **The epigastric region:** pancreas, stomach, liver, duodenum.
4. **The right lumber region:** part of large intestine, right kidney.
5. **The left lumber region:** part of large and small intestine, left kidney.
6. **The umbilical region:** part of small and large intestine.
7. **The hypo gastric region:** urinary bladder, ureters, part of small intestine.
8. **The right iliac (inguinal) region:** part of small and large intestine.
9. **The left iliac (inguinal) region:** part of small and large intestine.

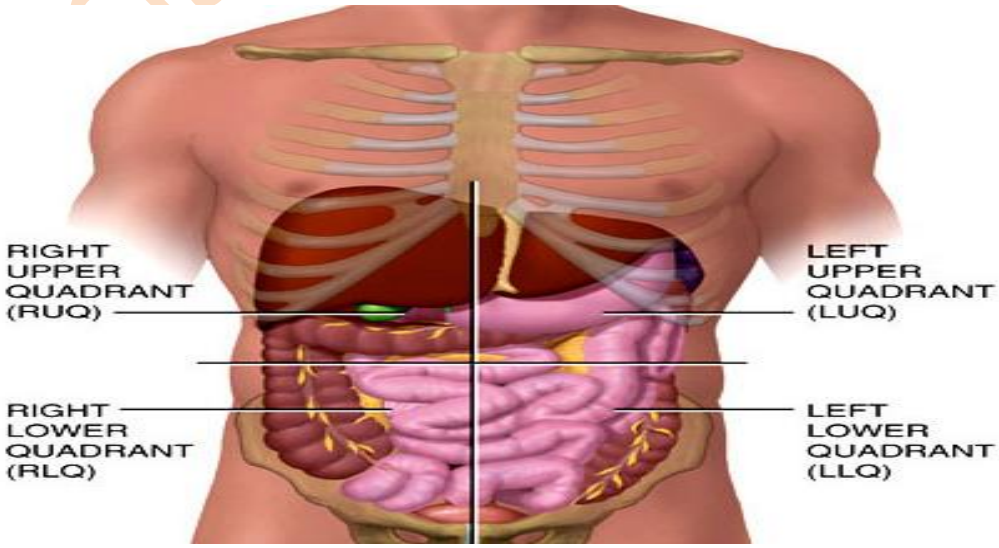




Abdominal Quadrants: -

Vertical and horizontal lines pass through the umbilicus which divide the abdomen into four quadrants (Abdominal quadrants).

1. Right upper quadrant (RUQ)
2. Left upper quadrant (LUQ)
3. Right lower quadrant (RLQ)
4. Left lower quadrants (LLQ)



Quiz / 3

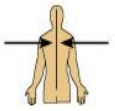
Enumerate the Plains of the anatomy.

Note: -

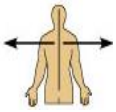
-Check your answers in key answer page at the ending of this modular unit.

Directions and relative positions: -

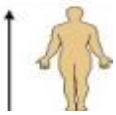
- **Medial:** is the nearest part to the medial plain.



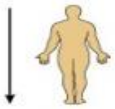
- **Lateral**: is the farthest part to the medial plain.



- **Superior**: is the nearest part to the head (upper).



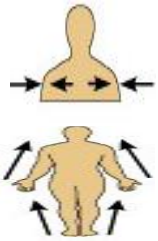
- **Inferior:** is the farthest part to the head (lower).



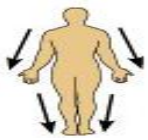
- **Internal:** inside the body cavity mean the site of some structures or organs to the body cavity (inner).

- **External**: the site of some structures or organs to the body surface (outer).

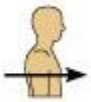
- **Proximal:** it is mean the nearest to the connection of the extremity to the trunk.



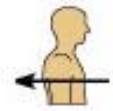
- **Distal**: It is mean the farthest to the connection of the extremity to the trunk.

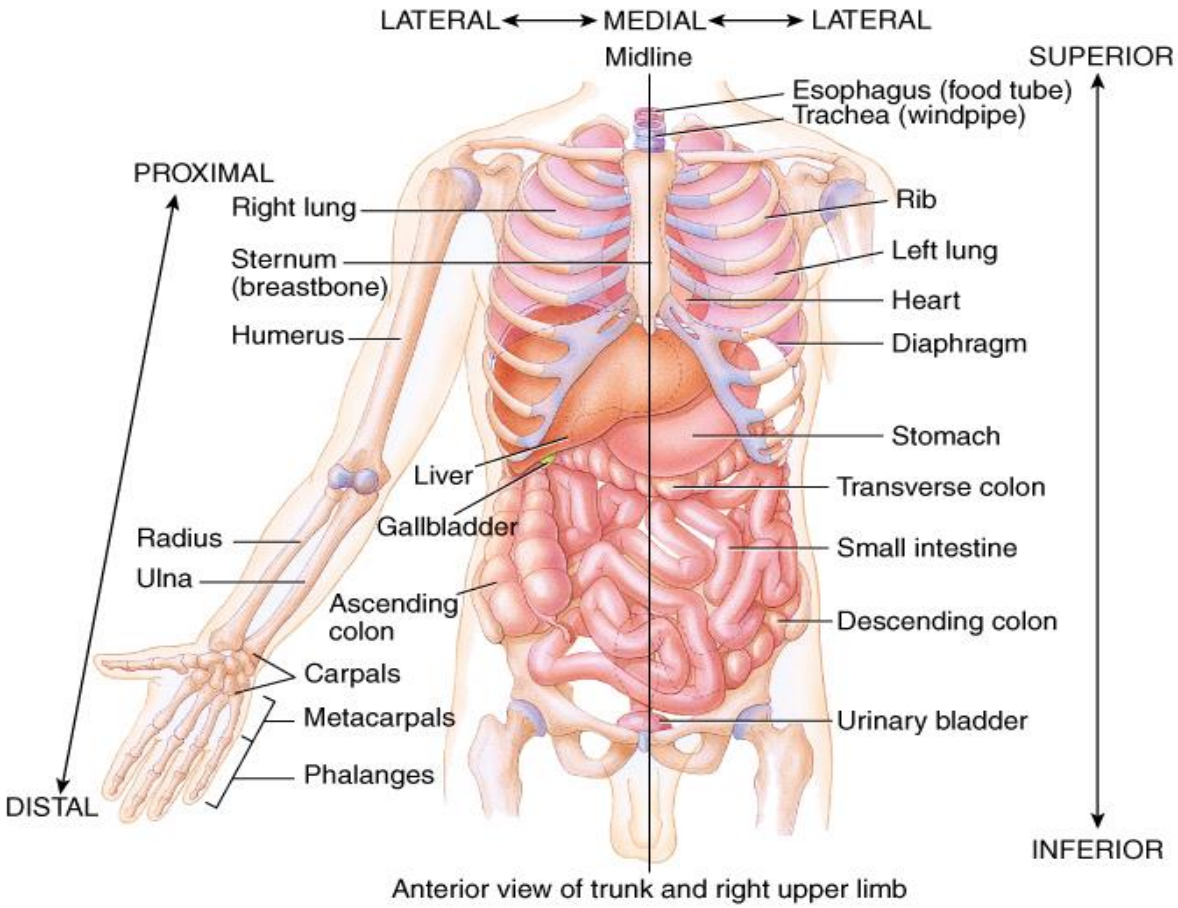


- **Anterior:** It is in front of the body also called ventral.



- **Posterior:** It is the back of the body also called dorsal.





Anterior view of trunk and right upper limb

Quiz / 4

Answer with true or false: -

Proximal: it is mean the nearest to the connection of the extremity to the trunk.

Inferior: is the farthest parts to the head (upper).

Note: -

-Check your answers in key answer page at the ending of this modular unit.

Quiz / 5
Complete the following statements with correct words:-
The left lumber region contain: ……. ,……. ,…….. .

Note:-
-Check your answers in key answer page at the ending of this modular unit.

5/post test

Circle the correct answer of the following: -
1. Methods of study anatomy: -

a. Systemic method and living.
b. Topographic method.
c. Living or Dynamic method.
d. Systemic method, Topographic method, and living.

2. Anterior: is the front of the body also called: -
a. Distal.
b. dorsal.
c. ventral.
d. inner.

3. The hypo gastric region contain: -

a. Liver, ureters and kidney.
b. urinary bladder, kidney, part of small intestine
c. urinary bladder, ureters, part of small intestine
d. urinary bladder, ureters and liver.
4. Sagittal plane contain: -
a. Parasagittal, subcostal and Inter–tubercular plane.
b. Midsagittal and Parasagittal plane.
c. Midsagittal, Parasagittal ,subcostal and Inter–tubercular plane.
d. Midsagittal, subcostal and Inter–tubercular.

5. The areas of the abdomen according to the surface anatomy dividing in to: -
a. Five areas.
b. Nine areas.
c. Seven areas.
d. Eight areas.

Note: -
-Check your answers in key answer page at the ending of this modular unit.
- (2) degree for each.

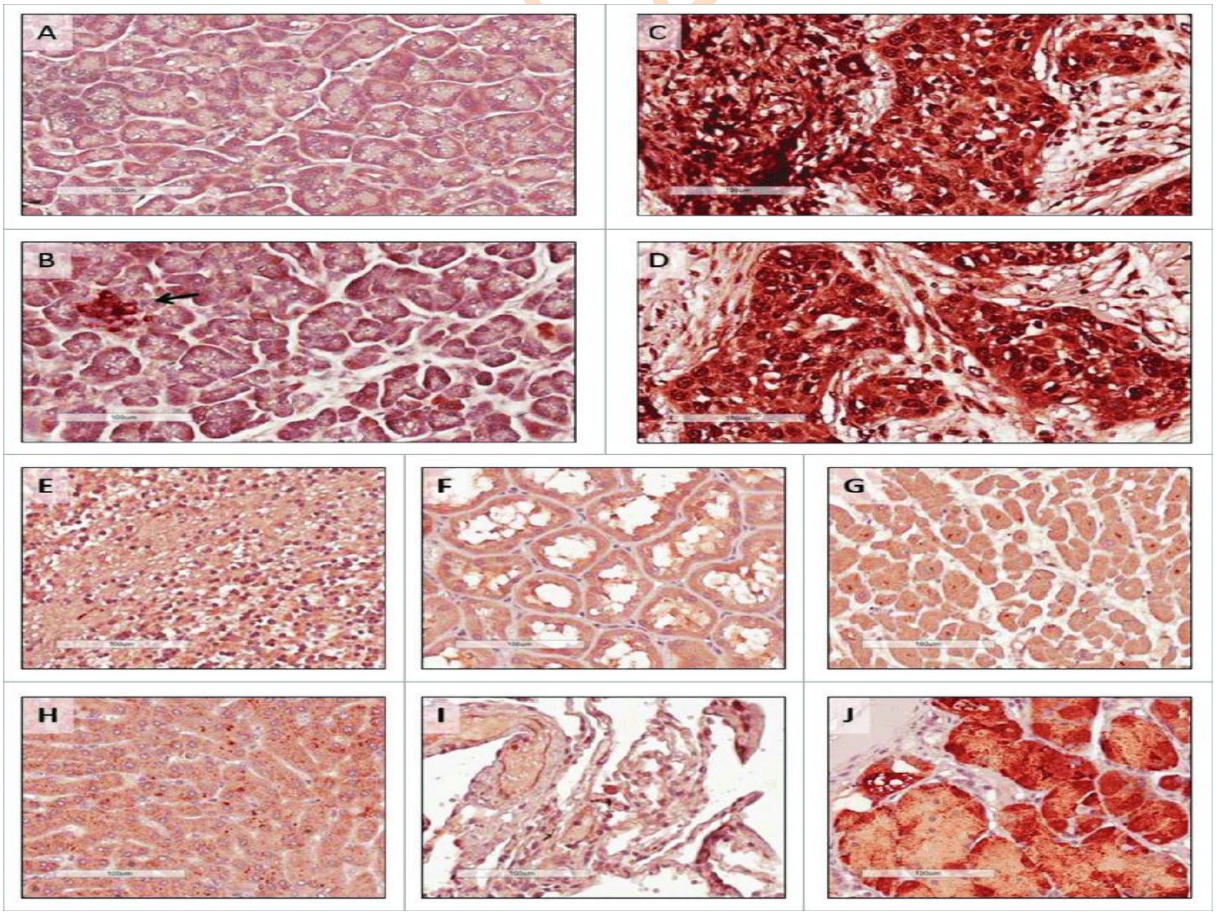
6/ Key answer

Pre test		Post test
1. a.	Quiz / 1 see page no. 6.	1. d.
2.c.	Quiz / 2 see page no. 6.	2.b.
3. c.	Quiz / 3 see page no. 7.	3. c.
4. a.	Quiz / 4 see page no. 8,9.	4. b.
5.d.	Quiz / 5 see page no. 10.	5.b.
6.b.		
7.a.		
8. a.		
9. d.		
10.a.		

If you :-
***Got 9 or more you do not need to proceed.**
***Got less than 9you have to study this modular unit very well.**

The second modular unit

Cell and Tissues



1 / over view

1/A-Target population: -

This unit Learning package had been designed to the first class students in the community health Dept. KARBALA institute Technology.

1/B-Rationale: -

Cell array out all chemical activities needed to sustain life and building blocks of all living things. Tissues are groups of cells that are similar in structure and function. An aggregation of cells and cell products of similar structure and embryonic origin that perform a common function.

1/C-Central Idea: -

1- Definition of the cell.
2- Types of tissues.
3- Types of Epithelium tissue.
4- Types of Connective tissue.
5- Types of Muscular tissue.
6- Types of Nervous tissue.

1/D-Instructions: -

1- Study over view thoroughly.
2-Determine the performance objectives.
3-Do the pretest and if you have: -
A-Got 9 or more you do not need to proceed.
B-Got less than 9you have to study this modular unit very well.
4-After studying the text of this modular unit, do the post test, and if you have: -
A-Got 9 or more, go to the second modular unit.
B-Got less than 9, go back and return to study this modular unit; or any part of it; and then return to perform the posttest again.

2/performance objectives :-

After studying this modular unit, the student will be capable to:
1-Define the cell and tissue.
2-Know the type of tissues.
3- Divided the epithelium tissue.
4- Divided the connective tissue.
5- Named of muscular tissue.
7- Mention types of nervous tissue.

3/pre test :-

Circle the correct answer of the following: -

1- The structure of cell that responsible for digested the organic substance is: -

a- Golgi apparatus.
b- Mitochondria.
c- Centrosomes.
d- Lysosome.

2- All types of cells have centrosomes except the: -

a- Red blood cell.
b- Epithelium.
c- Muscular cell.
d- Never cell.

3- Simple squamous epithelium tissue found in: -

a- kidney.
b- Liver.
c- Stomach.
d- Pulmonary alveoli.

4- transitional epithelium lining the: -

a- Glands.
b- Endocardium.
C- Blood vessels.
d- Urinary bladder.

5- Elastic cartilage: found in the: -

a- Eustachian tube.
b- Articular surface of bones and ribs.
c- Inter- vertebral disc.
d- Pubic symphysis.

6- In voluntary also called: -
a- Smooth muscles.
b- Skeletal muscles.
c- Striated muscles.
d- Cardiac muscles.

7- Red color of muscles differs according to the: -

a- Type, function and movement of the muscle.
b- Type and function of the muscle.
c- Function and movement of the muscle.
d- Movement and type of the muscle.

8- Types of bony tissue: -

a- Cancellous bone and spongy bone.
b- Cancellous and Compact bone.
c- Spongy and osteocytes bone).
d- Compact, osteocytes and cancellous bone.

9- The axon transmits the nerve impulse from the cell body to:-

a- The tissue and lymph.
b- The other cell and blood.
c- The blood or tissue.
d- The other cell or tissue.

10- Myelinated nerve fibers: -
a- Nerve cell covered by myelin sheath.
b- Nerve cell uncovered by myelin sheath.
c- Nerve fibers uncovered by myelin sheath.
d- Nerve fibers covered by myelin sheath.

Note: -
-Check your answers in key answer page at the ending of this modular unit.
- (1) degree for each.

4/ the text:-

Cell and Tissues

Cell: It is the smallest structural unit of the animal kingdom or plant kingdom. The cells are not in one shape but it presented in different shape depending on the function, some of them cylinder, cubic, star –shape, spindle, or irregular in shape. Also the cell has different size from (5-50) micrometer in diameter.

Microscopical structures of the cell :-

Every cell surrounded by cell membrane which contains protoplasm that divided into two parts **cytoplasm and nucleus**.

I. Cell membrane: it contains 3 layers: **outer** and **inner** layer and between them **middle** layer.

II. Cytoplasm: it located inside Cell membrane and surrounds the nucleus. In the cytoplasm there are different organelles:

1. **Mitochondria:** Is small oval organelle consider as respiratory organelle and share in energy production.

2. Golgi apparatus: it located near nucleus which has important role in secretary activities such as collection of enzymes and secretary granules.

3. Lysosome: small spherical organelle responsible for digested the organic substance.

4. Endoplasmic reticulum: net of tubules found in cytoplasm, there are two types:

a. Rough endoplasmic reticulum: which contain ribosomes that responsible for protein synthesis.

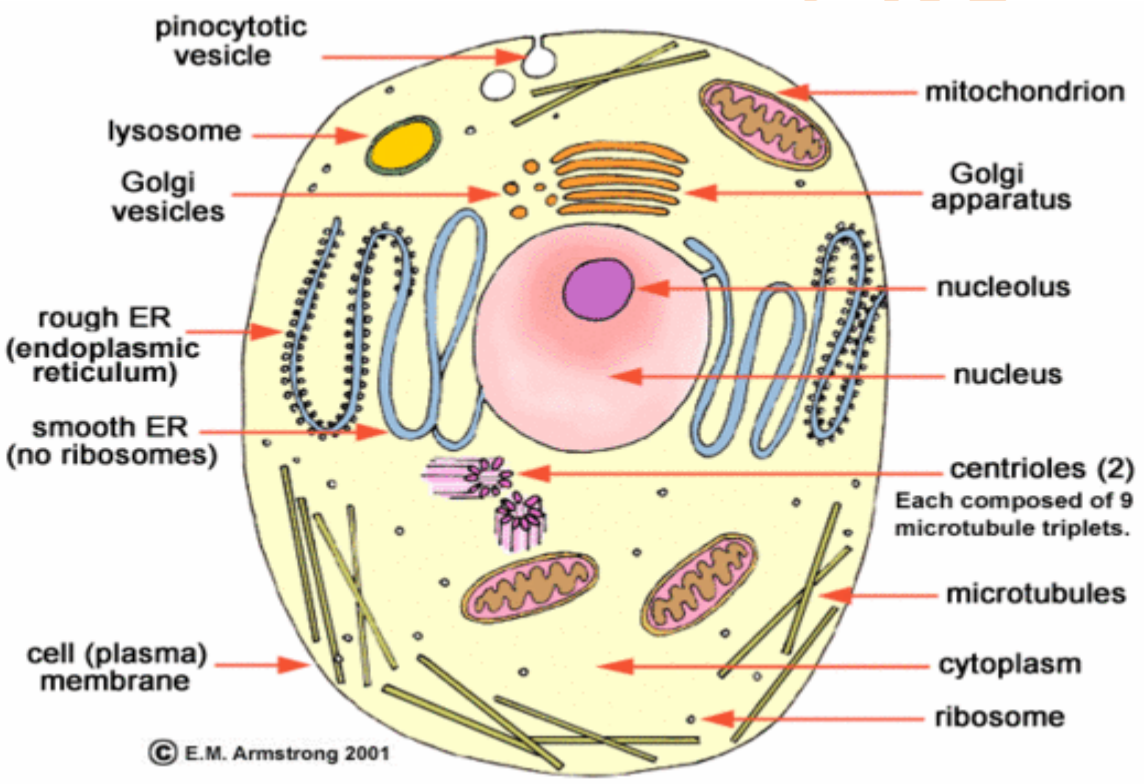
b. Smooth endoplasmic reticulum: which are smooth tubules (absence of ribosomes).

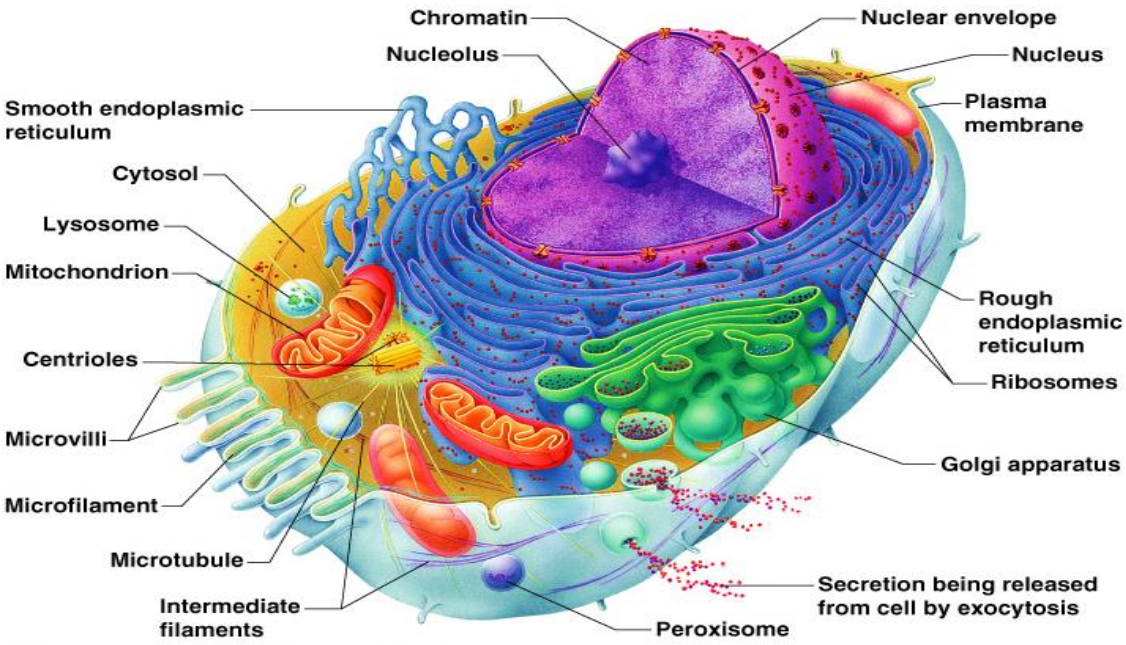
5. Centrosomes: lies near nucleus important in process of cell found in all types of cell except the nerve cell.

III. Nucleus: It considered the important organ for the cell life, growth, control and organizes the cell function. It ranges from (4-10) micrometer. It has spherical, oval, or beans shape. Most of cells have one nucleus and other has two or more or no nucleus.

-Nucleus has: a. nuclear membrane**.** **b**. nucleolus. **c.** nucleoplasm. **d.** chromatin.

In the mitosis process each chromatin divided into chromosomes which arranged in 23 pairs (46 chromosomes) and responsible of transmission the hereditary character.





Quiz / 1
Define the cell and tissue.

Quiz / 2
Enumerate the microscopical structure of the cell.

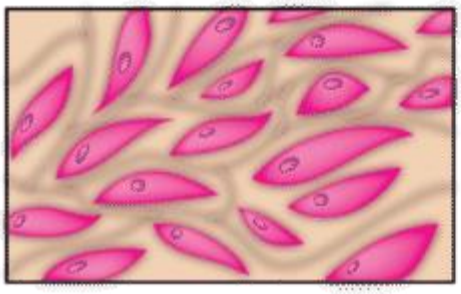
Quiz / 3
Explain Endoplasmic reticulum.

Note: -
-Check your answers in key answer page at the ending of this modular unit.

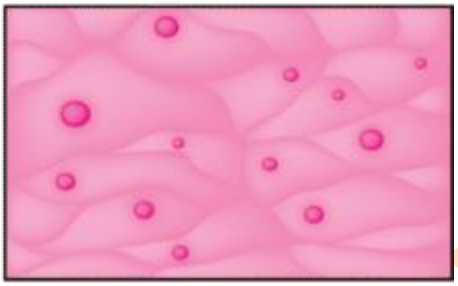
Tissues: are numbers of cells having the same shape and function.

- Different type of tissue form organs like liver and kidney.
- Organs collect form system like respiratory system.

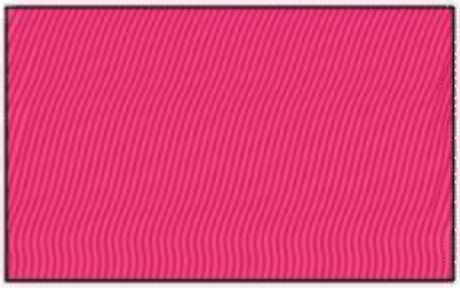
Four Types of Tissues



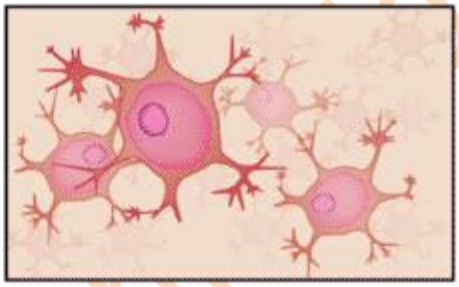
Connective tissue



Epithelial tissue



Muscle tissue



Nervous tissue

Types of tissues:

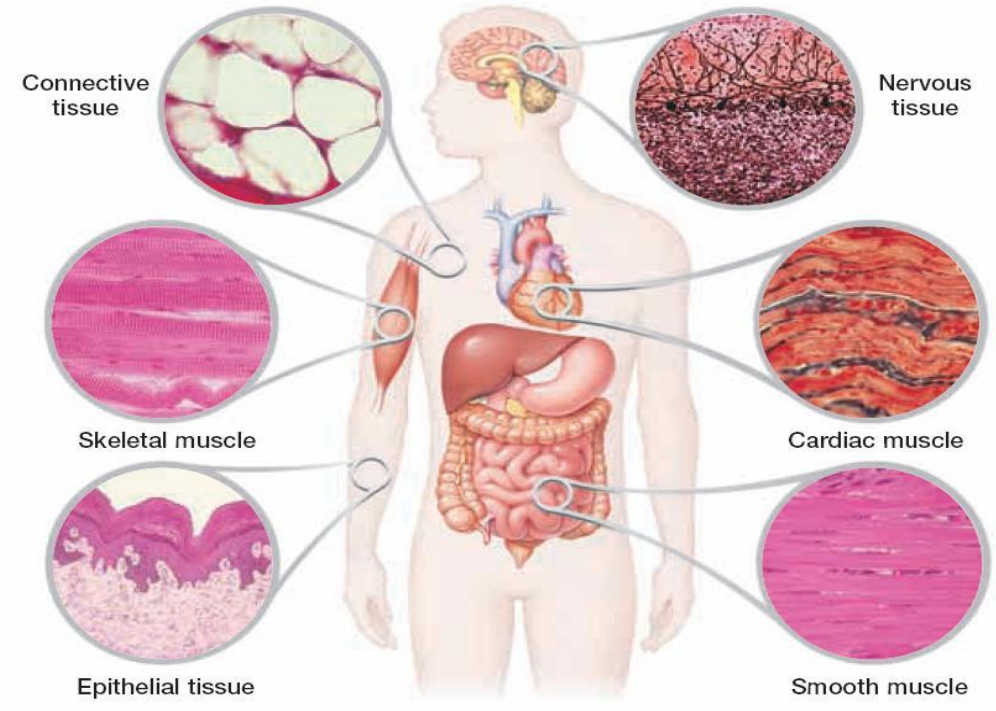
i. Epithelium.

ii. Connective tissue.

iii. Muscular tissue.

iv. Nervous tissue.

Human Body Tissues



I. Epithelium: The epithelium tissue either encapsulates a surface or lining cavities. There are two types of it:-

1-membranous epithelia: form the coverings or linings of organs.

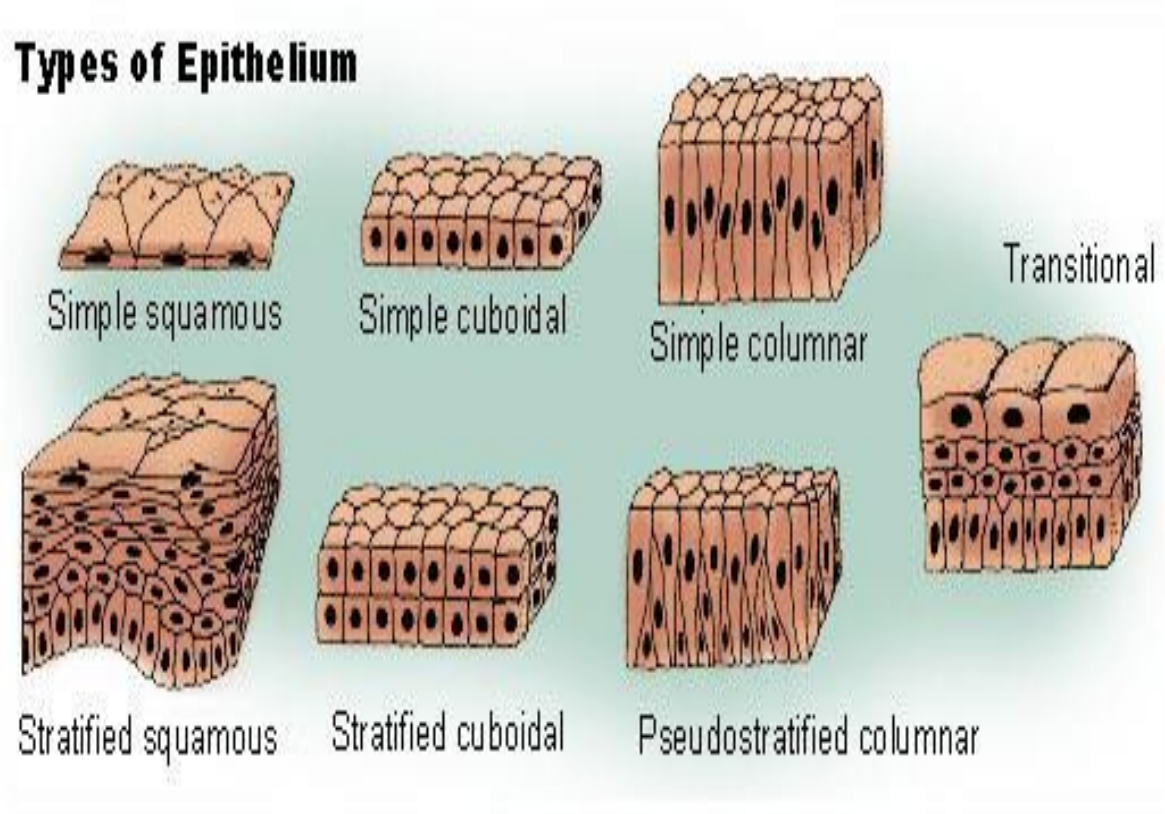
2-glandular epithelia: form exocrine and endocrine glands.

The epithelium is made up of compact cells that combine with each other in different layers. The difference is due to the different function of each epithelium. The epithelium is separated from the other tissues of the body by a thin membrane of the connective tissue called the basement membrane.

The basement membrane very important because it is work to support the epithelium and give it its shape.

The epithelium is usually divided into two types depending on the number of layers it contains two types: -

1- **Simple epithelium:** containing a single layer of cells.
2- **Stratified epithelium:** containing two or more layers of cells.



II. Connective tissue:

Binds the cells and organs of the body together

- **All connective tissues consist of two basic components: cells and extracellular fibers.**
- **There are two types of connective tissues are: -**

1- Connective tissue proper. It consists of two types:

a- Dense connective tissue.

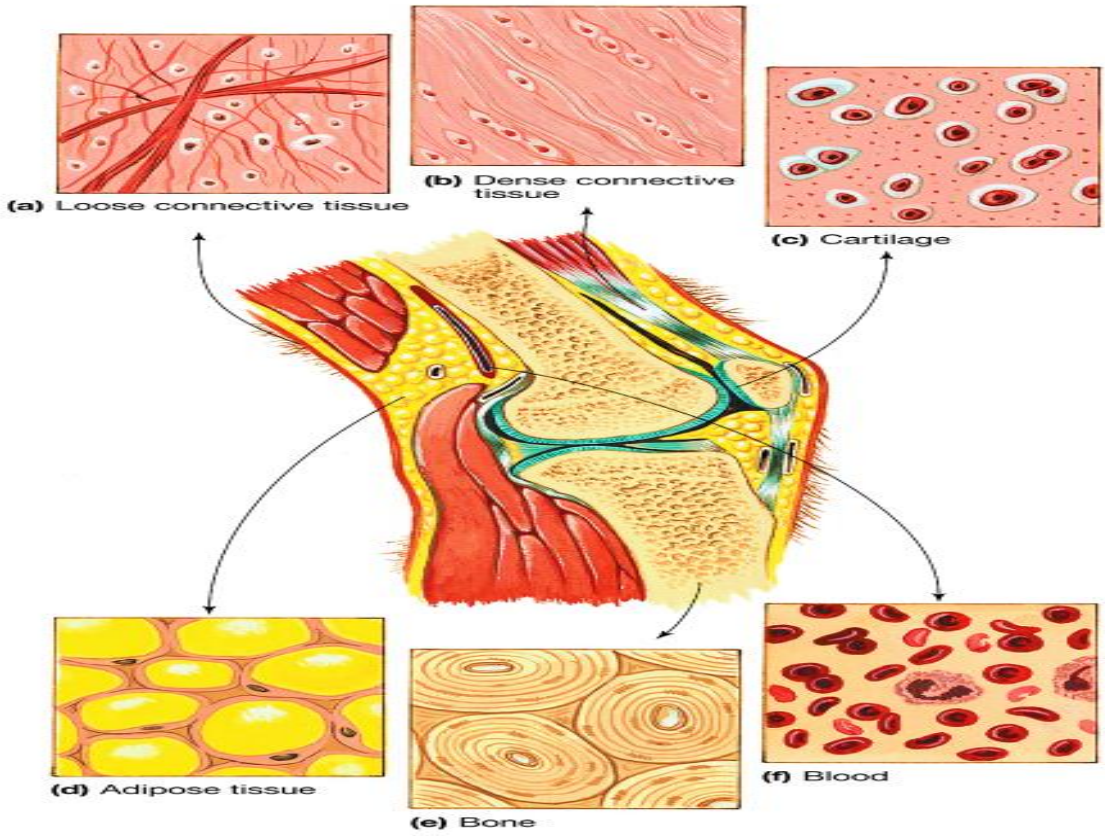
b- Loose connective tissue.

2- Specialized connective tissue. Perform specific functions essential to homeostasis. The body contains three types of specialized connective tissue:

A-Cartilage :(1. Hyaline cartilage. 2. Elastic cartilage. 3. Fibrocartilage.

B-Bone: (1. Compact bone. 2. Cancellous bone (spongy bone).

C-Blood.



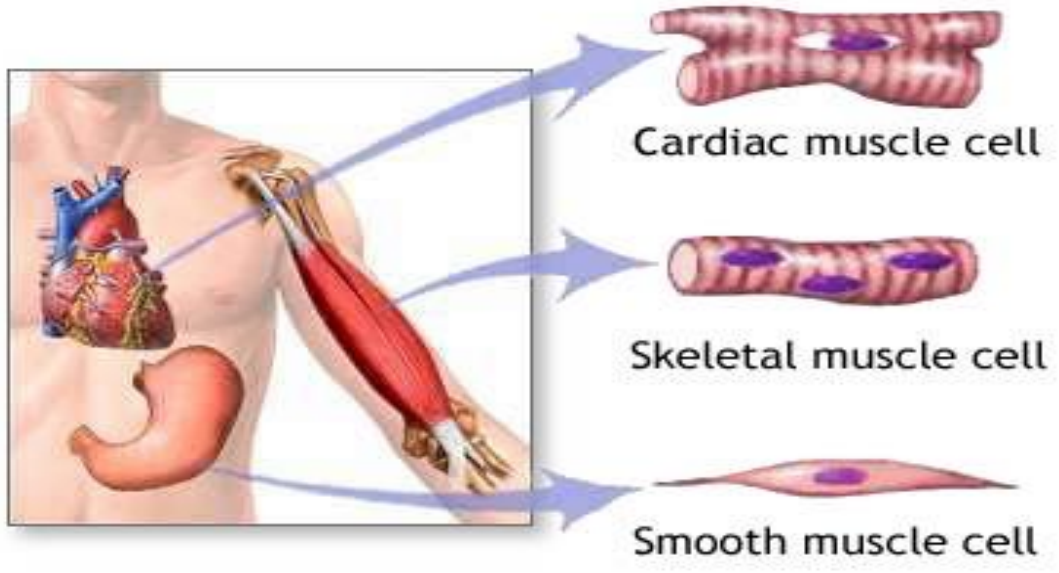
Quiz / 4
Enumerate types of tissues.

Quiz / 5
Mention types of supportive connective tissue.

Note: -
-Check your answers in key answer page at the ending of this modular unit.

III. Muscular tissue: Consists of specialized cells that contract when stimulated. The body has three types of muscular tissue:

1- Skeletal (voluntary).
2- Cardiac (involuntary).
3- Smooth muscle (involuntary).



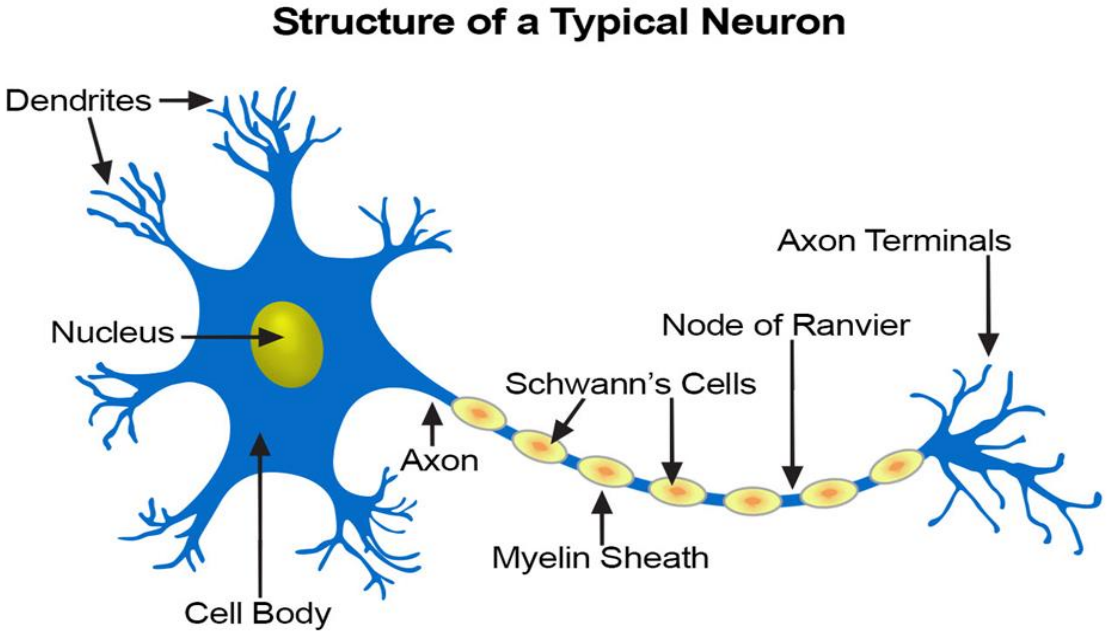
IV. Nervous tissue: This tissue consists of cells called nerve cell and its processes. It is specialized cells that conduct impulses.

Nerve fibers: -

It is consisting of one axon covered by the sheath. There are two types: -

1-Myelinated nerve fibers: nerve fibers covered by myelin sheath.

2-Un Myelinated nerve fibers: nerve fibers don't cover by myelin sheath.



Quiz / 6
Enumerate types of the muscles.

Quiz /7
Complete the following statements with correct words:-
Nerve cell: consists of ……..., …… and…… .

Quiz / 8
Mention types of nerve fibers.

Note: -
-Check your answers in key answer page at the ending of this modular unit.

5/post test

Answer with true (T) or false (f) for each of the following statements: -

1-The cell have different size from (5-50) micrometer in diameter.
2-Golgi apparatus has important role in secretary activities such as collection of enzymes and secretary granules.
3-Organs collect form tissues like respiratory system.
4- Example of the simple columnar epithelium tissues lining most of the internal wall of Glands.
5-Connective tissue fills the spaces between the organs and supports them.
6- Three types of cartilage are hyaline, elastic and fibrocartilage.
7- Periosteum is covering the bone and consists of two layers outer and inner layer.
8- Smooth muscles cover the skeleton so it is called skeletal muscles.
9-Nervous tissue consists of cells called nerve cell and its processes.
10- Un Myelinated nerve fibers: nerve fibers covered by myelin sheath.

Note: -
-Check your answers in key answer page at the ending of this modular unit.
- (1) degree for each.

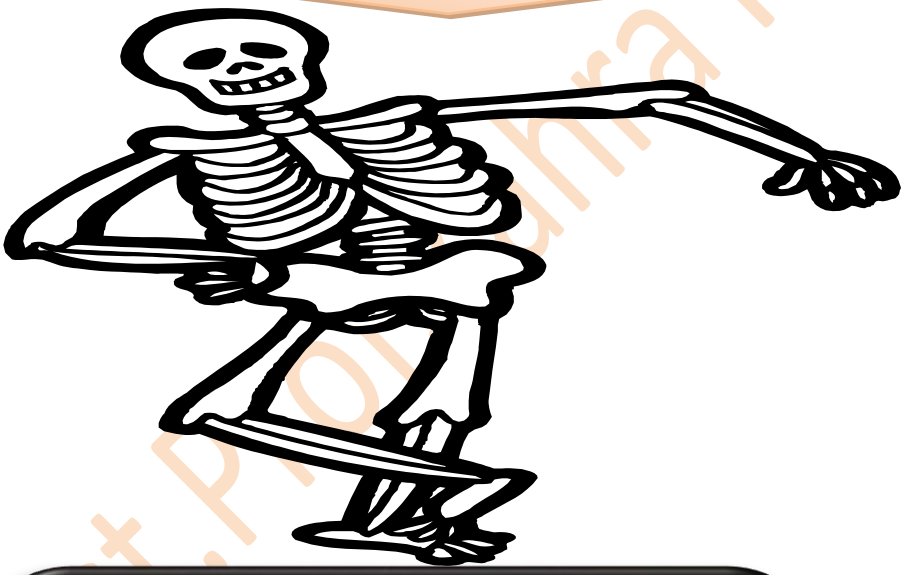
6/ Key answer

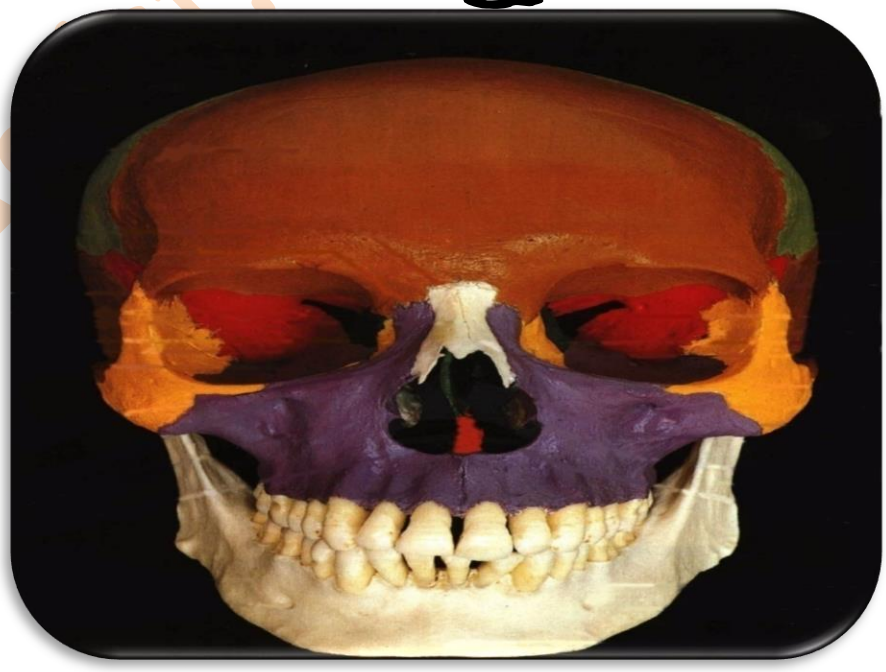
Pre test		Post test
1. d.	Quiz / 1see page no. 17.	1. T.
2.d.	Quiz / 2 see page no. 17.	2T.
3. d.	Quiz / 3 see page no. 17.	3. F.
4. d.	Quiz / 4 see page no. 18.	4. T.
5.a.	Quiz / 5 see page no. 19.	5.T.
6.a.	Quiz / 6 see page no. 21,22.	6.T.
7.b.	Quiz / 7 see page no. 21.	7.T.
8. b.	Quiz / 8 see page no. 22.	8.F.
9. d.	Quiz / 9 see page no. 22.	9.T.
10.d.		10.F.

If you: -
***Got 9 or more you do not need to proceed.**
***Got less than 9you have to study this modular unit very well.**

The third modular unit

Bones and the Skeleton





1 / over view

1/A-Target population: -

This unit Learning package had been designed to the first class students in the community health Dept. KARBALA institute Technology.

1/B-Rationale: -

Bones form the skeleton of the body that consist of a lot of bones (206) that attached to each other and arranged in a way that give the body standing position on the feet and easy distribution of the weight body on the feet.

The bones of the skeleton differs in the shape and long according to the function and may arranged to form cavities to protect the important organs these cavities either semi completely closed as in the skull or incompletely closed as in vertebral canal or open cavity as in thoracic cavity .

1/C-Central Idea: -

1- Bone definition.
2- Types of bones.
3- Types of Bone Cells.
4- The Skeleton of the upper limb.
5- The Skeleton of the lower limb.
6- The Skeleton of the thorax.
7- The Skeleton of the head.
8- The Skeleton of the vertebral column.

1/D-Instructions: -

1- Study over view thoroughly.
2-Determine the performance objectives.
3-Do the pretest and if you have: -
A-Got 9 or more you do not need to proceed.
B-Got less than 9you have to study this modular unit very well.
4-After studying the text of this modular unit, do the post test, and if you have: -
A-Got 9 or more, go to the second modular unit.
B-Got less than 9, go back and return to study this modular unit; or any part of it; and then return to perform the posttest again.

2/performance objectives :-

After studying this modular unit, the student will be capable to:
1- Definition of the bone.
2-Know types of bones.
3-Mention types of bone cells.
4- Divided the bone of the skeleton of upper limb.
5- Divided the bone of the skeleton of lower limb.
6-Determine the Skeleton of the thorax.
7- Explain Skeleton of the head.
8- Divided the Skeleton of the vertebral column.
9- Named of the vertebra.

3/pre test :-

Answer with true (T) or false (f) for each of the following statements: -
1- Long bones characterized by its long that does its function in movement.
2- One function of bones is production of RBC.
3- In embryos, the skeleton is primarily hyaline cartilage.
4- Skeleton of the forearm contains one bone humerus.
5- Skeleton of the leg have two bones radius and ulna.
6- False non floating ribs they are (11th, 12th) ribs which not attached to anything so it floating.
7- Sacral region: consists of (4) sacral vertebrae.
8- Axis: it is the first cervical vertebrae.
9- Sagittal suture situated between the parietal bones and frontal bone.
10- Foramen magnum is the smallest foramen in the skull and important because the spinal cord pass through it.

Note: -
-Check your answers in key answer page at the ending of this modular unit.
- (1) degree for each.

4/ the text:-

Bones of the Human Body

The skeleton of the body consists of a lot of bones. In adult about (206) bones that attached to each other and arranged in a way that give the body standing position on the feet and easy distribution of the body weight on the feet.

The bones of the skeleton differs in the shape and long according to the function and may arranged to form cavities to protect the important organs these cavities either semi completely closed as in the skull or incompletely closed as in vertebral canal or open cavity as in thoracic cavity.

Classification of Bones on the Basis of Shape

1. Long bones: -

-It characterized by its long that does its function in movement.
-It has body and two ends, the body (shaft) like: femur, humerus.

2. Short bones: -

It characterized by its force and short movement like: carpal bone, tarsal bone.

3. Flat bones: -

These bones have wide surface area on both sides like: scapula, bones of the skull and sternum.

4. Irregular bones: -

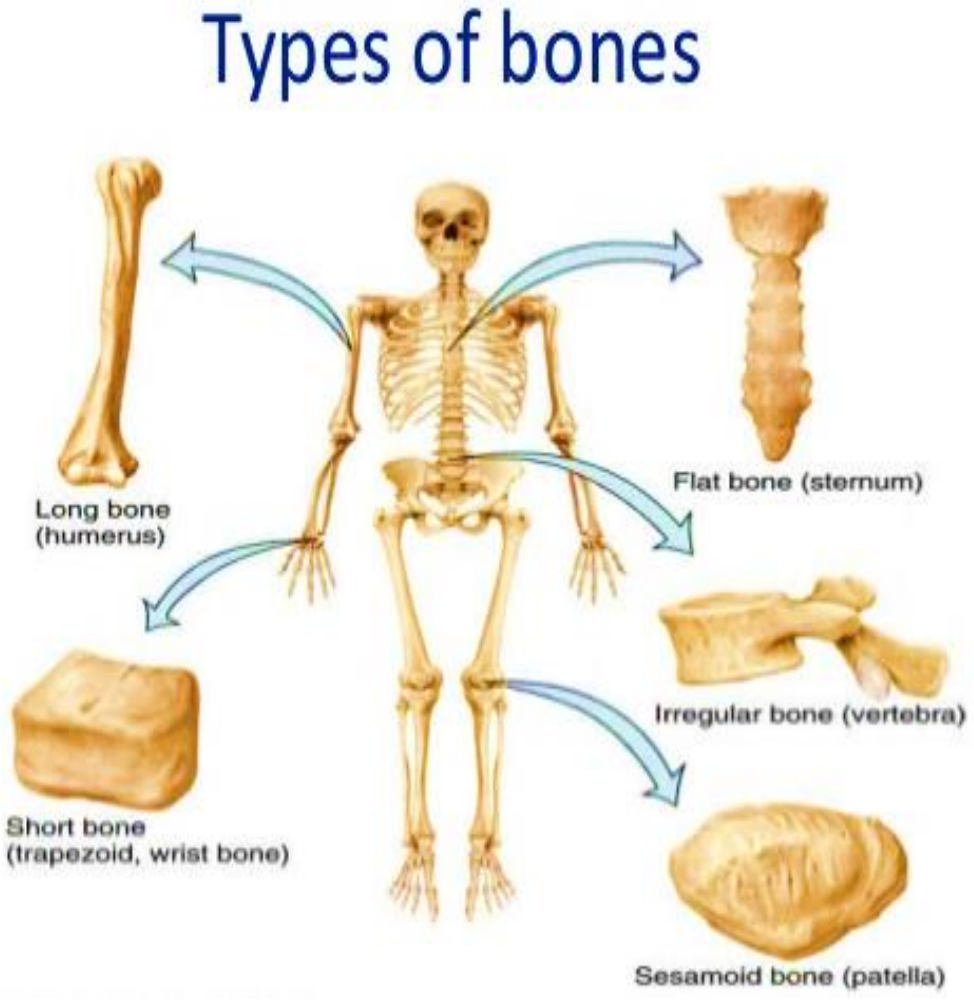
It has irregular in shape like: vertebrae.

5. Pneumatic bones: -

These bones contain sinus filled with air like: maxillary sinus in the skull.

6. Sesamoid bones: -

They are small bones like: patella.


Types of bones
Long bone
(humerus)
Flat bone (sternum)
Irregular bone (vertebra)
Short bone
(trapezoid, wrist bone)
Sesamoid bone (patella)

General functions of bones: -

1. The bone gives the body central axis help in standing the body.
2. The bones arranged with each other to give the shape of the body.
3. Protection of the important organ.
4. Help in body movement.
5. Give the origin and insertion of the skeletal muscles.
6. Holding the body weight.
7. Production of RBC.
8. Store a lot of calcium.

Types of the bone cells: -

1-Osteocytes: Mature bone cells.
2-Osteoblasts: Bone-forming cells.
3-Osteoclasts: Bone-destroying cells, Break down bone matrix for remodeling and release of calcium**.**

NOT: -
Bone remodeling is a process by both osteoblasts and osteoclasts.

Changes in Skeleton of the Human: -

- In embryos, the skeleton is primarily hyaline cartilage.
- During development, much of this cartilage is replaced by bone.
- Cartilage remains in isolated areas.

1-Bridge of the nose. **2-Parts of ribs.** **3-Joints .**

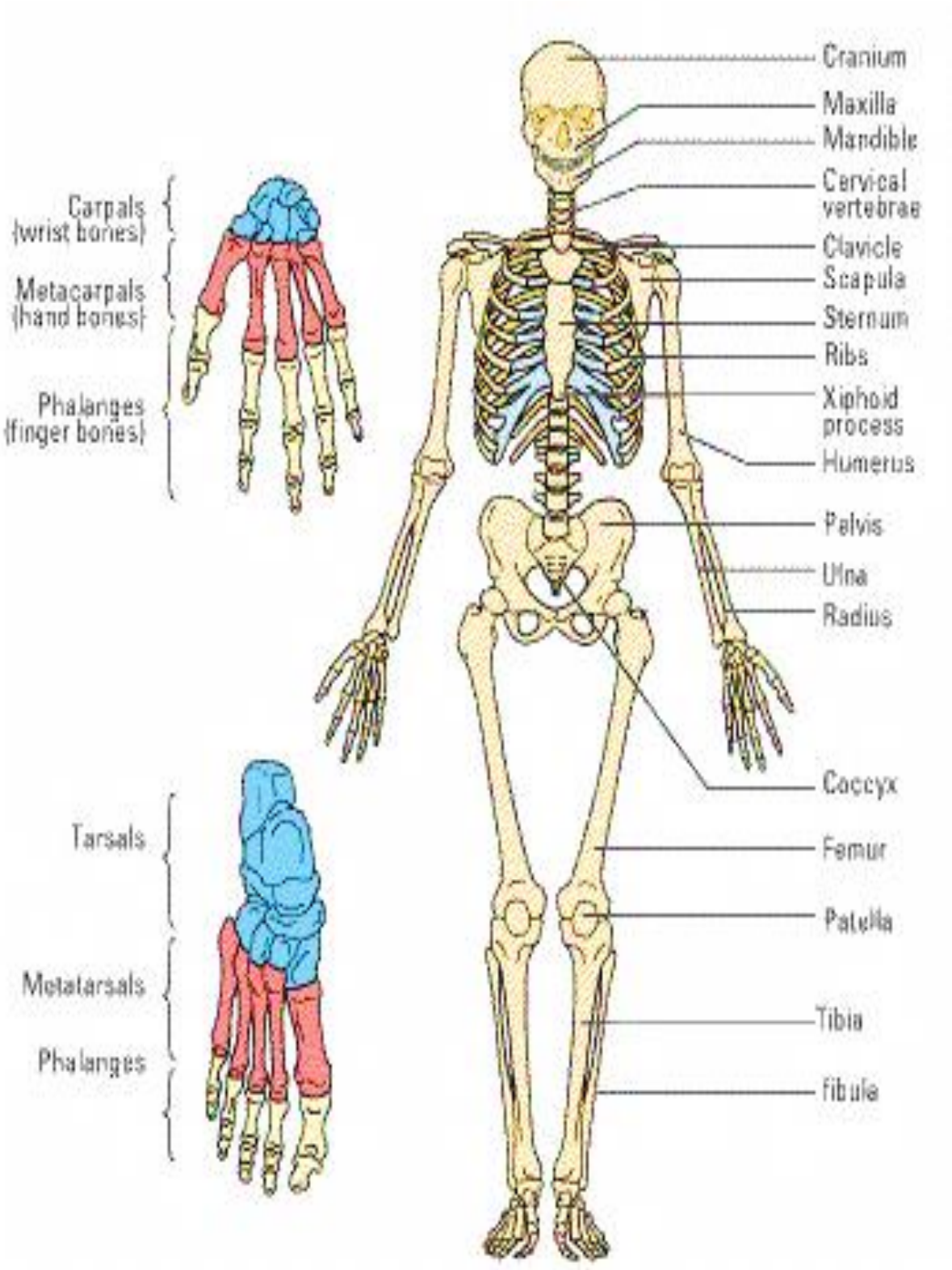
Quiz / 1
Enumerate types of bone according to its shape.

Quiz / 2
Define the long bone.

Quiz / 3
Enumerate the bone cells.

Note: -
-Check your answers in key answer page at the ending of this modular unit.

The Skeleton of Human



Skeleton of upper limb

It consists of: -

1. Skeleton of shoulder girdle contain: -

a. Clavicle.

b. Scapula.

2. Skeleton of upper arm: contain one bone humerus.

3. Skeleton of forearm contain: -

a. Radius.

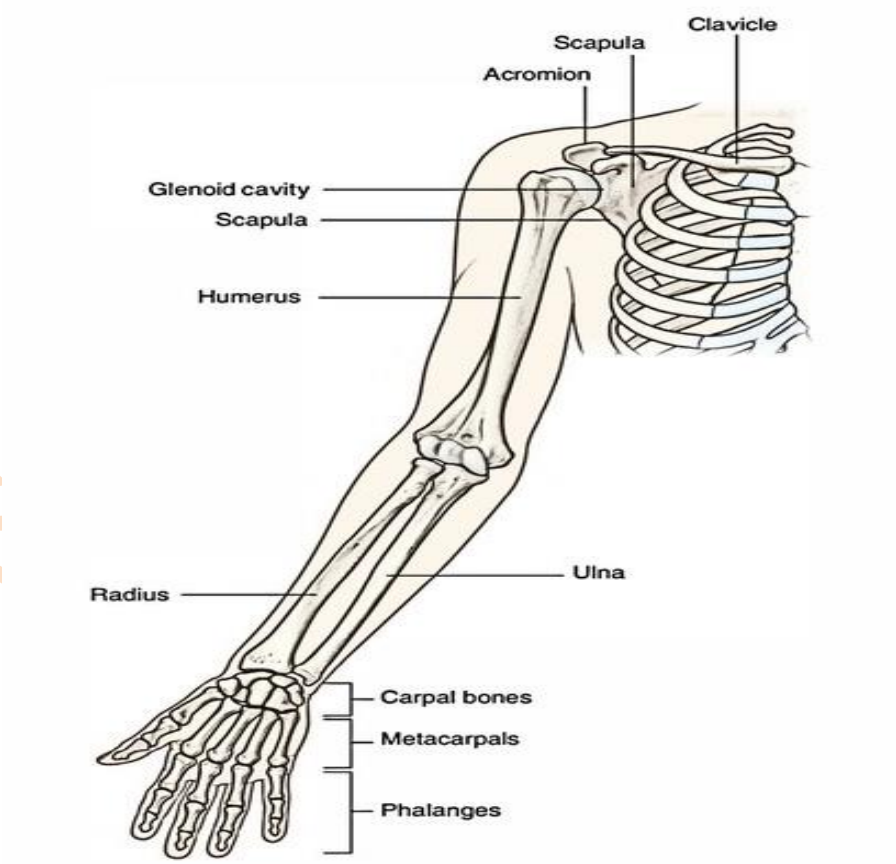
b. Ulna.

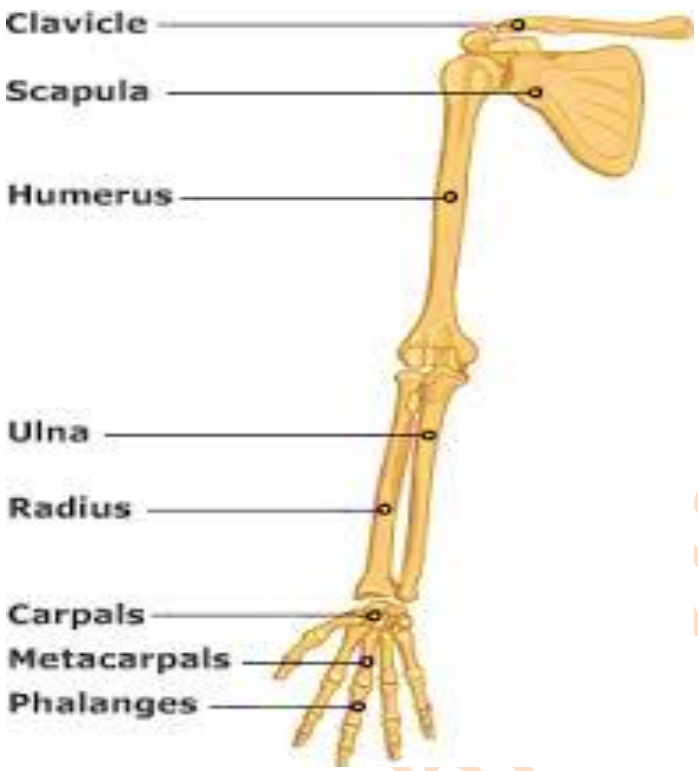
4. Skeleton of hand contain: -

a. Skeleton of wrist: that contains carpal bones.

b. Skeleton of palm: that contains metacarpal bones.

c. Skeleton of fingers: those contain phalanges.





■ Skeleton of the shoulder girdle: -

A-Clavicle: -

- This bone lies in the upper part of the chest horizontally above the first rib.
- There are two one in the right and other in the left.

The ends of clavicle: there are two ends: -

1. Medial end called the sternal end that articulated with sternum
2. Lateral end called acromial end that articulated with the acromial process of scapula.

B. Scapula: -

- Is a large flat bone lies behind the upper part of the back.
-It is triangular in shape its base located superiorly while the apex inferiorly.

The scapula has two surfaces: -

1. Anterior surface called costal surface. (in front of the rib).
2. Posterior surface.

In the superior lateral border of the scapula there is: -

- **Glenoid cavity:** it is a cavity or depression where the head of the humerus articulate in it.

■ Skeleton of upper arm: -

It contains one bone called humerus that is long and strong bone articulated with shoulder girdle at shoulder joint and with fore arm in elbow joint.

■ Skeleton of fore arm:

It consists of two bones radius and ulna which articulated with each other at upper end and lower end, also they articulated with humerus at upper end in elbow joint.

Radius: it is long bone extended on the lateral side of fore arm.

Ulna: it is longer than radius extended on the medial side of fore arm.

■ Skeleton of hand contain: -

A-Skeleton of wrist-

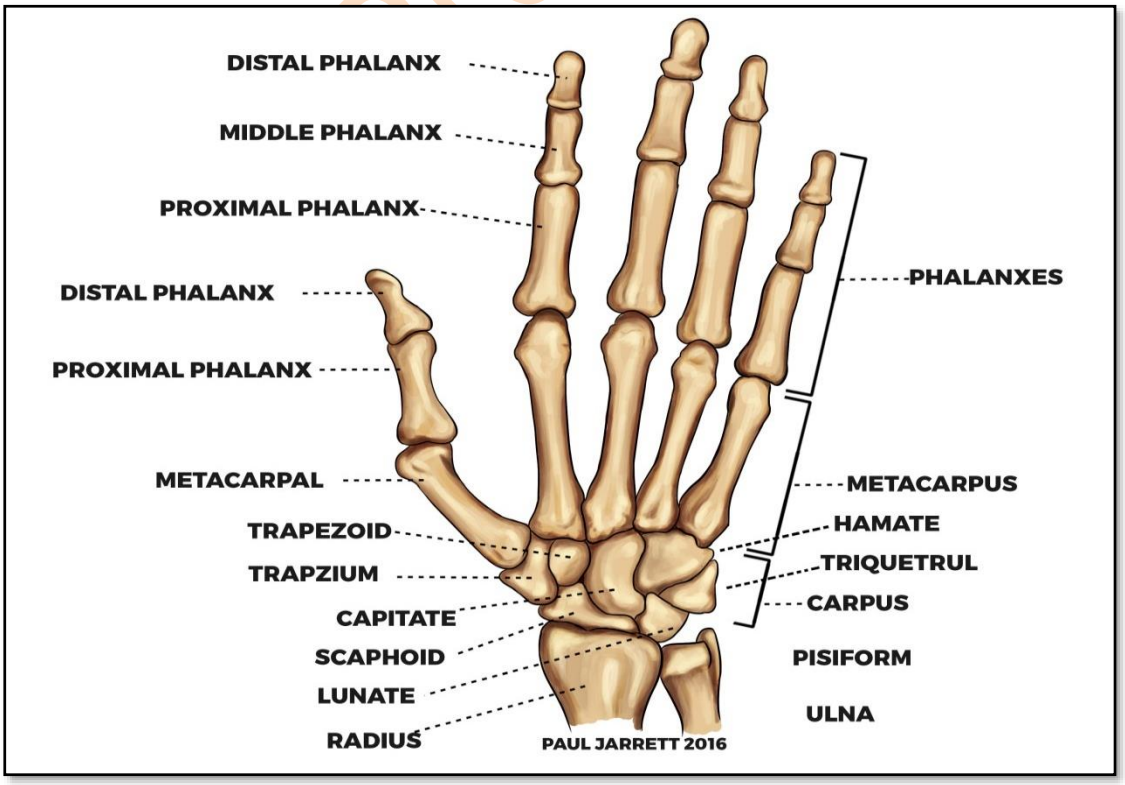
It consists of bones called carpal bones arranged in to two rows: -

1. Proximal row (upper class) 4 bones from lateral to the medial: -

a. Scaphoid bone.
b. Lunate bone.
c. Triquetral bone.
d. Pisiform bone.

2. Distal row (lower class) 4 bones from lateral to the medial: -

a. Trapezium bone.
b. Trapezoid bone.
c. Capitates bone.
d. Hamate bone.



B-Skeleton of palm: -

- It consists of (5) bones called metacarpal bones.
- They are long bone have body and two ends (upper end and lower end).

The upper end articulated with wrist bones and the lower end articulated with phalanges.

C-Skeleton of fingers: -

Each finger has (3) bones called phalanges except the thumb that has (2) bones only.

Each phalange has body and two ends.

The upper phalange called proximal phalange while the lower phalange called distal phalange and the other called middle phalange.

Quiz / 4

Enumerate the Skeleton of hand.

Quiz / 5

Answer with true or false: -

1-Medial end called the sternal end that articulated with sternum.

2- Radius it is longer than radius extended on the medial side of fore arm.

Quiz / 6

Enumerate the distal row or (lower class) of the bones of the wrist from lateral to the medial.

Note: -

-Check your answers in key answer page at the ending of this modular unit.

Skeleton of lower limb

It consists of: -

1. Skeleton of pelvic girdle:

a. Hip bones.

b. Sacrum bone.

2. Skeleton of thigh: contain one bone called femur.

3. Skeleton of the leg: have two bones:

a. Tibia.

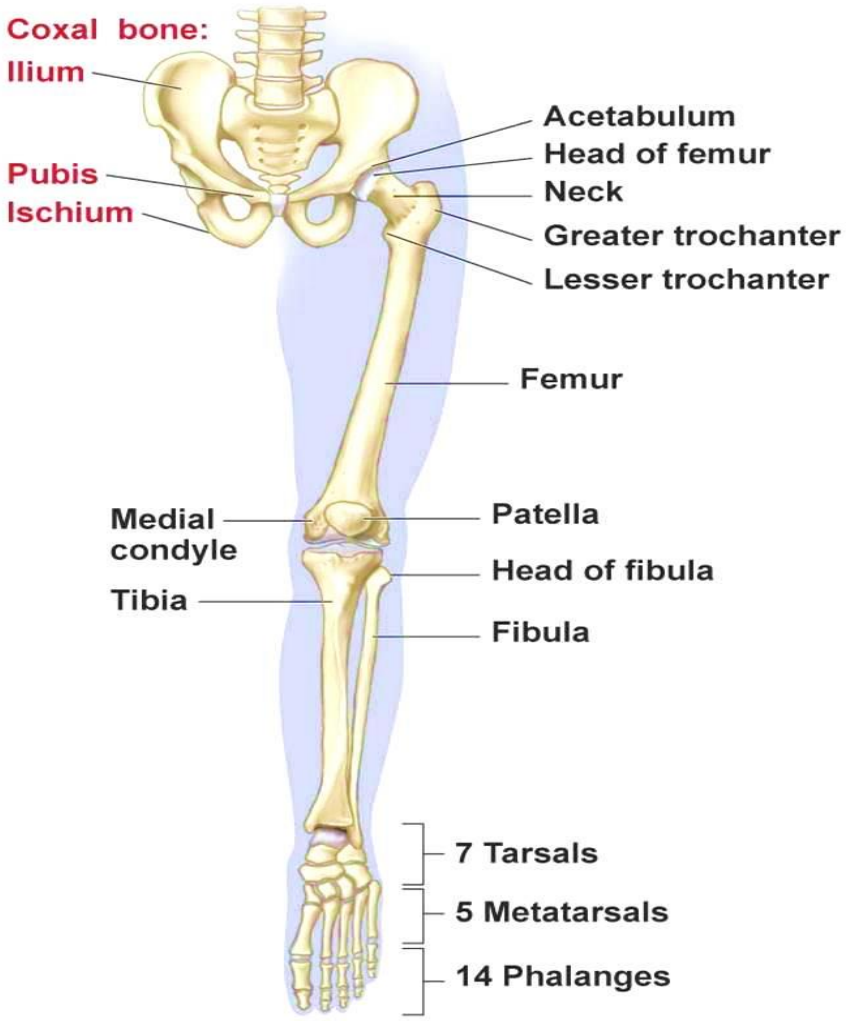
b. Fibula.

4. Skeleton of foot:

a. Skeleton of ankle: that contains tarsal bones.

b. Skeleton of sole: that contains metatarsal bones.

c. Skeleton of toes: Those contain phalanges.



1. Skeleton of pelvic girdle:

- It consists of two hip bones (right and left) and one sacral bone.

The two hip bones articulated with each other anteriorly in pubic symphysis and posteriorly with sacral bone.

Hip bones: They are large irregular bones which consist of three bones that attached to each other: -

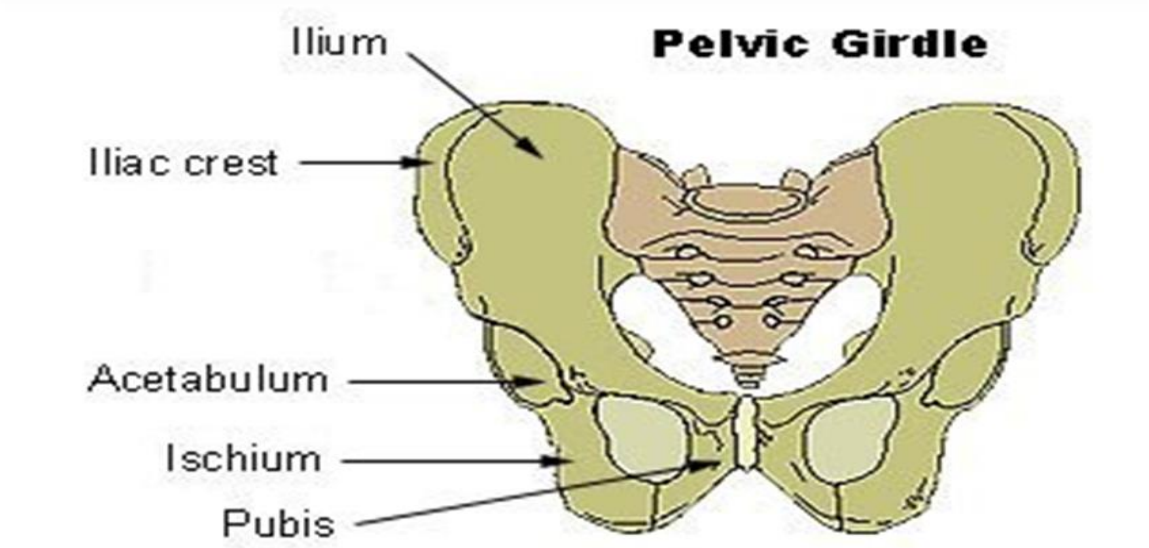
1-Ilium.

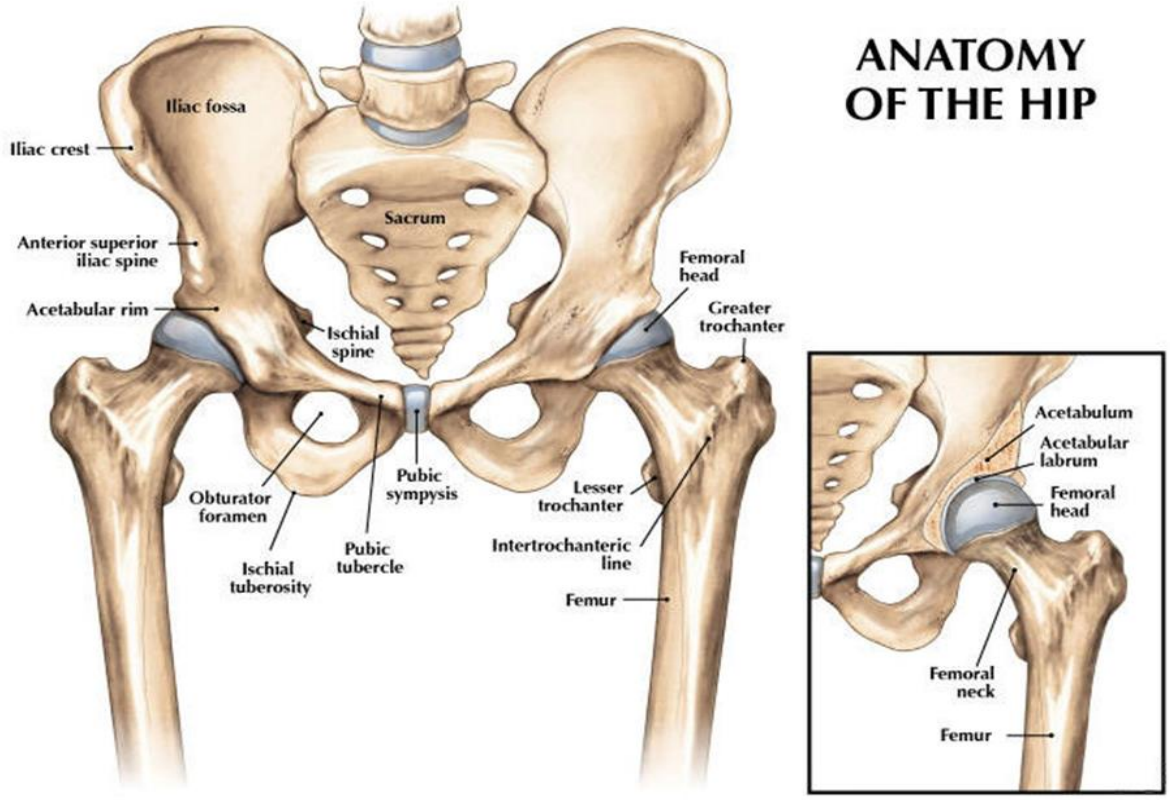
2-Pubic.

3-Ischium.

Acetabulum: It is a cavity in the middle of external surface of hip bones which is articulate with the head of femur and form the hip joint.

Obturator foramen: Large foramen found in the lower part of hip bone surrounded by the pubic and ischium bones. Differ in shape, in male has oval shape while in female has triangular shape**.**





2. Skeleton of thigh: contain one bone called femur.

Femur: It is the longest and strongest bone in the body. It consists of body and two ends. The upper end articulates with hip bone in hip joint and the lower end articulate with tibia in knee joint.

Patella: It is a sesamoid bone has triangular shape bone lies in front of the lower end of femur; the base of it above and the apex is below.

3. Skeleton of the leg: have two bones:

1-Tibia: it is larger bone extends on the medial side of the leg.

2-Fibula: it is long bone thinner than tibia bone extends on the lateral side of the leg.

4. Skeleton of foot: -

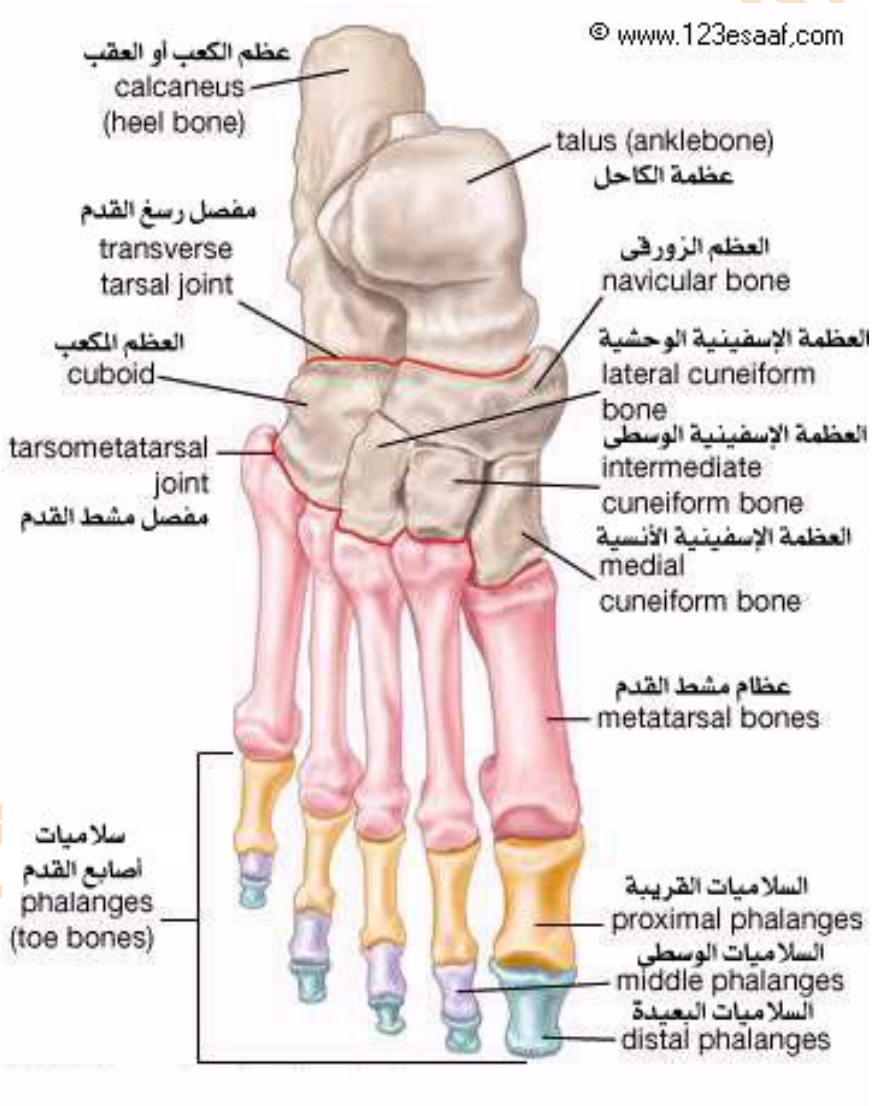
A-Skeleton of ankle: it consists of (7 tarsal) bones arranged into 2 rows:
1. Posterior row: it has two bones:
a- Talas.
b- Calcaneus.

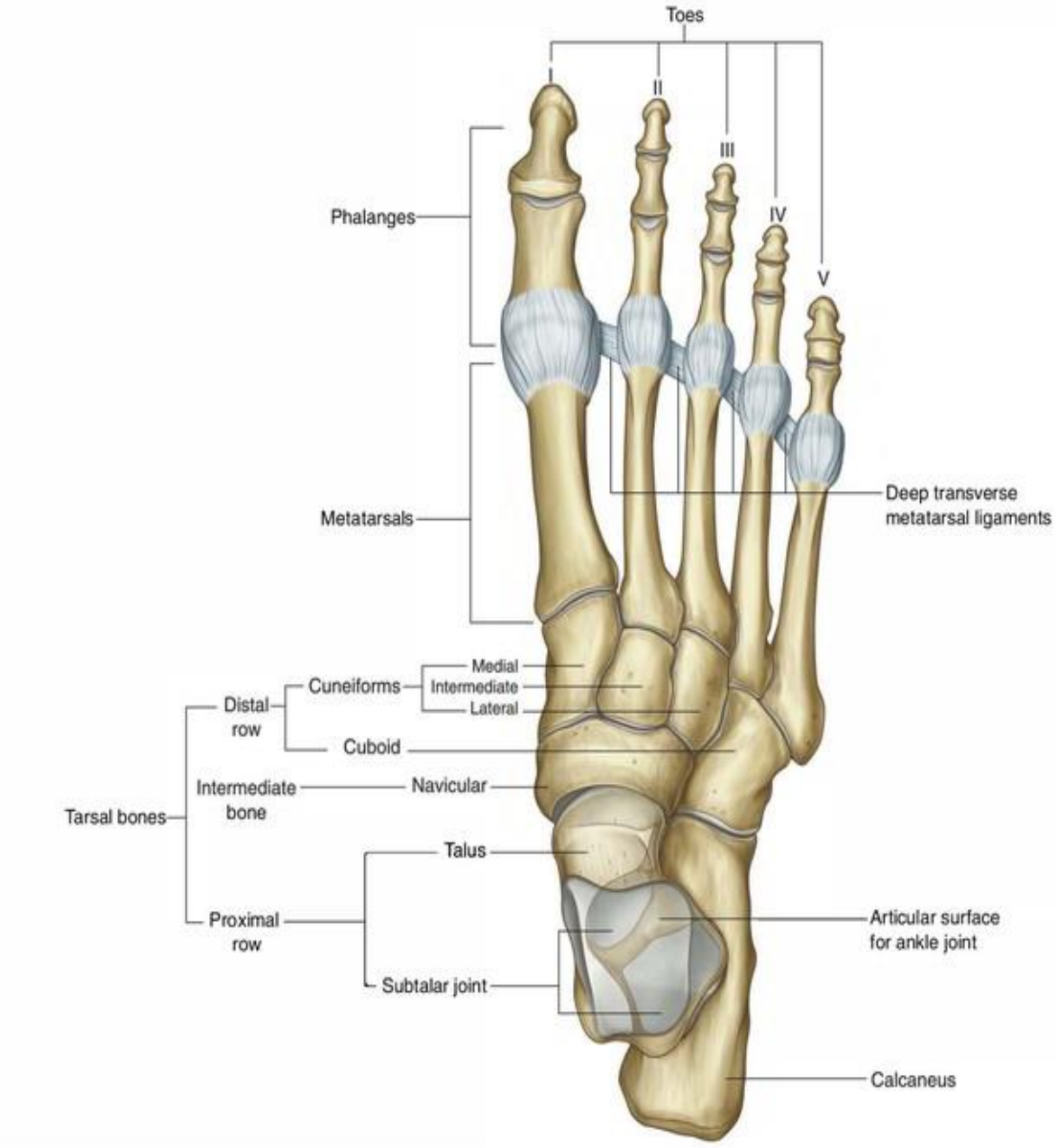
2. Anterior row: have (4) bones:
a. Medial cuneiform bone. b. Intermediate cuneiform bone.
c. Lateral cuneiform bone. d. Cuboid bone.

The 7th bone called navicular bone lies between two rows in the medial side.

B. Skeleton of sole:
It has (5) metatarsal bones. They are long bone have body and two ends. Proximal end articulates with anterior row of tarsal bone and distal end articulates with phalanges.

C. Skeleton of toes:
They have (3) phalanges except the great toe has two.





Quiz / 7 Define: -

1- Obturator foramen. 2- Pubic arch.

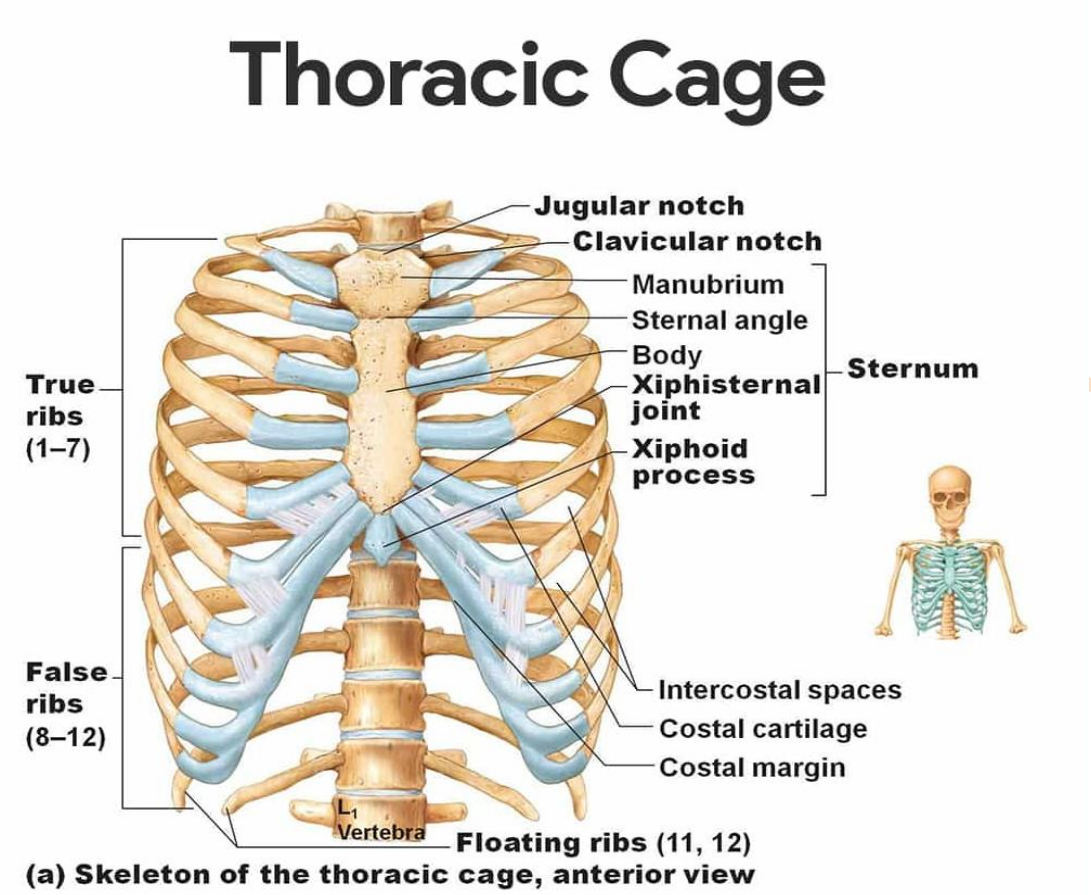
Quiz / 8

Explain hip bone.

Note: -

-Check your answers in key answer page at the ending of this modular unit.

Skeleton of thorax



The skeleton of thorax forms the thoracic cage that consists of: -

1. **The sternum:** form the anterior wall of the thoracic cage.
2. **The thoracic vertebrae:**(12) vertebras form the posterior wall of the thoracic cage.
3. **Ribs:** (12) pairs form the sides of the thoracic cage.

Sternum: -

It is a flat bone that forming the anterior wall of thoracic cage. The first seventh ribs attached to it. The sternum consists of three parts: -

a. **Manubrium:** it forms the upper part of sternum. In the upper border of manubrium there is concave called **(supra – sternal notch).** On both sides of the notch there are articulator surface with right and left clavicles through the sterno -clavicular joint and below it there is articular surface for attachment of the first rib.

b. **Body of sternum:** It is flat rectangular part that has four borders: upper border articulated with manubrium , right and left borders articulated

with cartilage of (2nd to 7th) ribs , the lower border articulate with xiphoid process .

c. **Xiphoid process:** it is the lower part of sternum which is cartilaginous piece.

The diaphragm attached to xiphoid process posteriorly.

Ribs: -

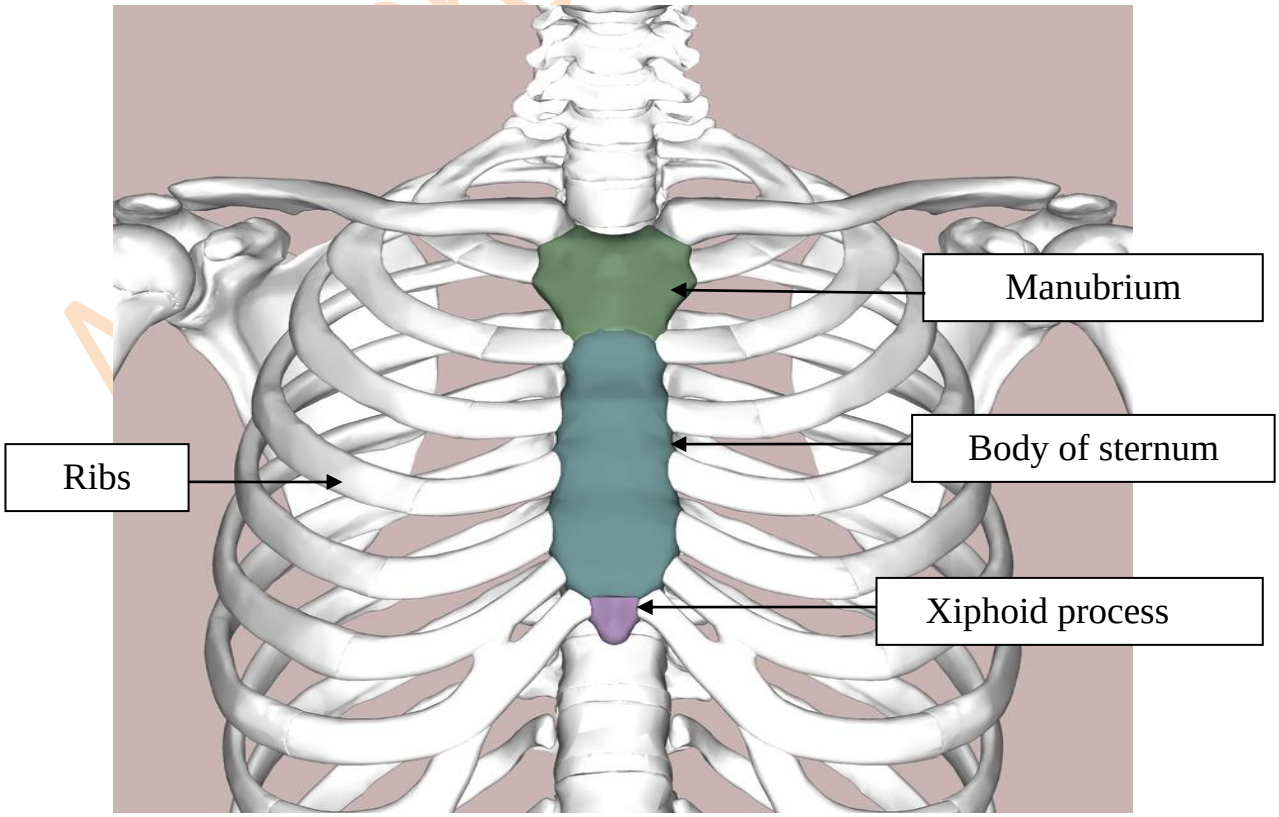
It is (12) pairs that attached to vertebral column posteriorly, and extend down wards and interiorly to attach the sternum (some of them attached to sternum directly, and the other attached with each other, while other not attached to anything). So they are divided in to two general types: -

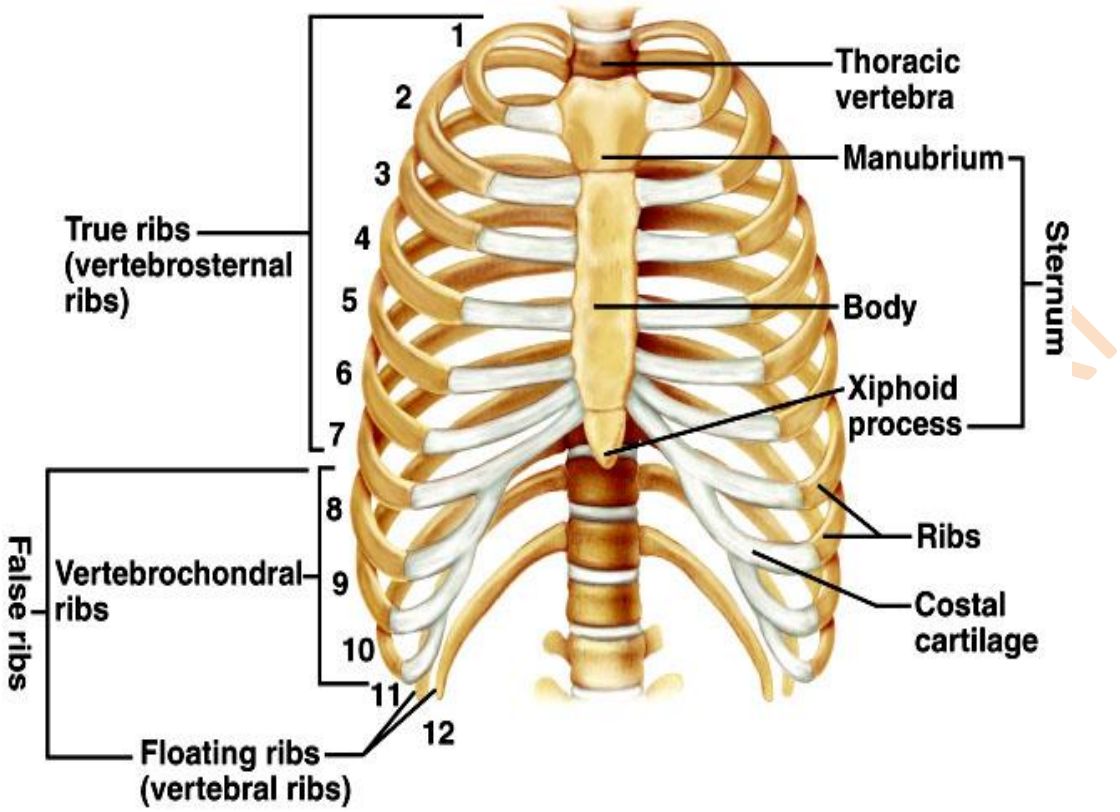
1. True ribs: it is the first seven ribs attached to sternum directly by costal cartilages.

2. False ribs: the lower fifth ribs, (and they are two types): -

A-False non floating ribs: they are (8th, 9th, 10th) ribs which attached to sternum indirectly by cartilage.

B-False floating ribs: they are (11th, 12th) ribs which not attached to anything so it floating.





Quiz / 9
Mention parts of sternum.

Quiz / 10
Enumerate and mention types of ribs.

Quiz / 11 Compare between: -

- True ribs and False ribs.

Note: -
-Check your answers in key answer page at the ending of this modular unit.

Skeleton of head

The skeleton of the head consists of the skull that consist of number of bones that attached to each other without movement except the lower jaw. The area of the articulation called sutures .it consists of:

1. **Cranium:** that consist of:
   a. Calvaria.
   b. The skeleton of face.
2. **Lower jaw** (Mandible).

Cranium: -

a. Calvaria: It forms the upper part of the Cranium it composed of (8**)** sutured bones (cranial bones).

b. The skeleton of face: It consist of (13) sutured bones and (1) mandible

1. Two Maxillary bones (maxilla).
2. Two zygomatic bones.
3. Two nasal bones.
4. Two Lacrimal bones.
5. Two palatine bones (palate).
6. Two inferior nasal conchae.
7. One vomer bone.

Upper part of face (fixed)

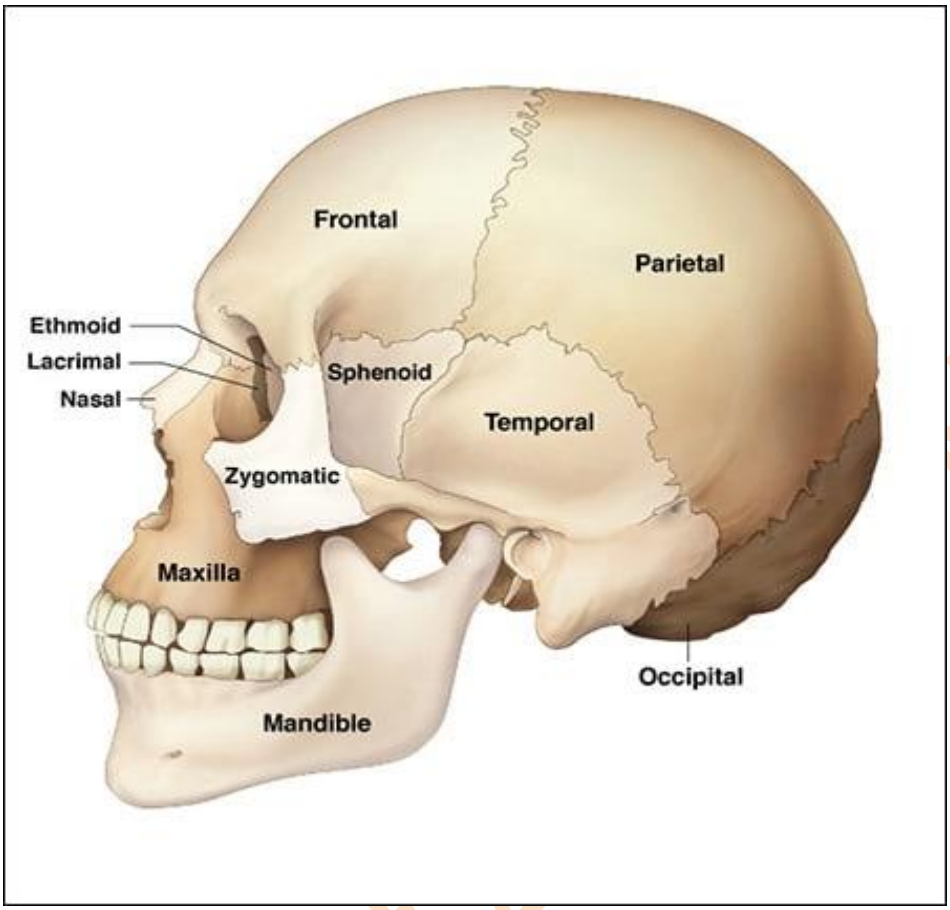
1. One mandibular bone (mandible).

Lower part of the face (movable)

1. Superior view of the skull:

If we see the skull from the above, it has ellipsoid shape that is wider posteriorly than anteriorly. The bones from the anterior to the posterior:

1. Frontal bones.
2. Two parietal bones (right and left).
3. Occipital bone.



These bones articulated by sutures are: -

1. Frontal suture: This suture situated between two frontal bone.

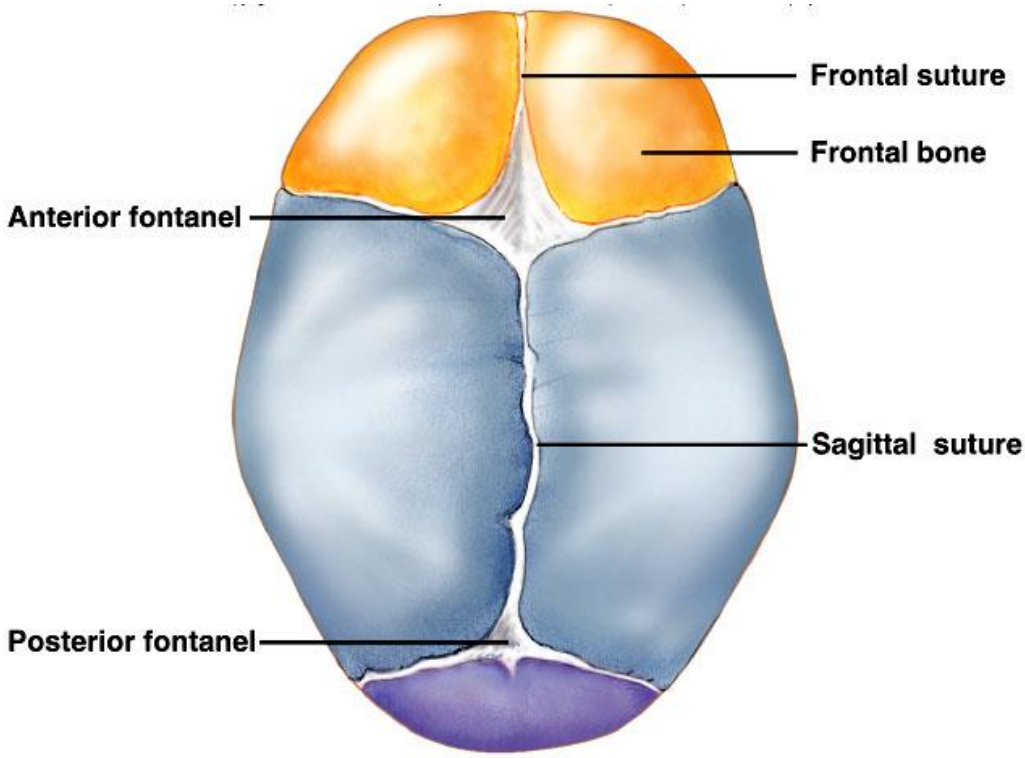
2. Coronal suture: This suture situated between the parietal bones and frontal bone.

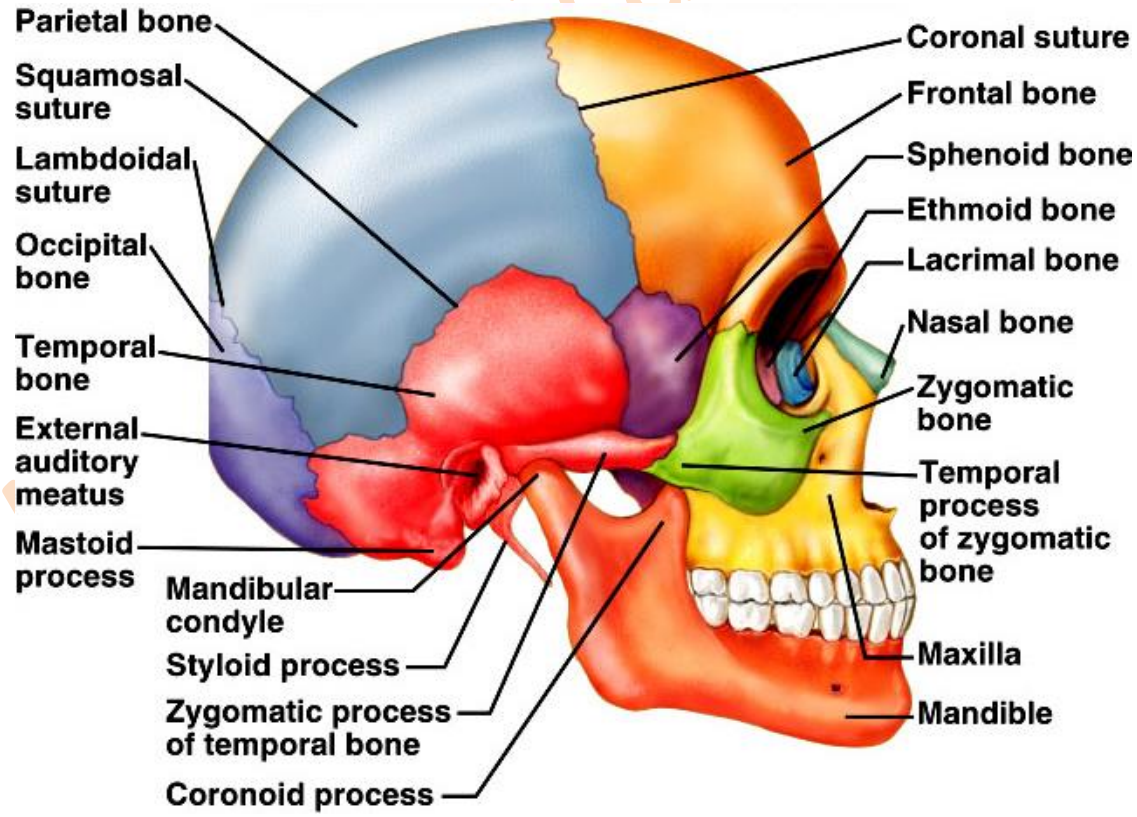
3. Sagittal suture: This suture situated between the parietal bones.

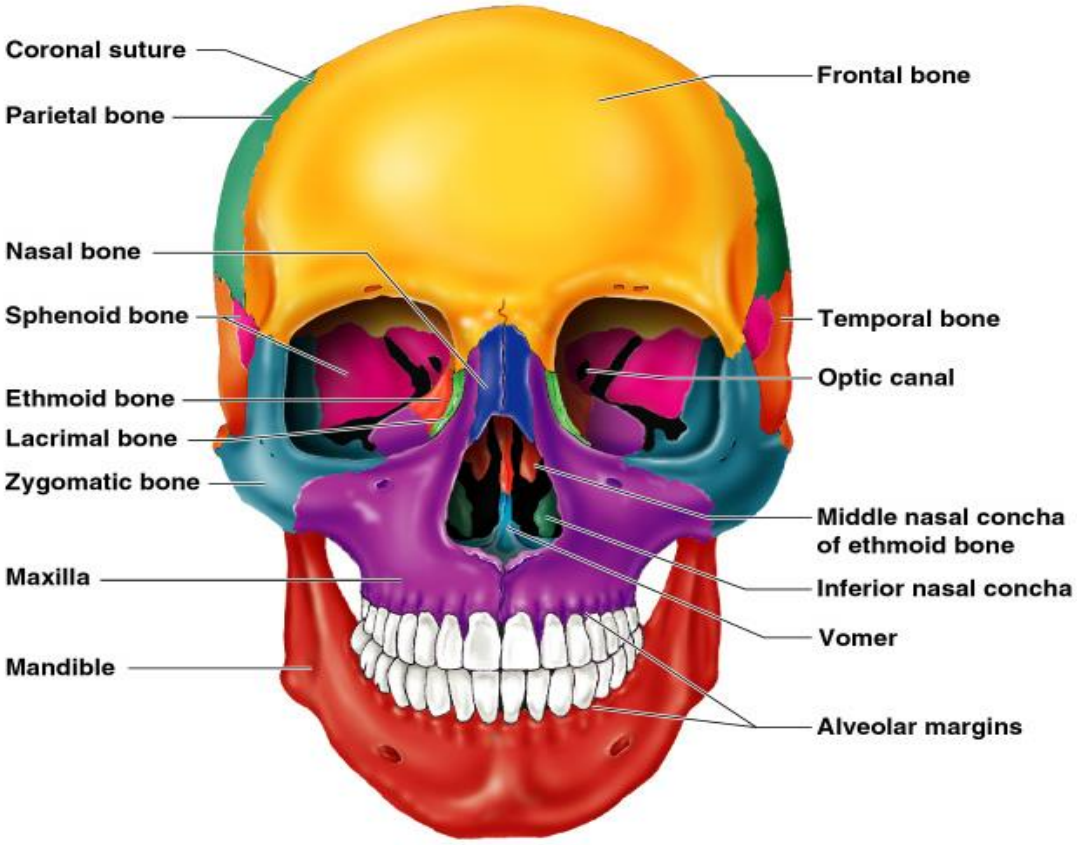
4. Pariato – occipital suture (lambdoid suture): this suture situated between the parietal bones and occipital bone.

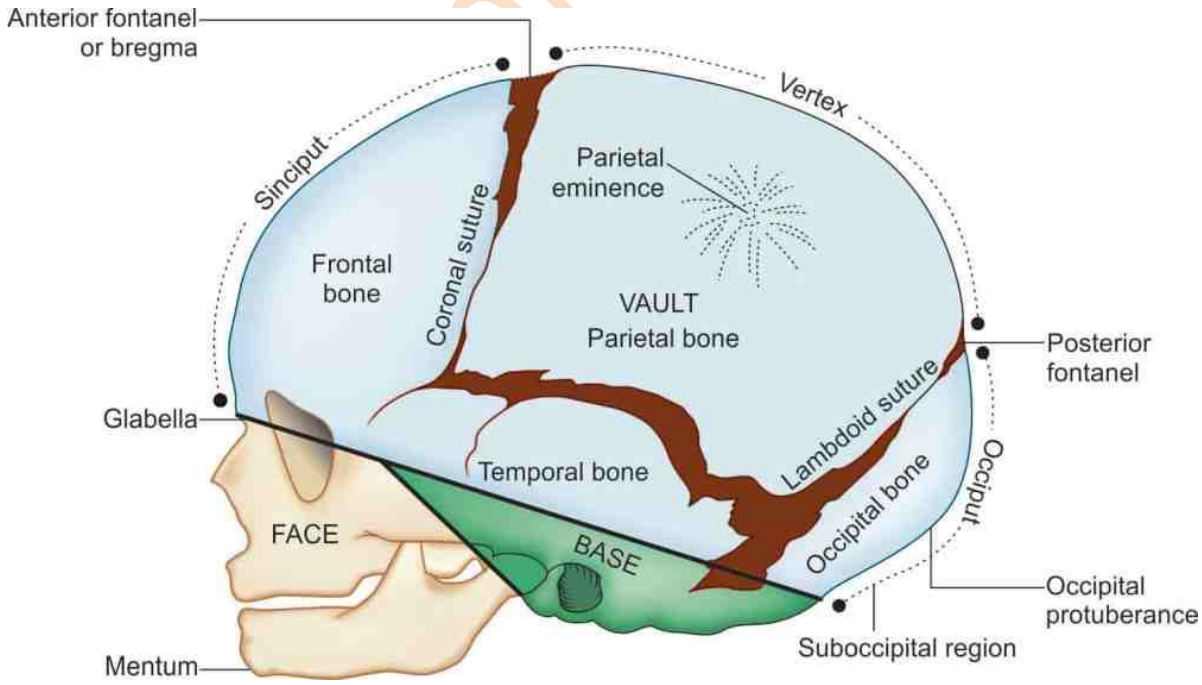
- **Anterior fontanelle (Bregma):** it represents the area of the connection of the sagittal suture and the coronal suture.

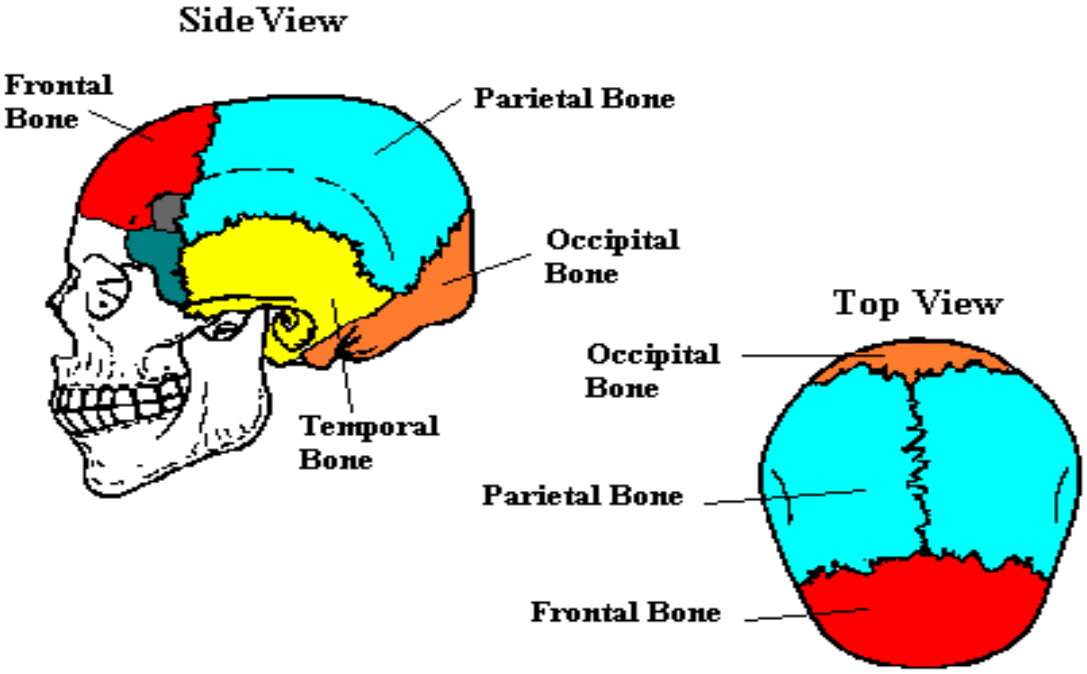
- **Posterior fontanelle (lambda):** it represents the area of the connection of the sagittal suture and the pariato –occipital suture.


Frontal suture
Frontal bone
Anterior fontanel
Sagittal suture
Posterior fontanel


Parietal bone
Squamosal suture
Lambdoidal suture
Occipital bone
Temporal bone
External auditory meatus
Mastoid process
Mandibular condyle
Styloid process
Zygomatic process of temporal bone
Coronoid process
Coronal suture
Frontal bone
Sphenoid bone
Ethmoid bone
Lacrimal bone
Nasal bone
Zygomatic bone
Temporal process of zygomatic bone
Maxilla
Mandible


Coronal suture
Parietal bone
Nasal bone
Sphenoid bone
Ethmoid bone
Lacrimal bone
Zygomatic bone
Maxilla
Mandible
Frontal bone
Temporal bone
Optic canal
Middle nasal concha of ethmoid bone
Inferior nasal concha
Vomer
Alveolar margins

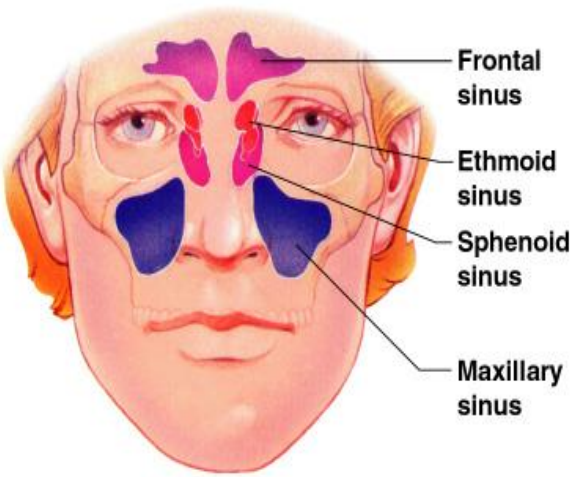

Anterior fontanel or bregma
Vertex
Sinciput
Parietal eminence
Frontal bone
Coronal suture
VAULT
Parietal bone
Posterior fontanel
Glabella
Lambdoid suture
Occiput
Temporal bone
Occipital bone
FACE
BASE
Occipital protuberance
Suboccipital region
Mentum

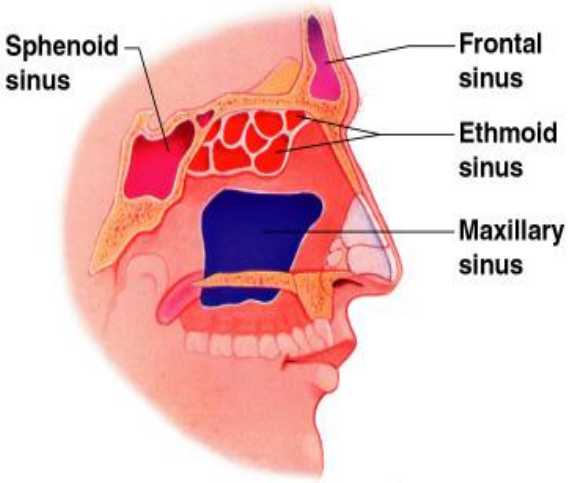


Hollow portions of bones surrounding the nasal cavity

The paranasal sinuses: -

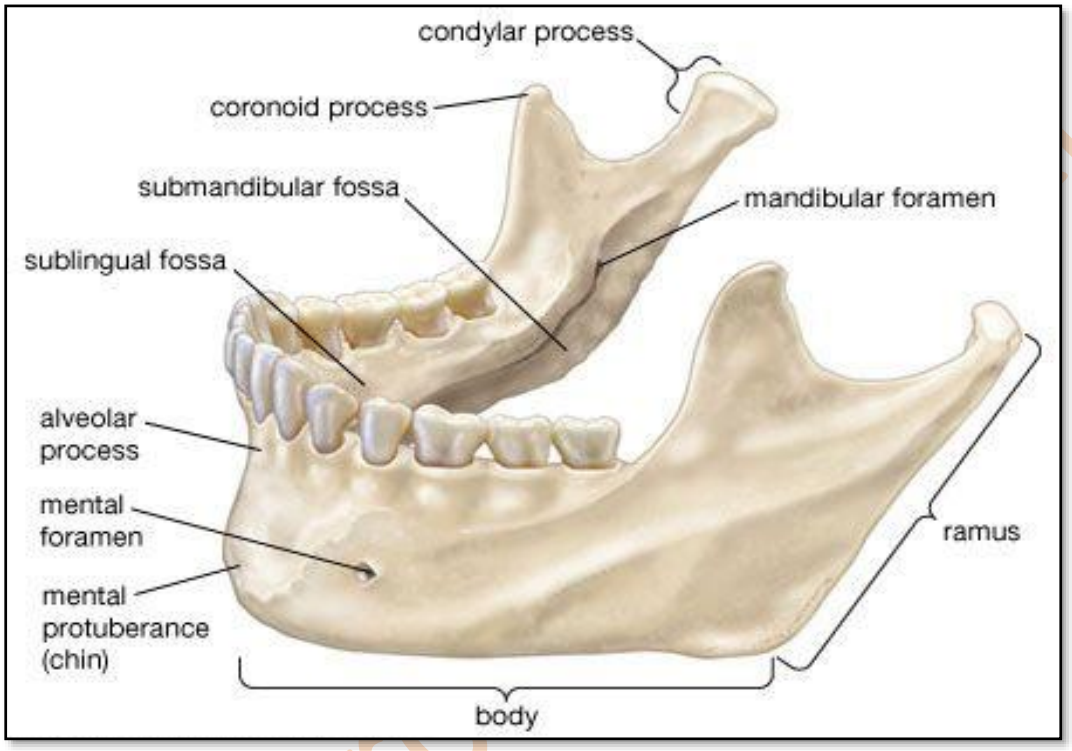
1- Frontal sinus.
2- Ethmoid sinus.
3- Sphenoid sinus.
4- Maxillary sinus.

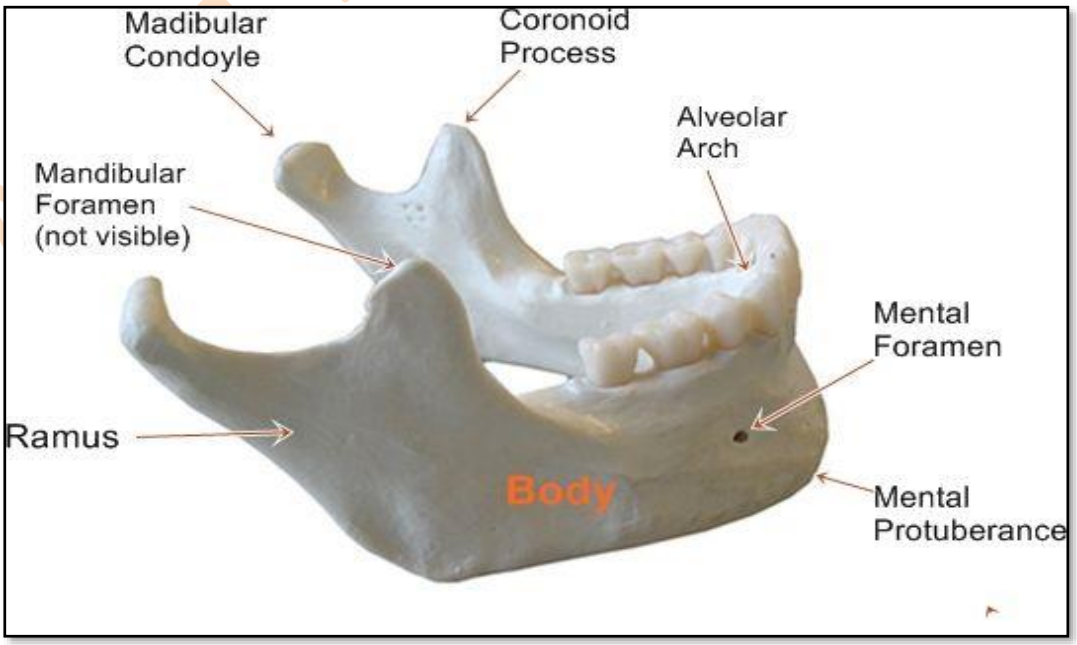


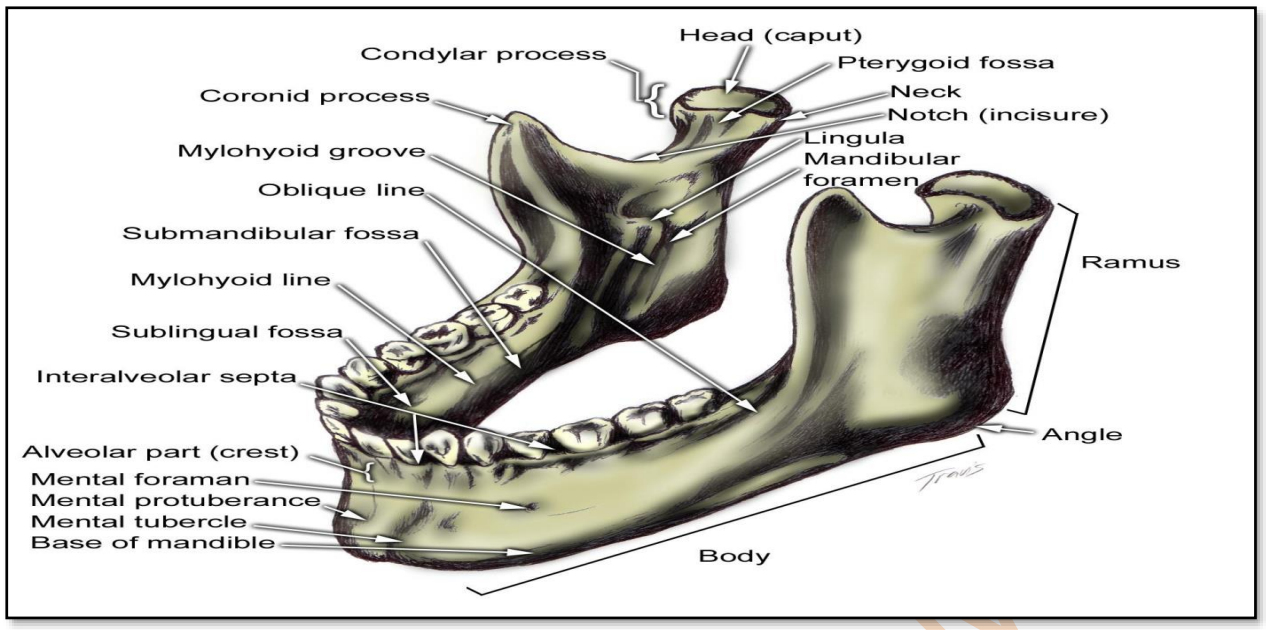


Mandible (lower jaw articulated with temporal bone in the temporomandibular joint (T.M.J.) it has the following:

1. **Body:** it is strongest part of the bone and has two borders: lower border and upper border that carry the lower teeth.
2. **Ramus:** two flat parts right and left, each one has two prominences: - A. Condylar process: posteriorly. B. Coronoid process: anteriorly.







Quiz / 12

Enumerate sutures of the skull and mention the bones of each suture.

Quiz / 13
Enumerate the foramina lie in middle cranial fossa.

Quiz / 14
Explain the Mandible.

Note: -
-Check your answers in key answer page at the ending of this modular unit.

Vertebral column

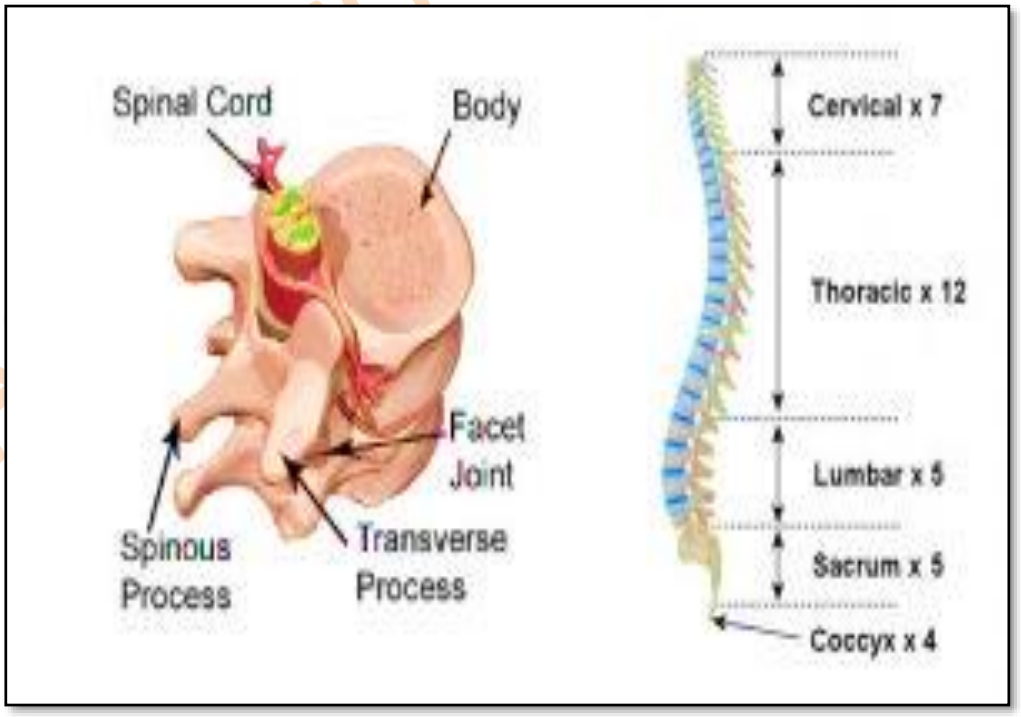
It represents the central of the bony skeleton of the body. It consists of number of irregular bone called **(vertebrae)** arranged one over each other ; between them fibrous discs called**(inter –vertebral discs)** which act as shock absorber. The vertebrae contain canal called **(inter –vertebral canal) which contain the spinal cord.**

-The regions (parts) of vertebral column:

The vertebral column consists of (33) vertebrae arranged in 5 regions are:

1. **Cervical region:** consists of (7) vertebrae called cervical vertebra.
2. **Thoracic region:** consists of (12) vertebrae called thoracic vertebra.
3. **Lumbar region:** consists of (5) vertebrae called lumbar vertebrae.
4. **Sacral region:** consists of (5) vertebrae called sacral vertebrae.
5. **Coccyx region:** consists of (4) vertebrae called coccyx vertebrae.

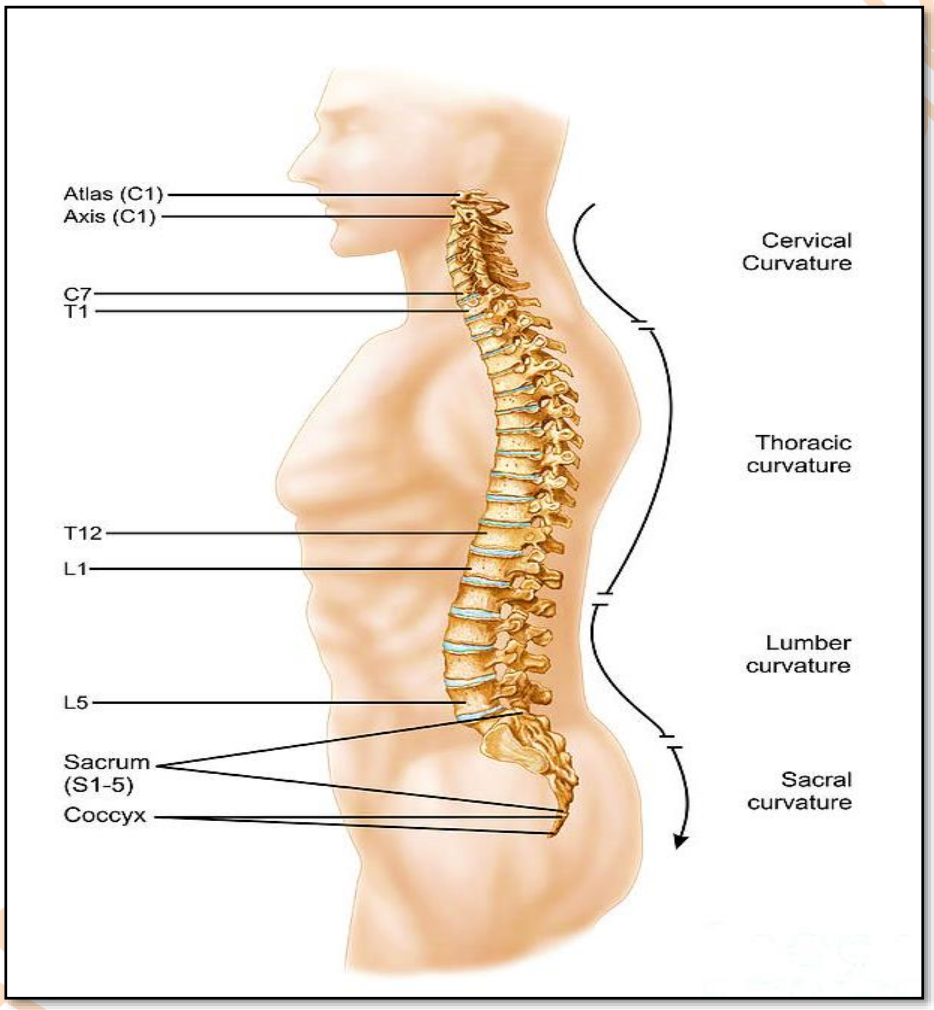
The vertebrae of the first three regions characterized by its mobility so it's called movable vertebrae while the vertebrae of the fourth and fifth region fused to each other to form one bone.



-The lateral view of Vertebral column: -

If we look to the vertebral column from the lateral side, there are curvatures:

1. The cervical curvature convex anteriorly.
2. The thoracic curvature convex posteriorly.
3. The lumbar curvature convex anteriorly.
4. The sacro- coccyx curvature convex posteriorly.



Vertebrae: irregular bones, (33) in number differ according to the position but have the same general parts.

Typical Vertebrae consist of: -

1. **Body of vertebra**: It form the anterior part of the vertebrae that has 2 surfaces (superior and inferior surface).

2. **Vertebral arch:** It consists of: -

a. Pedicles: it is pair of bony prominence that attached to the posterior part of the vertebral body.

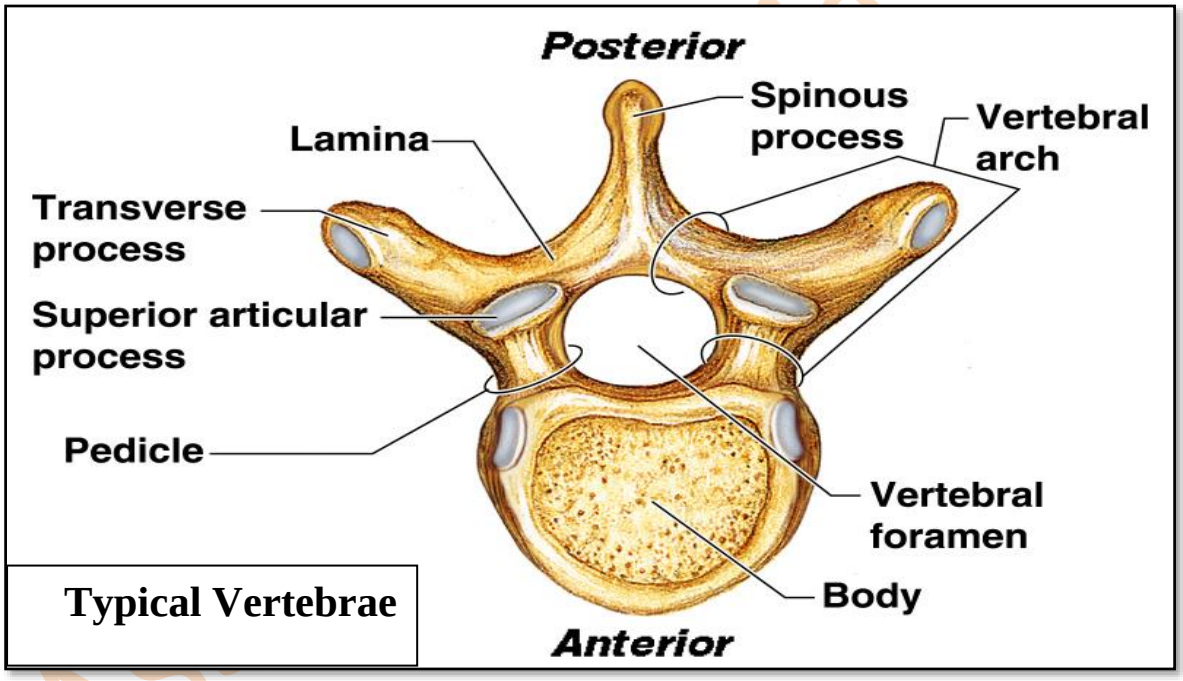
b. Lamina: it is bony plate attached to posterior end of pedicles and there are two, one for each pedicle, extends to the medial to fuse to each other posteriorly to form the vertebral arch.

3. **Vertebral process:** They are (7) processes:

a. **Spine:** It is one bony prominence at area of fusion of the two lamina differs in length according to the type and position of the vertebrae.

b. Transverse process: there are two one in each side at site of attachment lamina with pedicles.

c. Articular process: there are (4) bony prominences two of them in the upper and other two in the lower.



Typical Vertebrae

1. Cervical vertebrae: There are (7) vertebrae lie in neck area.

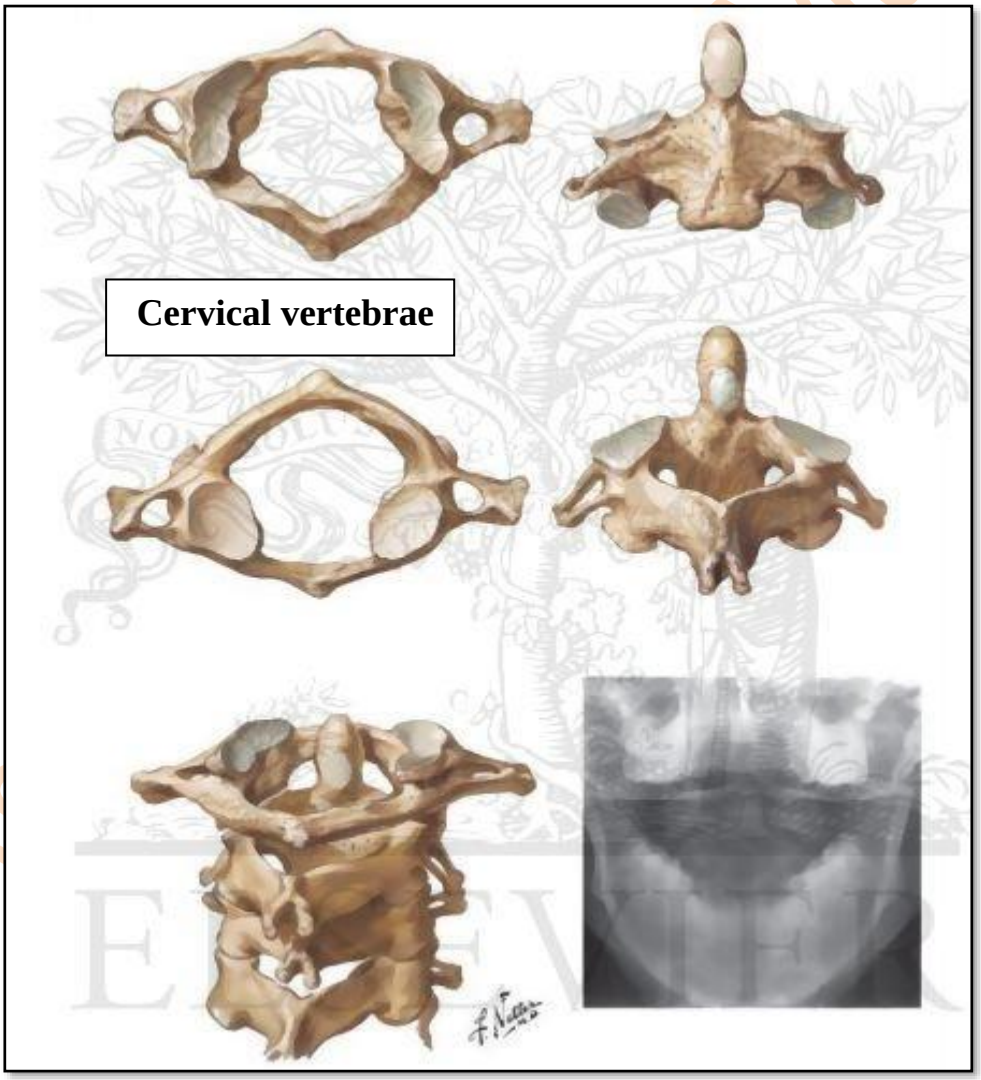
General characteristic (3rd, 4th, 5th, 6th vertebrae):

1. Small body.
2. Wide triangular vertebral foramen.
3. Small divided spine.
4. Presence of transversalic foramen in the transverse process.

Atlas: It is the first cervical vertebrae lies below the skull that articulate with it. It characterized by ring –like form with no body and no spine but there is transverse process and with anterior and posterior arches.

Axis: It is the second cervical vertebrae it characterized by presence of odontoid process wide vertebrae foramen and short transverse process.

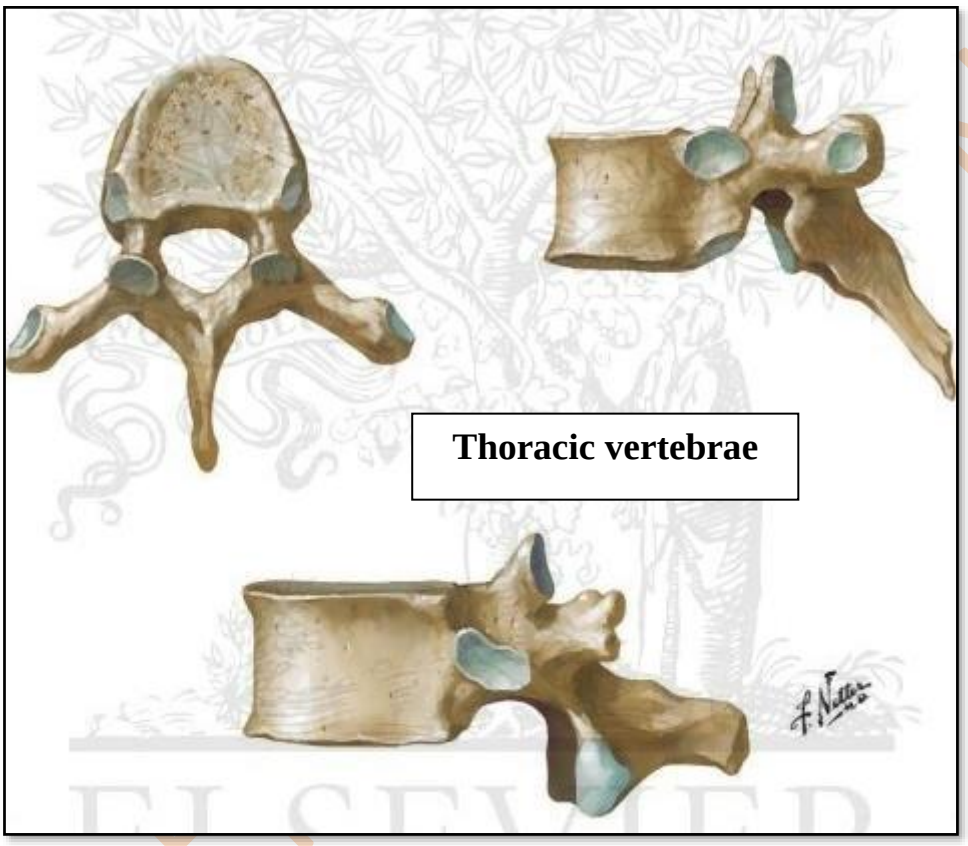
Vertebra prominence: It is the (7^{th}) cervical vertebrae it is called so **because it has long spine and big transverse process.**



2. Thoracic vertebrae: There are (12) vertebrae lie in thoracic region.

General characteristic:

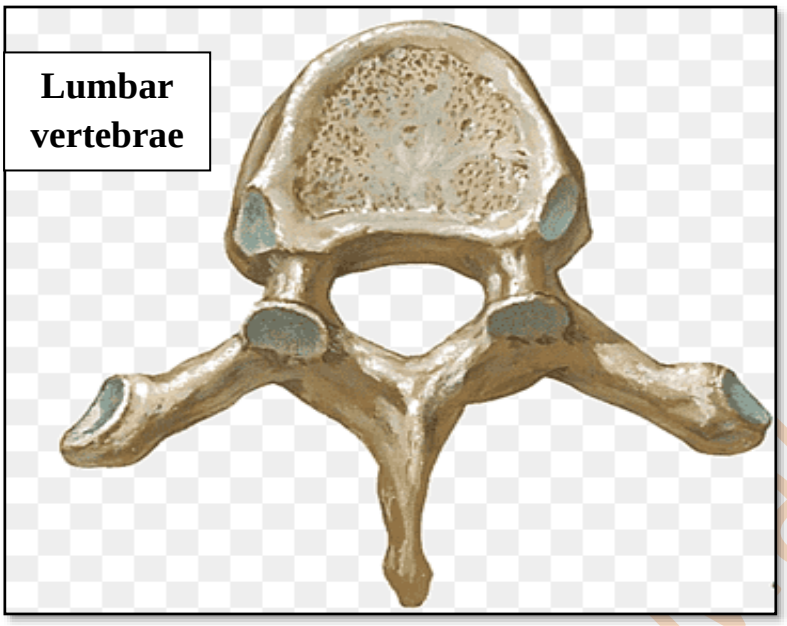
1. It has body larger than cervical vertebrae and smaller than the lumbar vertebrae.
2. Its body has heart shape.
3. The spine is long and tapered.
4. It has six articular facets.



3. Lumbar vertebrae: There are (5) vertebrae.

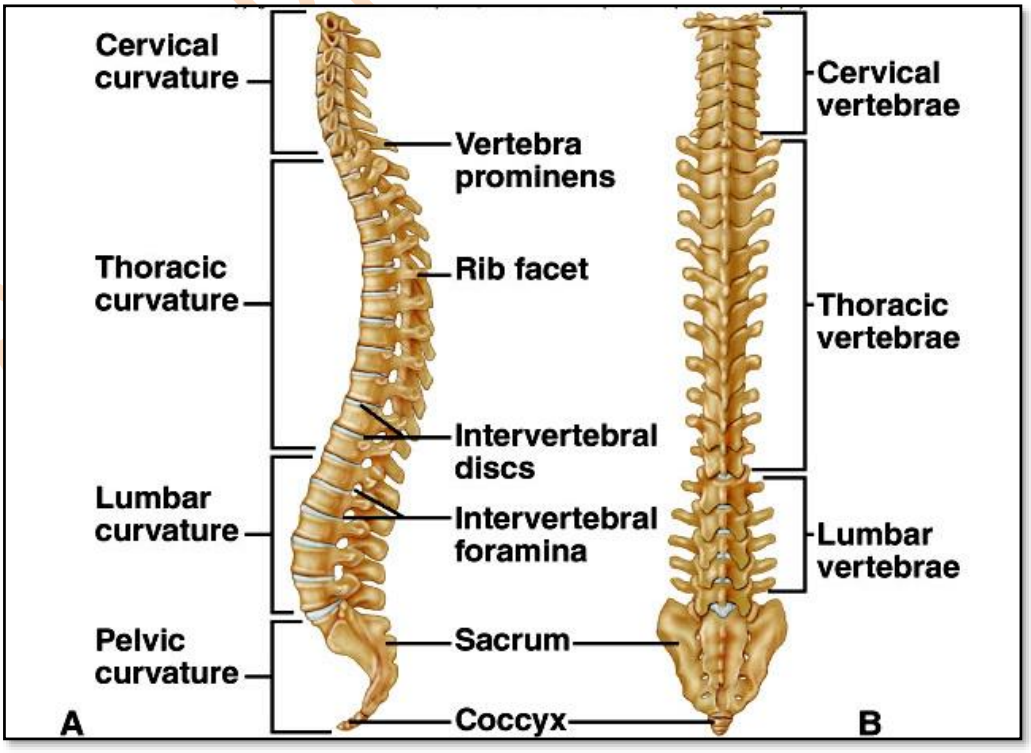
General characteristic:

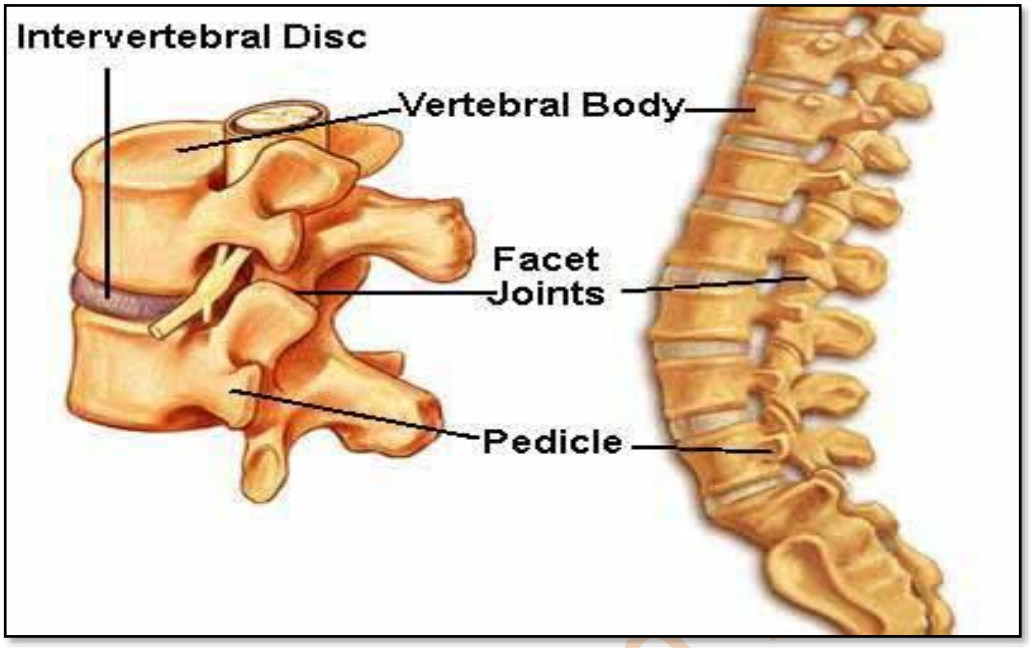
1. It is largest vertebrae.
2. Its body has kidney shape.
3. No articular facets.
4. Triangular vertebral foramen.
5. Short wide spine.

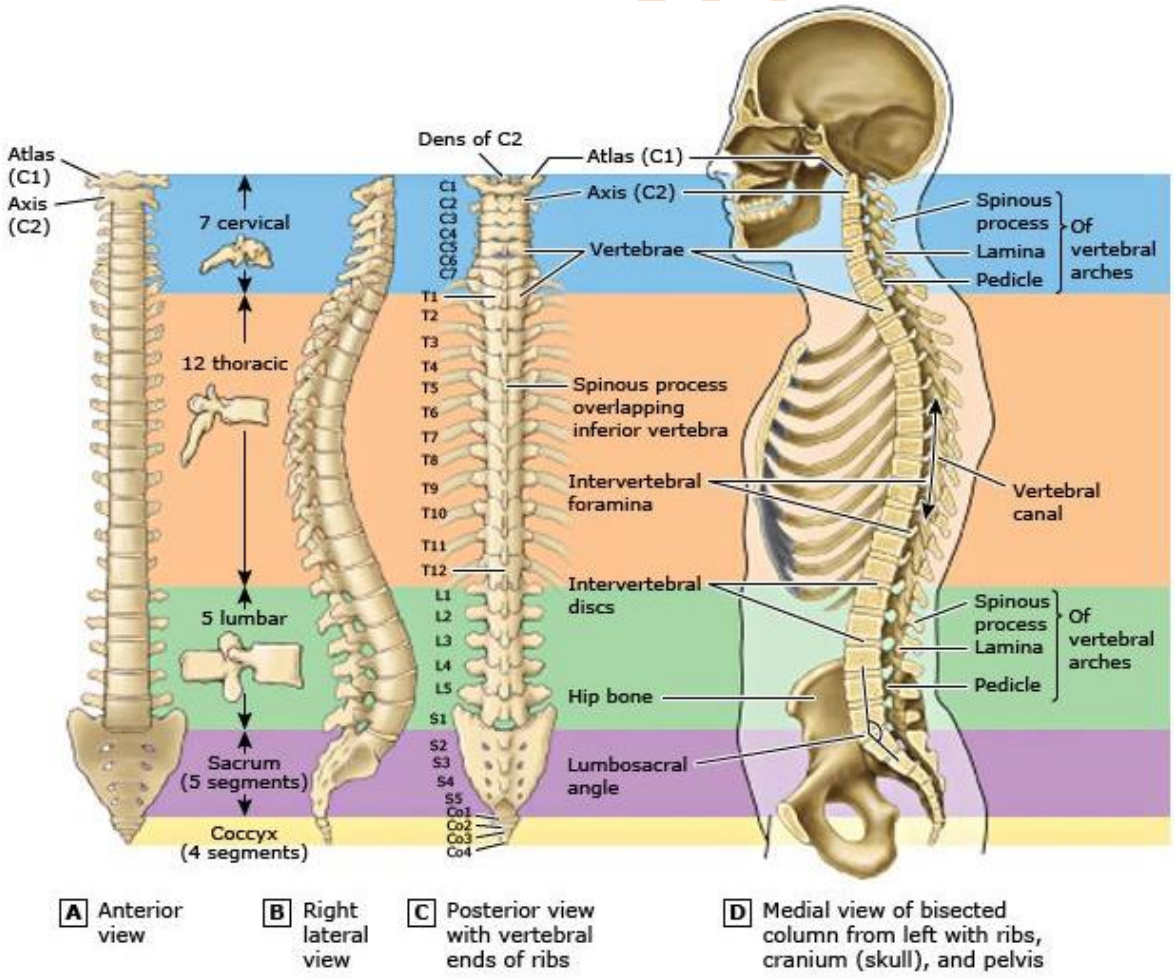


4. Sacral vertebrae: They are (5) vertebrae fused to each other to appear as one bone called sacrum which is triangular bone; its base upwards and articulated with fifth lumber vertebra while the apex downwards and articulated with coccyx vertebrae. It has two surfaces anterior surface and posterior surface and have two borders.

5. Coccyx vertebrae: is small triangular bone consisting of (4) vertebrae that fused and may increase or decrease one in number (3or 5).




Intervertebral Disc
Vertebral Body
Facet Joints
Pedicle


Atlas (C1)
Axis (C2)
7 cervical
12 thoracic
5 lumbar
Sacrum (5 segments)
Coccyx (4 segments)
Dens of C2
Atlas (C1)
Axis (C2)
Vertebrae
Spinous process overlapping inferior vertebra
Intervertebral foramina
Intervertebral discs
Hip bone
Lumbosacral angle
Spinous process
Lamina
Pedicle
Of vertebral arches
Vertebral canal
A Anterior view
B Right lateral view
C Posterior view with vertebral ends of ribs
D Medial view of bisected column from left with ribs, cranium (skull), and pelvis

Quiz / 15
Mention the regions of vertebral column.

Quiz / 16
Enumerate vertebral process.

Quiz / 17
Define the vertebra prominence.

Note: -
-Check your answers in key answer page at the ending of this modular unit.

5/post test

Answer with true (T) or false (f) for each of the following statements: -

1- Sesamoid bones contain sinus filled with air like.
2- Spine of scapula: long bony prominence that extends from lateral border to the lateral angle of scapula.
3- Patella: is a sesamoid bone has triangular shape bone lies in front of the lower end of femur.
4- Pair of bony prominence attached to the posterior part of the vertebral body called pedicles.
5- In the upper border of manubrium there is concave called (supra – sternal notch).
6- The sternum: form the posterior wall of the thoracic cage.
7- The lumbar curvature concave anteriorly.
8- Calvaria: It forms the upper part of the Cranium, composed of (8) cranial bones.
9- Posterior fontanelle represents the area of the connection of the sagittal suture and the parieto –occipital suture.
10-Body of mandible: it is strongest part of the mandible bone has two borders.

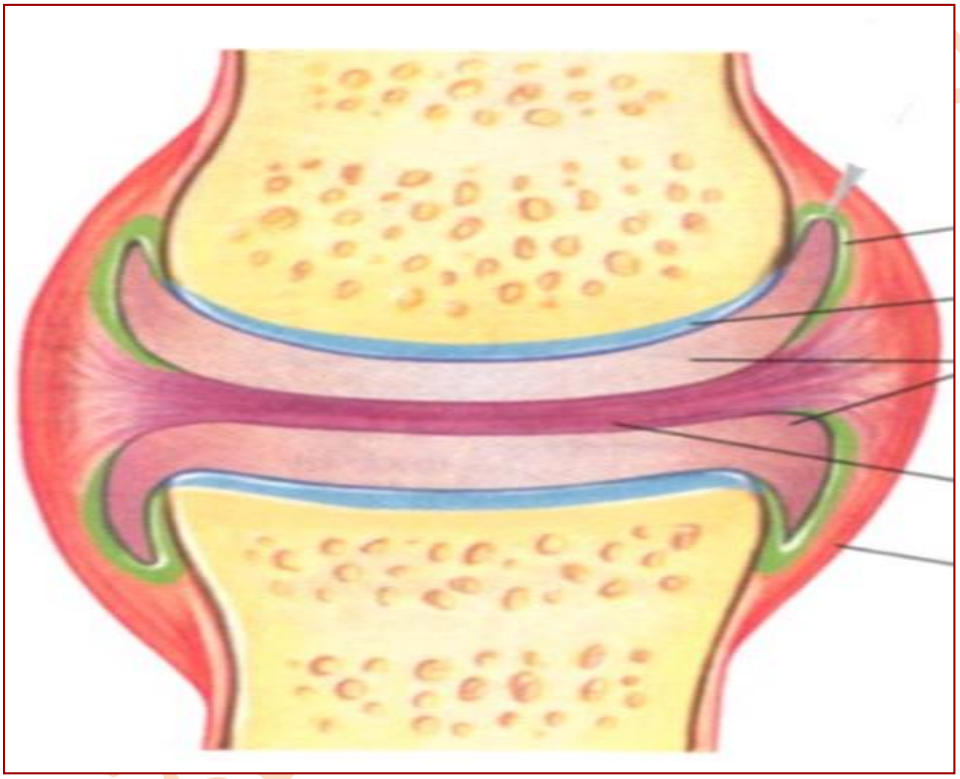
Note: -
-Check your answers in key answer page at the ending of this modular unit.
- (1) degree for each.

6/ Key answer

Pre test		Post test
1. T.	Quiz / 1 see page no. 29.	1. F.
2.T.	Quiz / 2 see page no. 29.	2.F.
3. T.	Quiz / 3 see page no. 30.	3. T.
4. F.	Quiz / 4 see page no. 31.	4. T.
5.F.	Quiz / 5see page no. 32.	5.T.
6.F.	Quiz / 6see page no. 32.	6.F
7.T.	Quiz / 7 see page no. 35.	7.F
8. T.	Quiz / 8 see page no. 34.	8.T
9. T.	Quiz / 9 see page no. 37.	9.T
10.T.	Quiz / 10 see page no. 38.	10.T
	Quiz / 11see page no. 39.	
	Quiz / 12 see page no. 40.	
	Quiz / 13 see page no. 41.	
	Quiz / 14 see page no. 43.	
	Quiz / 15 see page no. 45.	
	Quiz / 16 see page no. 46.	

If you: -
***Got 9 or more you do not need to proceed.**
***Got less than 9you have to study this modular unit very well.**

The fourth modular unit



The joints

1 / over view

1/A-Target population: -

This unit Learning package had been designed to the first class students in the community health Dept. KARBALA institute Technology.

1/B-Rationale: -

A joint (or articular surface) is the connection made between bones in the body which link the skeletal system into a functional whole. They are constructed to allow for different degrees and types of movement. Some joints, such as the knee, elbow, and shoulder, are self-lubricating, almost frictionless, and are able to with stand compression and maintain heavy loads while still executing smooth and precise movements. Other joints such as sutures between the bones of the skull permit very little movement (only during birth) in order to protect the brain and the sense organs. The connection between a tooth and the jawbone is also called a joint, and is described as a fibrous joint known as a gomphosis. Joints are classified both structurally and functionally.

1/C-Central Idea: -

1- Joint definition.
2- Types of joints.
3- Types of synovial joints.
4- Joints of upper limb.
5- Joints of lower limb.
6- Joints of the trunk.
7- Joints of the skull.

1/D-Instructions: -

1- Study over view thoroughly.
2-Determine the performance objectives.
3-Do the pretest and if you have: -
A-Got 9 or more you do not need to proceed.
B-Got less than 9you have to study this modular unit very well.
4-After studying the text of this modular unit, do the post test, and if you have: -
A-Got 9 or more, go to the second modular unit.
B-Got less than 9, go back and return to study this modular unit; or any part of it; and then return to perform the posttest again.

2/performance objectives :-

After studying this modular unit, the student will be capable to:
1-Define the joints.
2-Know types of joints.
3-Mention types of synovial joints.
4-Determine the joints of the upper limb.
5- Named the joints of the lower limb.
6- Divided the joints of the trunk.
7- Divided the joints of the skull.

3/pre test :-

Answer with true (T) or false (f) for each of the following statements: -

1- Fibrous joint are immovable joints; their articular surfaces are attached with each other by strong fibrous tissues.
2- Fibrous joint surrounded by fibrous capsule.
3-One example of hinge joints is inter –phalangeal joints.
4- Shoulder joints represent area of the articulation between the head of humerus with glenoid cavity of the scapula.
5-The joint between the carpal bones called Inter –carpal joint.
6- Knee joint: between the lower end of femur with upper end of tibia.
7- Ankle joint: this joint between the both tibia and fibula with talus bone.
8- Pubic symphysis represents the articulation between the right and left sacral bone.
9- Inter –vertebral joints: between the vertebrae and ribs.
10-Joints of the skull called bregma.

Note: -
-Check your answers in key answer page at the ending of this modular unit.
- (1) degree for each.

4/ the text:-

The joints

The joint is the area of articulation between the two bones or more or between the bone and cartilage where the movement can occur. The joints are classified according to the degree of movement into three types:

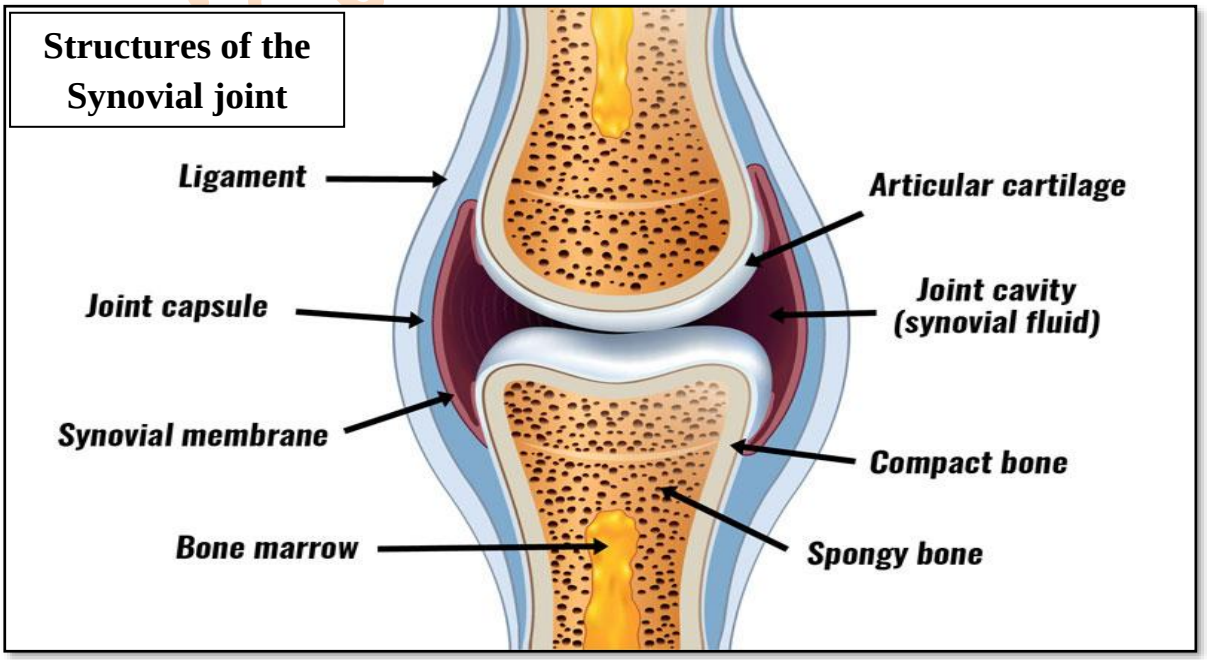
1- Fibrous joint.
2- Fibro- cartilaginous joint.
3- Synovial joint.

1-Fibrous joint: They are immovable joints; their articular surfaces are attached with each other by strong fibrous tissues, so the movement is absent and called fixed joints. Example: Sutures of the skull.

2-Fibro- cartilaginous joint: They are permitting simple or limited movement; their articular surfaces are attached with other by fibro- cartilaginous tissue. Example: pubic symphysis, Inter vertebral dices.

3-Synovial joint: They are with free degree of movement than other type and characterized by the following: -

a. Articular surfaces are cover by the hyaline cartilage.
b. The joint surrounded by fibrous capsule.
c. The surfaces of bone are covered by the synovial membrane.
d. The joint contain synovial fluid.



Synovial joints are classifieds according to the shape of articular surfaces into different types:

1-Ball and socket joints: the movement of this joint is free and in all direction. Flexion and extension b. abduction and adduction c. rotation .one of articular surface is ball shape and other socket shape.
Example: shoulder joint, hip joint.

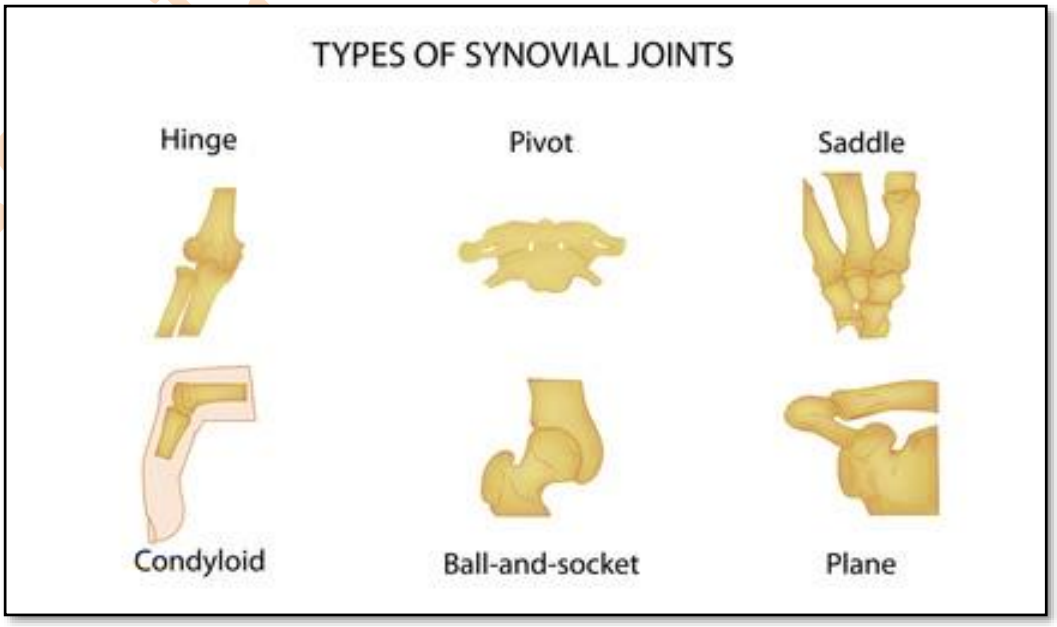
2-Hinge joints: the movement of this joint in one axis such as flexion and extension only.
Example: humero-ulnar joint, and inter –phalangeal joints.

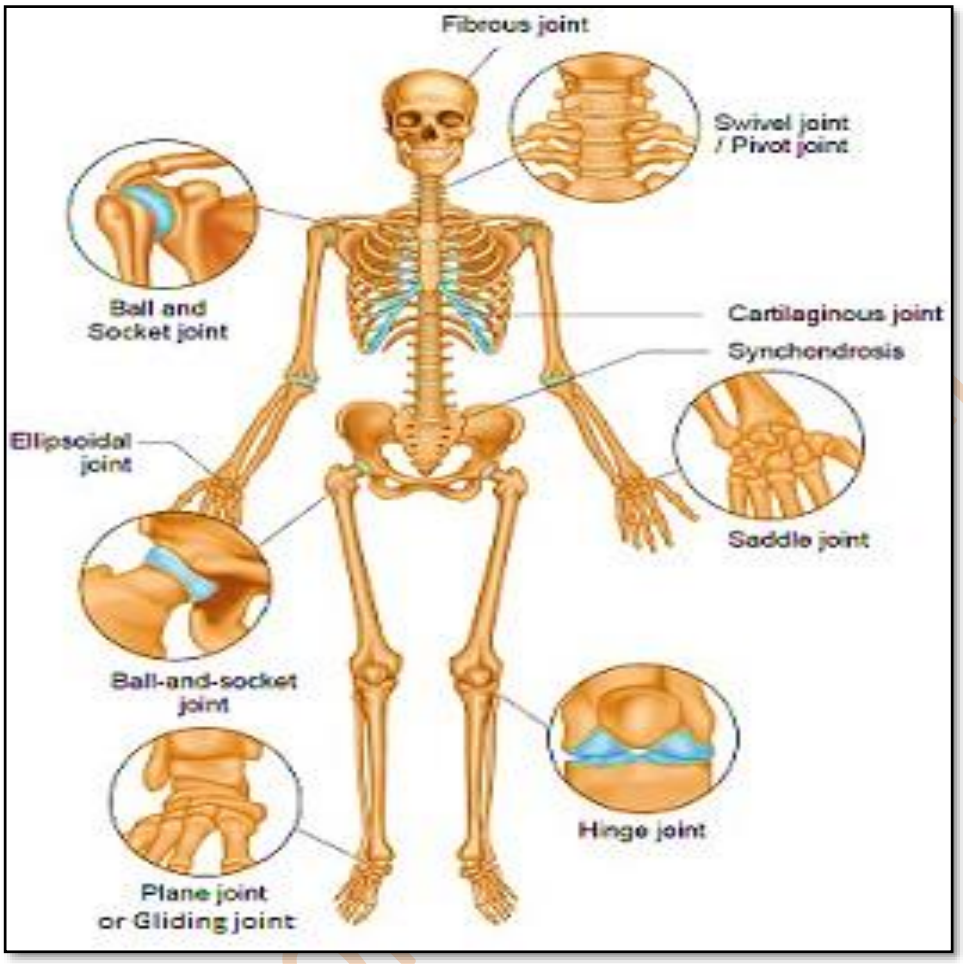
3-Gliding joints (plane joints): in this type articular surface are flat, the movement is gliding.
Example: the joint of the articular process of the vertebra.

4-Condoled joint s: the movement of this joint is abduction and adduction as well as flexion and extension and may be gliding movement. Example: the temporo-mandibular –joint (T.M.J).

5- Pivot joints: the movement of this joint is rotation.
Example: movement of atlas on the odontoid process of axis.

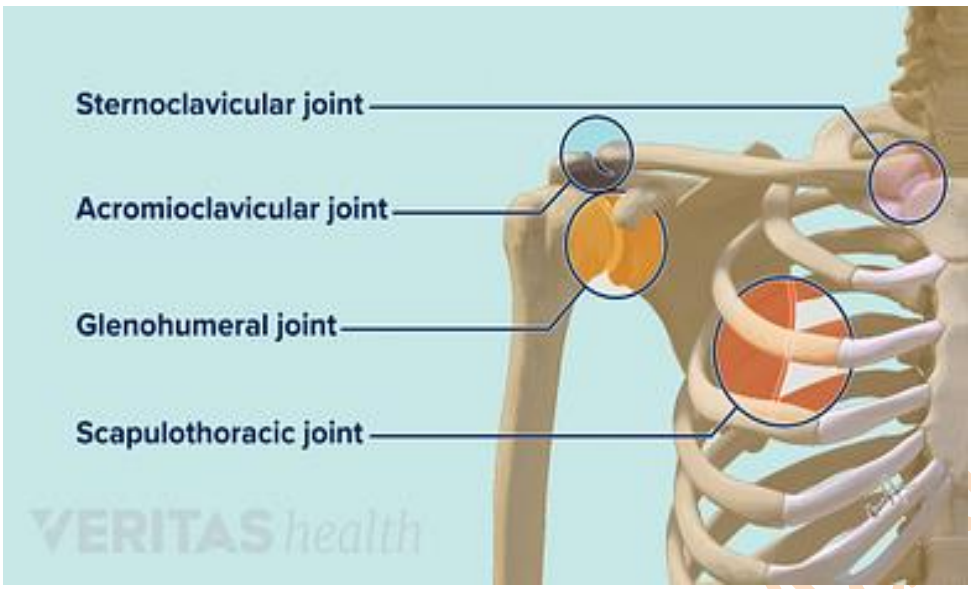
6-Saddle joints: this look like saddle one articular surface is convex in one direction and other surface` is concave in other direction
Example: joint between the trapezium and first metacarpal bone.





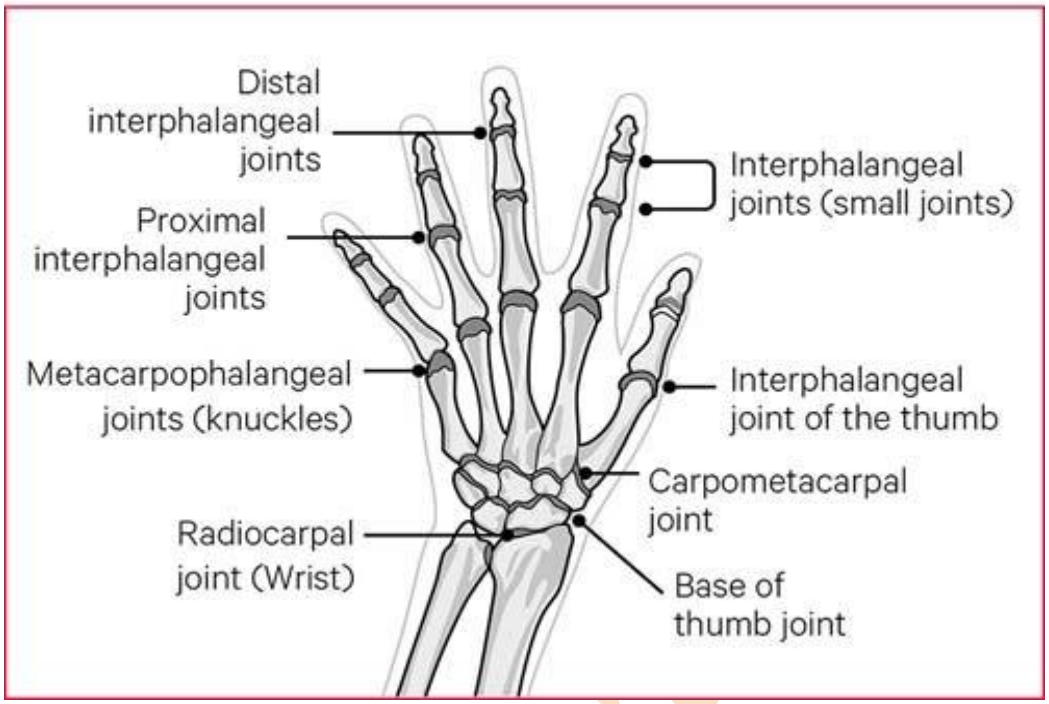
Joints of upper limb:

1. **Joints of shoulder girdle:**
    a. Acromio –clavicular joint: joined the acromial process of scapula with clavicle.
    b. Sterno - clavicular joint: clavicle articulate with upper lacteal side of manubrium of sternum.
2. **Shoulder joints:**
    This joint represents area of the articulation between the head of humerus with glenoid fossa of the scapula.



3. **Elbow joint:**
   This joint represents the area of articulation between the lower end of humerus with upper end of two bone of forearm (radius and ulna).
4. **Radio –ulna joints:**
   Two joints joining the radius and ulna one superiorly and other inferiorly
5. **Joints of the hand:**
   a. Wrist joint: lower end of radius with lunate and scaphoid bone.
   b. Inter –carpal joint: between the carpal bones.
   c. Carpo-metacarpal joint: between the carpal bones and metacarpal bone.
   d. Metacarpo –phalangeal joints: between the metacarpal bone and phalanges.
   e. Inter - phalangeal joints: between phalanges bone.

Joints of the hand and wrist



Quiz / 1
Define joints and enumerate types of the joints.

Quiz / 2
Enumerate types of synovial joints according to the shape of articular surfaces

Quiz / 3
Enumerate joints of hand.

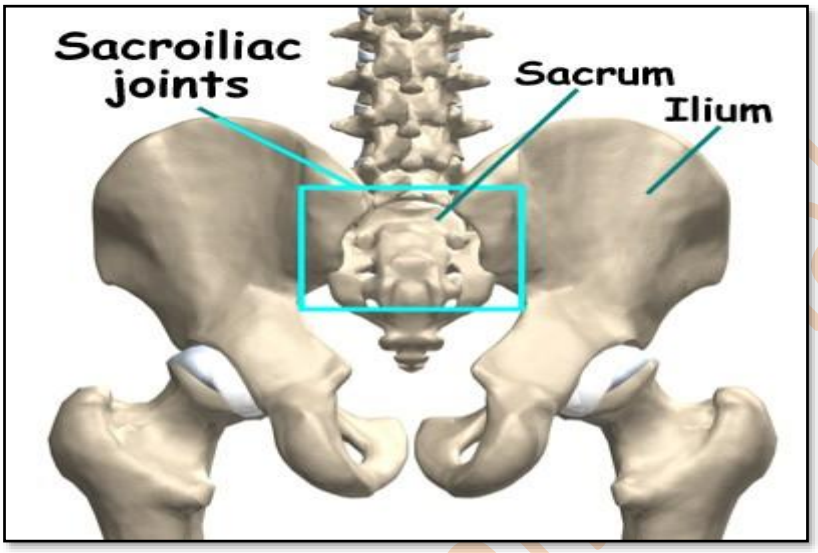
Note: -
-Check your answers in key answer page at the ending of this modular unit.

Joints of lower limb:

1-Joints of pelvic girdle:

a. Sacro –iliac joint: Between the sacral bone and iliac bone.

b. Pubic symphysis: It articulate between the right and left pubic bone.



2-Hip joint:

This joint represents the area of articulation between the head of femur with acetabulum of the hip bone.

3-Knee joint:

This joint between the lower end of femur (two condyles of femur) with upper end of tibia (two condyles of tibia), the fibula not share in this joint

4-Tibio –fibular joints:

This joint between tibia and fibula and they are two one upper and other lower.

5-Joints of foot:

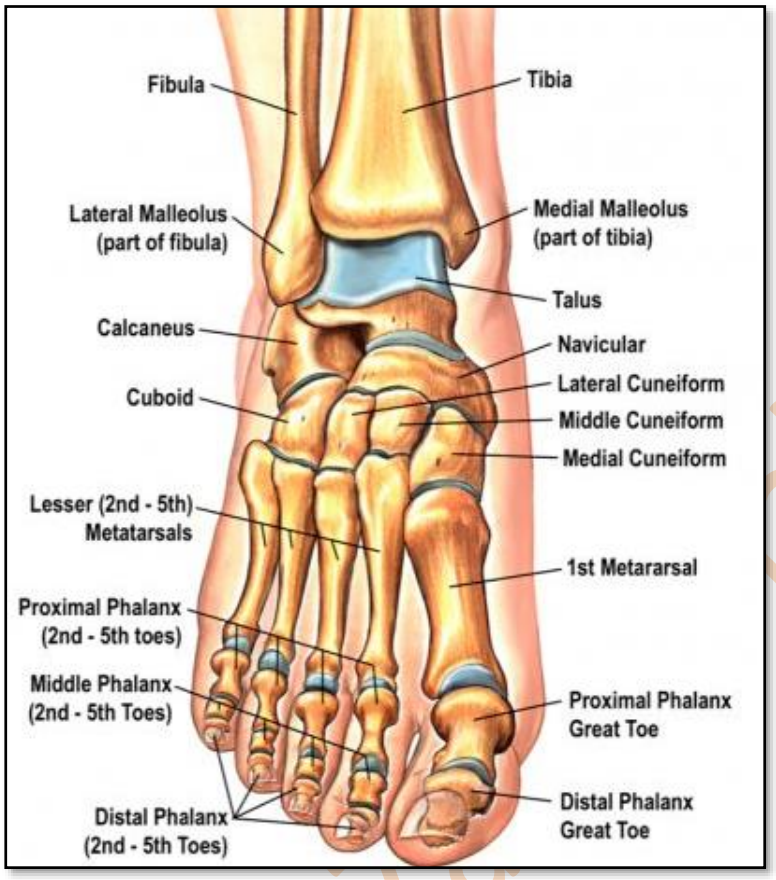
a. Ankle joint: this joint between the both tibia and fibula with talus bone.

b. Inter-tarsal joint: this joint between the tarsal bones.

c. Tarso-metatarsal joint: between the tarsal bones and metatarsal bone.

d. Metatarsao –phalangeal joints:

e. Inter - phalangeal joints: between the phalanges bones.



Joints of the trunk:

1-Joints of the vertebral column:

a. Inter –vertebral joints: between the vertebrae.

b. Joint of the articular processes.

2-Costo –vertebral joints: between the thoracic vertebra and ribs.

Joints of the skull:

1. Sutures.

2. Temporo-mandibular joints (T.M.J): permit the following movement:

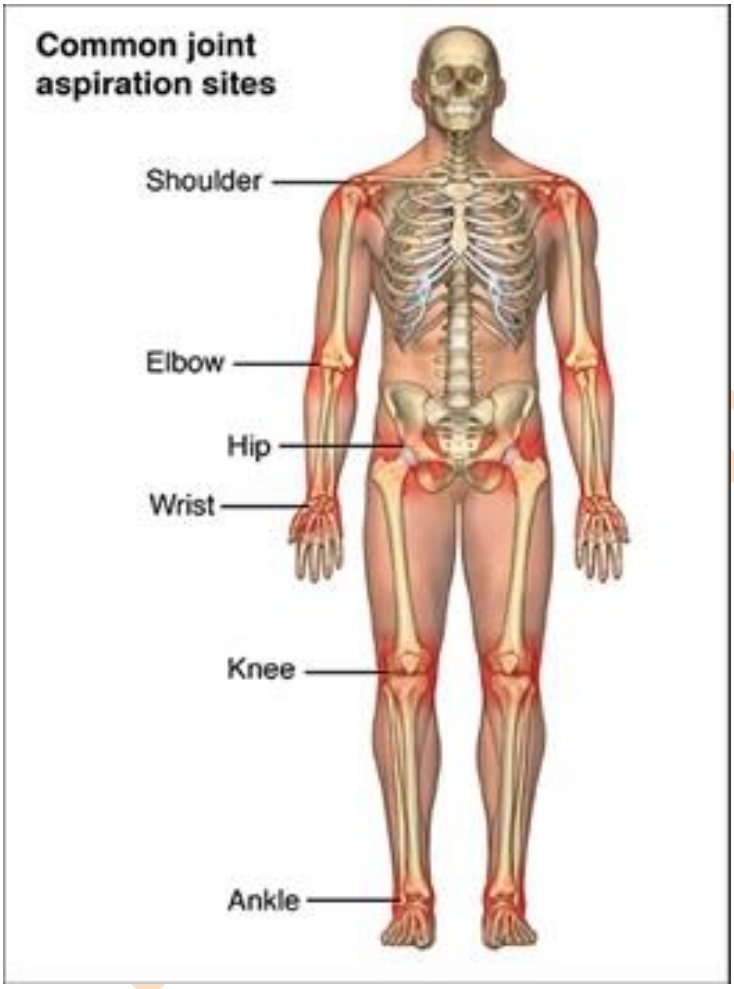
a. depression

b. elevation

c. protrusion.

d. retraction

e. rotation.



Quiz / 4
Enumerate joints of the foot.

Quiz / 5
Enumerate joints of the trunk.

Quiz / 6
Enumerate joints of the skull.

Note: -
-Check your answers in key answer page at the ending of this modular unit.

5/post test

Circle the correct answer of the following: -

Answer with true (T) or false (f) for each of the following statements: -

1-Four types of joint classified according to the degree of movement.

2-Fibrous joint are permitting simple or limited movement.

3-The joint contain synovial fluid called fibro- cartilaginous joint.

4-Example of plane joints is: shoulder joint, hip joint.

5- Saddle joints look like saddle one articular surface is convex in one direction and other surface` is plane in other direction.

6- Metacarpo –phalangeal joints between the metacarpal bone and phalanges.

7-Hip joint represents the area of articulation between the head of femur with acetabulum of the hip bone.

8- Tarso-metatarsal joint: between the tarsal bones and metatarsal bone.

9- Costo –vertebral joints represent the area of articulation between the thoracic vertebra and ribs.

10- Joints of the skull are sutures temporomandibular joints.

Note: -

-Check your answers in key answer page at the ending of this modular unit.

- (1) degree for each.

6/ Key answer

Pre test		Post test
1. T.	Quiz / 1 see page no. 52.	1. F.
2.T.	Quiz / 2 see page no. 52, 53.	2.F.
3. T.	Quiz / 3 see page no. 53.	3. F.
4. T.	Quiz / 4 see page no. 54.	4. F.
5.T.	Quiz / 5 see page no. 54.	5.F.
6.T.	Quiz / 6 see page no. 55.	6.T.
7.T.		7.T.
8. F.		8.T.
9. F.		9.T.
10.F.		10.T.

If you: -
***Got 9 or more you do not need to proceed.**
***Got less than 9you have to study this modular unit very well.**

The fifth modular unit

Muscular system

1 / over view

1/A-Target population: -

This unit Learning package had been designed to the first class students in the community health Dept. KARBALA institute Technology.

1/B-Rationale: -

The muscular system is an organ system consisting of skeletal, smooth and cardiac muscles. It permits movement of the body, maintains posture, and circulates blood throughout the body. The muscular system in vertebrates is controlled through the nervous system, although some muscles (such as the cardiac muscle) can be completely autonomous. Together with the skeletal system it forms the musculoskeletal system, which is responsible for movement of the human body.
There are three distinct types of muscles: skeletal muscles, cardiac or heart muscles, and smooth (non-striated) muscles. Muscles provide strength, balance, posture, movement and heat for the body to keep warm.

1/C-Central Idea: -
1- Muscular system definition.
2-The Origin and the Insertion of muscles.
3- Muscles of the upper limb.
4- Muscles of the lower limb.
5- Muscles of the head.
6- Muscles of the neck.
7- Muscles of the eye ball.

1/D-Instructions: -

1-Study over view thoroughly.
2-Determine the performance objectives.
3-Do the pretest and if you have: -
A-Got 9 or more you do not need to proceed.
B-Got less than 9you have to study this modular unit very well.
4-After studying the text of this modular unit, do the posttest, and if you have: -
A-Got 9 or more, go to the second modular unit.
B-Got less than 9, go back and return to study this modular unit; or any part of it; and then return to perform the posttest again.

2/performance objectives :-

After studying this modular unit, the student will be capable to:
1-Define the muscular system.
2-Know the origin and the insertion of muscles.
3-Mention muscles of the upper limb.
4- Mention muscles of the lower limb.
5- Named muscles of the head.
6- Named muscles of the neck.
7- Named muscles of the eye ball.

3/pre test :-

Circle the correct answer of the following: -
1- Each skeletal muscle connects the bones by …….. Points: -

a- Three.
b- Four
c- Two.
d- Six.

2-One muscle of the muscles of the upper limb is: -
a- Pectoralis major muscle.
b- Bicipital muscle
c- Rhomboid muscle.
d- Teres muscle.

3- Thick triangular muscle covers the shoulder joint called: -
a- Bicipital muscle.
b- Subclavius muscle.
c- Deltoid muscle.
d- Triceps brachii muscle.

4-Insertion of biceps brachii muscle is: -
a- In spine of scapula.
b- bicipital groove of humerus bone.
c- radial tuberosity of radius.
d-In acromial process of scapula.

5- Four small muscles in the medial side of the hand around the little finger called: -
a- Thenar muscles.
b- Palmar muscles.
c- Hypothenar muscles.
c. Palmar muscles.
d- Serratus anterior muscles.

6- Origin of the gluteus medius muscle is: -
a- Outer surface of ileum.
b- Inner surface of ileum.
c- Outer surface of pubic.
d- Inner surface of pubic.

7- Gastrocnemius: consist of …… heads.

a- Two.
b- Three.
c- Four.
d- Fife.

8-Insertion of rectus abdominis muscle:
a- 8^{h}, 9th, 10th costal cartilage, xiphoid process.
b- 7th, 8th, 9th costal cartilage, xiphoid process.
c- 6th, 7th, 8th costal cartilage, xiphoid process.
d- 5th, 6th, 7th costal cartilage, xiphoid process.

9- Suprahyoid muscle is the one muscle of: -
a- Muscles of hand.
b- Muscles of the neck.
c- Muscles of leg.
d- Muscles of the head.

10- One of this muscles is muscle of expression is: -
a- Vastus lateralis muscle.
b- Buccinators muscle.
c- Rhomboid muscle.
d- Vastus medialis.

Note: -
-Check your answers in key answer page at the ending of this modular unit.
- (1) degree for each.

4/ the text:-

Muscular system

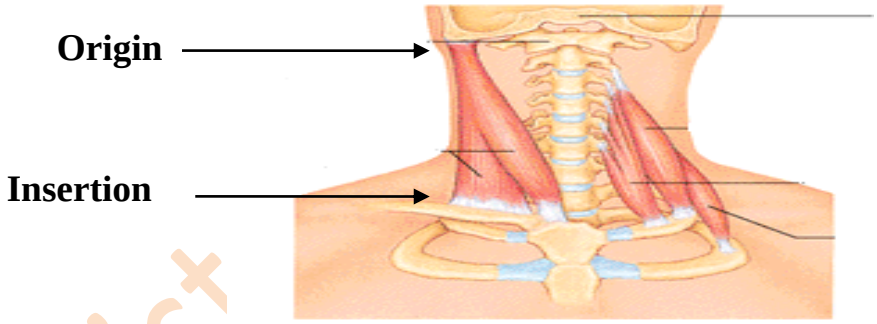
- More than 50% of body weight is muscle!
- And muscle is made up of proteins and water.
- There are about 650 muscles in the human body. They enable us to move, maintain posture and generate heat. In this section we will only study a sample of the major muscles

A Few Fun Facts About Your Muscular System: -

- There muscle in the root of your hair that give you goose bumps.
- It takes (17) muscles to smile and (42) to frown.
- The hardest working muscle is in the eye.
- The largest muscle in your body is the Gluteus Maximus muscle.

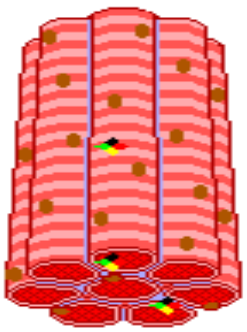
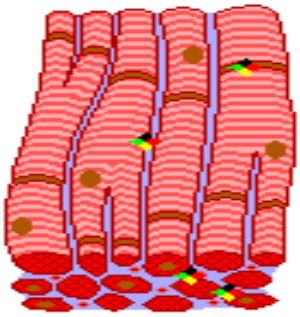
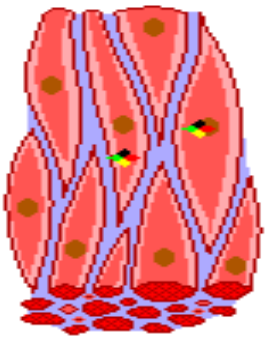
- Muscles are responsible for all movement of the body.
- Only body tissue able to contract
- create movement by flexing and extending joints
- Body energy converters (many muscle cells contain many mitochondria)

One of the functions of the body is the movement that is done by the joints and the skeletal muscles which are cover the skeleton and it is voluntary muscles. Each skeletal muscles connects the bones by two points. The first one called origin of the muscle and the second one called the insertion of the muscle.



Types of Muscles

- **There are three basic types of muscle**
  - ***Skeletal***
  - ***Cardiac***
  - ***Smooth***


Skeletal **Cardiac** **Smooth**

Classification of Muscle

Skeletal Muscle	Cardiac Muscle	Smooth Muscle
found in limbs	found in heart	Found in viscera
Striated, multi- nucleated	Striated, 1 nucleus	Not striated, 1 nucleus
voluntary	involuntary	involuntary

Characteristics of Muscle

- Skeletal and smooth muscle are elongated
- Muscle cell = muscle fiber
- Contraction of a muscle is due to movement of *microfilaments* (protein fibers)
- All muscles share some terminology

- Prefixes *myo* and *mys* refer to muscle
- Prefix *sarco* refers to flesh

Shapes of Muscles

- Triangular- shoulder, neck
- Spindle- arms, legs
- Flat- diaphragm, forehead
- Circular- mouth, anus

Muscle Control

Type of muscle	Nervous control	Type of control	Example
Skeletal	Controlled by CNS	voluntary	Lifting a glass
Cardiac	Regulated by ANS	involuntary	Heart beating
smooth	Controlled by ANS	involuntary	Peristalsis

- **Muscles of the upper limb:**

1. <u>Muscles connect the upper limb with the vertebral column:</u>

a. Trapezius muscle.
b. Latissimus dorsi muscle.
c. Rhomboid muscle.
d. Levator scapulae muscle.

Trapezius muscle: Large muscle covers of the neck and upper of the back from posterior.

Origin: occipital bone, spine of 7th cervical vertebra, spines of all thoracic vertebrae.

Insertion: upper Part: inserted in lateral third of the clavicle.
M idle part: inserted in acromial process of scapula.
Lower part: inserted in spine of scapula.

Latissimus dorsi muscles: Large triangular muscle covers the lumber region and lower part of the back.

Origin: posterior part of the iliac crest, spines of lowers six thoracic vertebrae, lumber fascia.

Insertion: bicipital groove of humerus bone.

2. Muscles connect the upper limb with thoracic cage:

a. Pectorals major.
b. Pectorals minor.
c. Subclavius muscle.
d. Serratus anterior muscle.

Pectorals major: thick triangular muscle in the upper of chest.
Origin: clavicle, sternum, upper six costal cartilages.
Insertion: bicipital groove of humerus bone.
Pectorals minor: small triangular muscle lies behind the pectorals major
Origin: 3^{th}, 4^{th}, 5^{th} ribs.
Insertion: coracoids process of the scapula.

3. Muscles of the shoulder:

a. Deltoid muscle.
b. Supraspinatus muscle.
c. Infra spinatus muscle.
d. Sub scapulars muscle.
e. Teres muscle.

Deltoid muscle: thick triangular muscle covers the shoulder joint.
Origin: lateral third of the clavicle, acromial process of the scapula, spine of the scapula.
Insertion: deltoid tuberosity in the middle of humerus bone.

4. Muscles of the upper arm:

A. anterior muscles:

a. Coraco- brachialis muscle.
b. Brachialis muscle.
c. Biceps brachii muscle.

B. posterior muscle.

-Triceps brachii muscle.

Biceps brachii muscle: long spindle muscle covers the anterior part of the arm, and has two head long and short head.
Origin: long head: glenoid cavity of the scapula.
Short head: coracoid process of the scapula.
Insertion: radial tuberosity of radius.

5. Muscles of the fore arm

A: anterior muscles: group of the muscle has one origin and one insertion

a. Flexor carpi radialis.
b. Flexor carpi ulnaris. } (Flexor muscles)
c. Palmaris longus.

Origin: medial epicondyle of humerus.
Insertion: lower end of radius and bones of hand.

B: Posterior muscles: group of the muscle has one origin and one insertion:

a. Brachioradialis muscle
b. Extensor carpiradialis muscle
c. Extensor carpi ulnaris muscle } (extensor muscles)
d. Extensor digitorum muscle

Origin: lateral epicondyle of humerus.
Insertion: lower end of radius and bones of hand.

6.Muscles of the hand:

a. Thenar muscles.
b. Hypothenar muscles.
c. Palmar muscles.

Thenar muscle: four small muscles in the lateral side of the hand around the thumb and form the thenar eminence.

Hypothenar muscle: four small muscles in the medial side of the hand around the little finger and form the hypothenar eminence.

Quiz / 1
Mention muscles connect the upper limb with thoracic cage.

Quiz / 2
Mention the origin and insertion of the extensor muscles of the fore arm.

Note: -
-Check your answers in key answer page at the ending of this modular unit.

-Muscles of the lower limb: -

1-**Muscles of the gluteal region:**

1. Muscles gluteal region:

a. Gluteus maximus.

b. Gluteus medius.

c. Gluteus minimus.

Gluteus maximus: is large thick muscle lies in the superficial of the gluteal region.

Origin: outer surface of ileum, sacrum, and coccyx.

Insertion: gluteal tuberosity of the femur.

Gluteus medius: deep to gluteus maximus } **Origin**: outer surface of ileum
Gluteus minimus: deep to gluteus medius } **Insertion** greater trochanter of femur.

2. Muscles of the thigh:

A. anterior muscles:

a. Sartorius.

b. Quadriceps femurs.

Sartorius: is narrow strap –shaped muscle in the anterior part of the thigh

Origin: anterior superior iliac spine.

Insertion: shaft of the tibia.

Quadriceps femurs: Cover the anterior, medial and lateral femur, consist of four parts:

1. Rectus femoris.
2. Vastus lateralis muscle.
3. Vastus medialis.
4. Vastus intermedius.

B. Posterior muscles of the thigh:

a. Biceps femoris.

b. Semitendinosus.

c. Semimembranosus.

3. Muscles of leg:

A. anterior muscles:

a. Tibialis anterior muscle.

b. Extensor digitorum longus.

B. Posterior muscles:

a. Gastrocnemius.

b. Soleus.

Gastrocnemius: consist of two heads.

Origin: shaft of tibia and fibula.

Insertion: posterior of calcaneus.

4.Muscles of foot:

Planter muscle: group of the muscle arranged in four layers in the sole of foot.

Quiz / 3

Enumerate muscles of the gluteal region.

Quiz / 4

Mention the origin and insertion of the Sartorius muscle.

Note: -

-Check your answers in key answer page at the ending of this modular unit.

-Muscles of the abdomen:

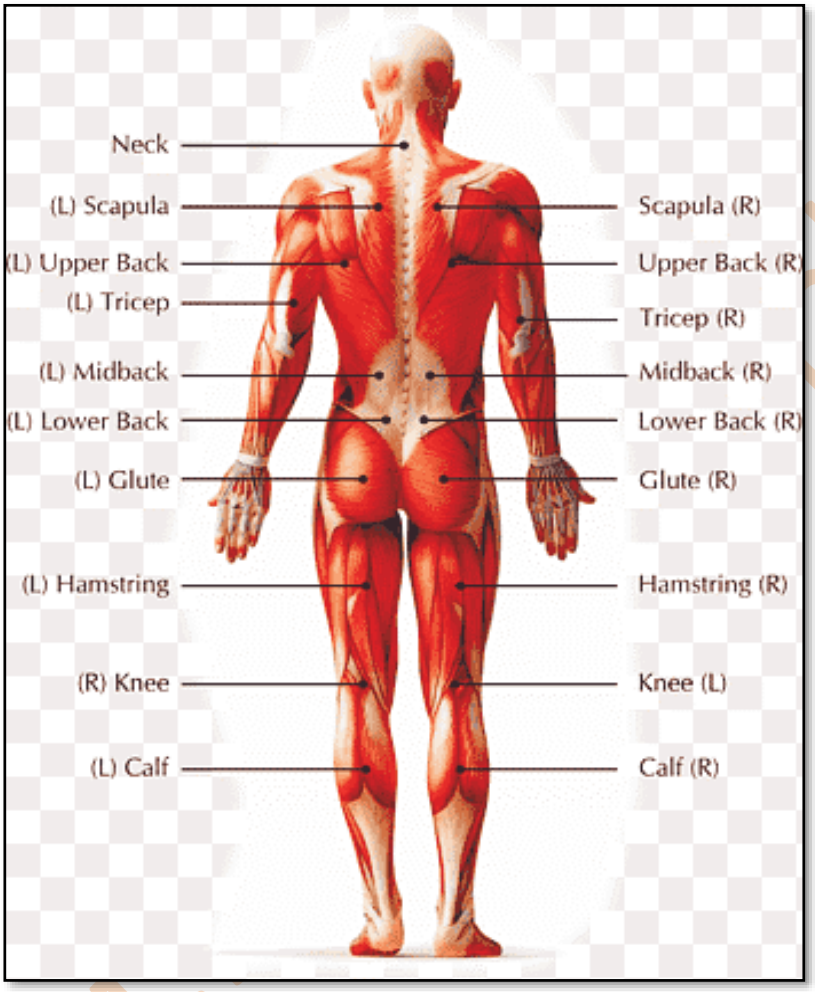
1. External oblique muscle.
2. Internal oblique muscle.
3. Trans versus abdominis muscle.
4. Rectus abdominis muscle.
5. Pyramidalis muscle.

Trans versus abdominis muscle: flat muscle extends horizontally from the lateral to the anterior wall of the abdomen.

Origin: lower six costal cartilages, lumber fascia, and iliac crest.

Insertion: xiphoid process, linea alba, symphysis pubis.

<u>Rectus abdominis muscle:</u> long strap muscle in the anterior abdominal wall near the midline.
Origin: front of symphysis pubis, pubic crest.
Insertion: 5th, 6th, 7th costal cartilage, xiphoid process.



Muscles of the head and neck

A- Muscles of the head:

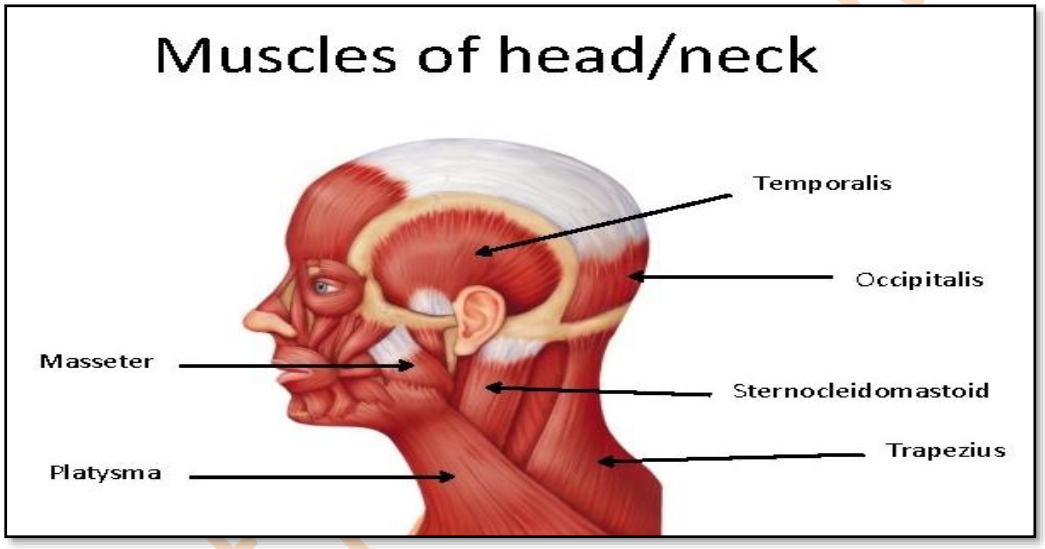
1. **Muscles of the expression:**
   a. Occipitofrontalis muscles.
   b. Buccinators muscles.
   c. Orbicularis oris muscle.
   d. Orbicularis oculi muscle.
2. **Muscles of the mastication:**
   a. Masseter muscle.
   b. Temporalis muscle.
   c. Ptrygoid muscle.

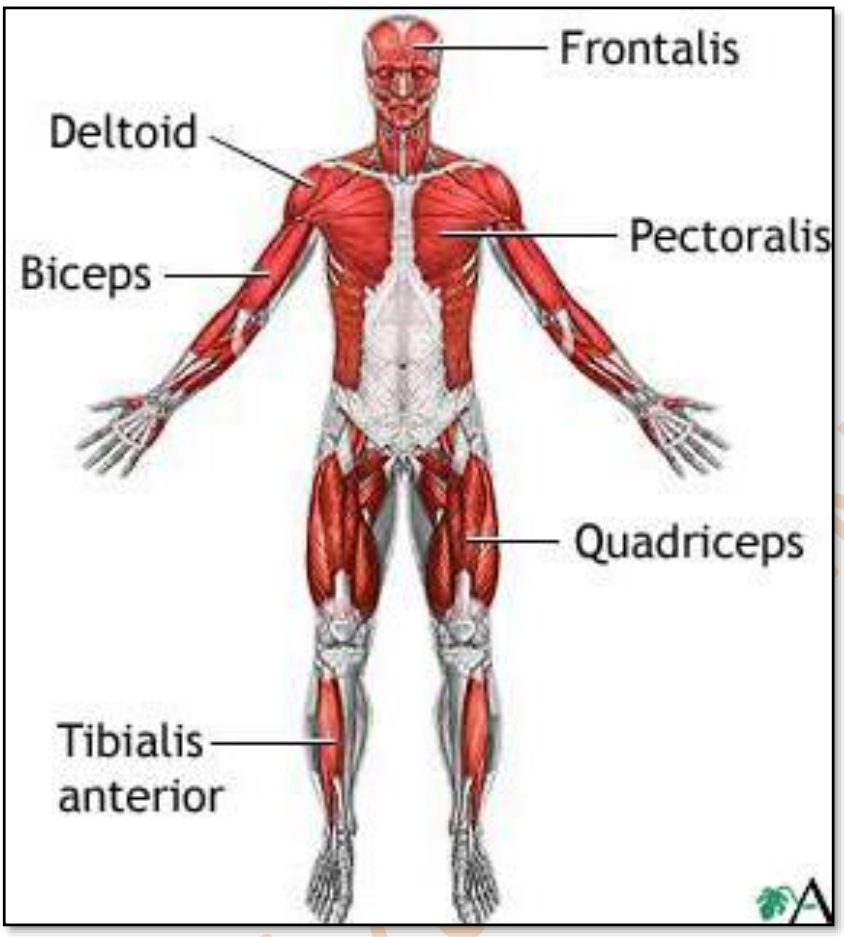
B- Muscles of the neck:

a. Platysma.
b. Sterno-Cleido-Mastoid muscle.
c. Supra-Hyoid muscle.
d. Infra-Hyoid muscle.

C-Muscles of the eye ball:

a. Superior rectus muscle.
b. Inferior rectus muscle.
c. Medial rectus muscle.
d. Superior oblique muscle.
e. Inferior oblique muscle.





Quiz / 5
Define transversus abdominis muscle.

Quiz / 6
Enumerate muscles of the mastication.

Quiz / 7
Enumerate muscles of the eye ball.

Note: -
-Check your answers in key answer page at the ending of this modular unit.

5/post test

Answer with true (T) or false (f) for each of the following statements: -

1- Skeletal muscles which are cover the skeleton and it is voluntary muscles.
2- Levator scapulae muscle is one muscle of the upper limb muscles.

3- Posterior group muscles of for arm are flexor muscles.
4- Pectoralis major is a thick triangular muscle in the upper of abdomen.
5- Thenar muscle are four small muscles in the medial side of the hand.
6- A large thin muscle lies in the superficial of the gluteal region called gluteus maximus.
7- Quadriceps femoris muscle consists of four parts.
8- Muscles of leg consist of anterior and posterior group.
9- One example of the muscles of abdomen is internal oblique muscle.
10-Inferior rectus muscle is one of the muscles of neck.

Note: -
-Check your answers in key answer page at the ending of this modular unit.
- (1) degree for each.

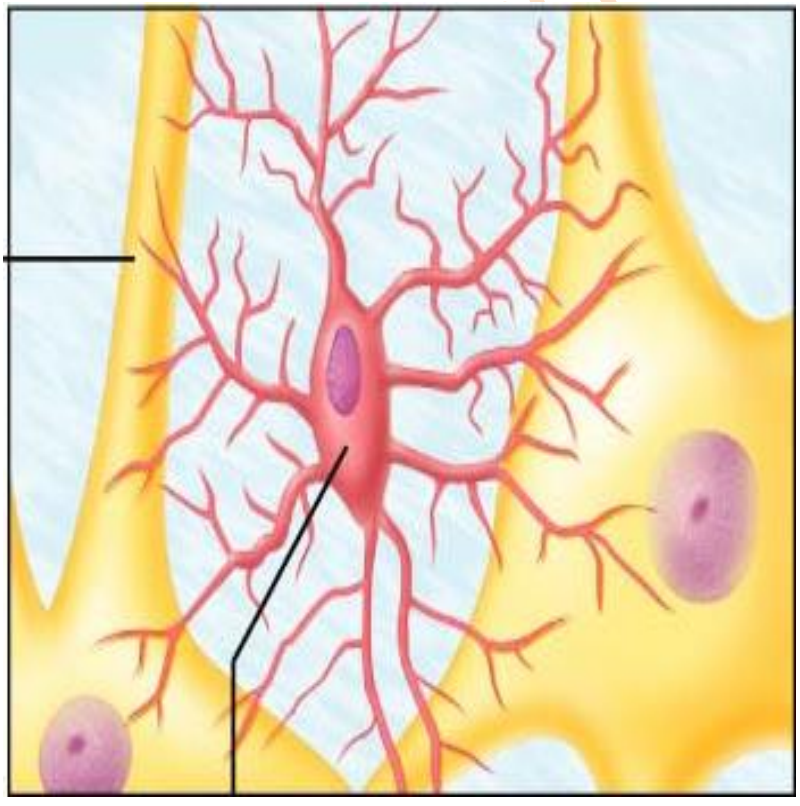
6/ Key answer

Pre test		Post test
1. c.	Quiz / 1 see page no. 61.	1. T.
2.c.	Quiz / 2 see page no. 63.	2.T.
3. c.	Quiz / 3 see page no. 64.	3. F.
4. c.	Quiz / 4 see page no. 64.	4. F.
5.c.	Quiz / 5 see page no. 65.	5.F.
6.a.	Quiz / 6 see page no.66.	6.F.
7.a.	Quiz / 7 see page no. 66.	7.T.
8. d.		8.T.
9. b.		9.T.
10. b.		10.F.

If you: -
***Got 9 or more you do not need to proceed.**
***Got less than 9you have to study this modular unit very well.**

The sixth modular unit

Nervous System



1 / over view

1/A-Target population: -

This unit Learning package had been designed to the first class students in the community health Dept. KARBALA institute Technology.

1/B-Rationale: -

The nervous system allows us to perceive, comprehend, and respond to the world around us. The nervous system also operates the body's essential physiologic functions, such as breathing and digestion. The nervous system is the part of an animal's body that coordinates its actions and transmits signals to and from different parts of its body.

1/C-Central Idea: -

1- Neurons definition.
2- The nervous system divided.
3- The central nervous system consistence.
4- The brain consistence.
5- The spinal cord consistence.
6- Peripheral nervous system consistence.
7- Spinal nerves.
8-Cranial nerves
8- Nerve plexus.

1/D-Instructions: -

1- Study over view thoroughly.
2-Determine the performance objectives.
3-Do the pretest and if you have: -
A-Got 7 or more you do not need to proceed.
B-Got less than 7you have to study this modular unit very well.
4-After studying the text of this modular unit, do the posttest, and if you have: -
A-Got 7 or more, go to the second modular unit.
B-Got less than 7, go back and return to study this modular unit; or any part of it; and then return to perform the posttest again.

2/performance objectives :-

After studying this modular unit, the student will be capable to:
1-Define the neurons.
2- Describe the structure and function of a nerve cell (neuron).
3-Differentiate between the central and peripheral nervous systems.
4-Subdivide the peripheral nervous system into smaller groupings.
5- Divided the brain.
6-Divided the spinal cord.
7- Named the spinal nerves.
5- Named the cranial nerves.

3/pre test :-

Circle the correct answer of the following: -
1- The nervous system divided into: -
a- Sympathetic & autonomic nervous system.
b- Central & sympathetic nervous system.
c- Central & somatic nervous system.
d- Somatic & autonomic nervous system.

2- The brain consists of: -
a- Cerebellum, hypothalamus& Brain stem.
b- Cerebrum, Brain stem & hypothalamus.
c- Cerebrum& Cerebellum& hypothalamus.
d- Cerebrum& Cerebellum& Brain stem.

3- Grey matter: is outer layer also called: -
a- Cerebellar membrane.
b- Cerebellar sulcus.
c- Cerebellar cortex.
d- Cerebellar fissure.

4- The brain and spinal cord covered by 3 membranes called…… :-
a- Grey matter.
b- Meanings.
c- Inner layer.
d- White matter.

5- The spinal cord consists of ……. horns: -
a- Four.
b- Six.
c- Eight.
d- Tow.

6- Peripheral nervous system consists of: -.
a- Cranial& Spinal nerves.
b- Spinal & Cervical nerves.
c- Cerebellar & Spinal nerves.
d- Cranial, Spinal &Cervical nerves.

7-Axillary nerve, Radial nerve, Ulnar nerve, Median nerve are branches of: -.
a- Thoracic plexus.
b- Brachial plexus.
c- Lumber plexus.
d- Lumbosacral plexus.

8- Optic nerve function is: -
a- Vision.
b- smell.
c- hear.
d- taste.

Note: -
-Check your answers in key answer page at the ending of this modular unit.
- (1) degree for each.

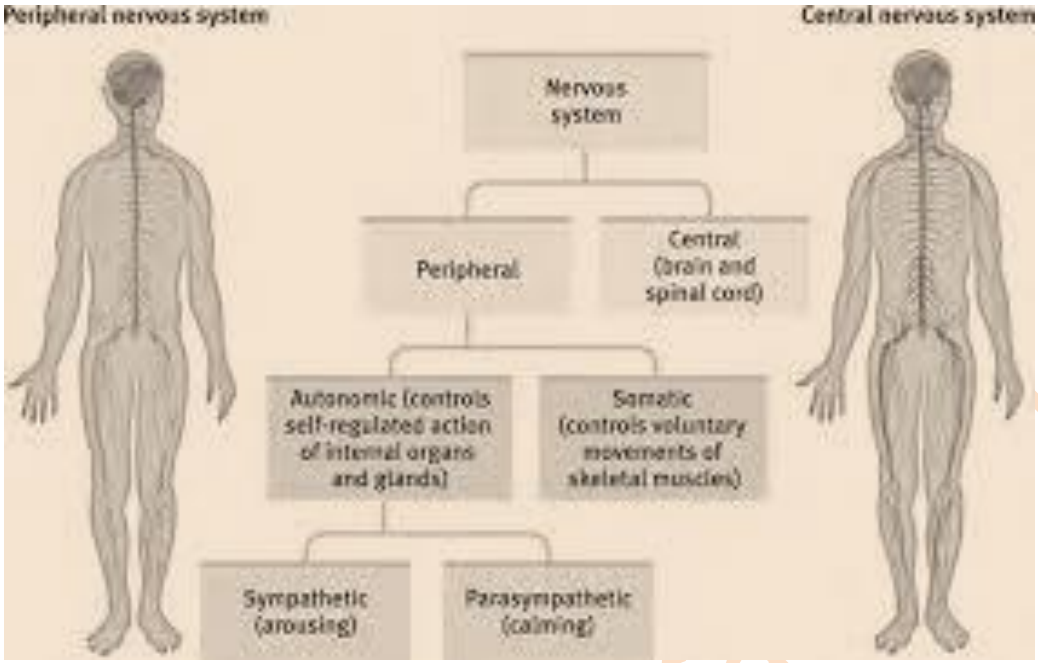
4/ the text:-

The nervous system

The nervous system consists of units called neurons.
Neurons: is nerve cell and its processes which is axon and dendrites.
The nervous system divided into:

I. Somatic nervous system:
1. Central nervous system.
2. Peripheral nervous system.

II. Autonomic nervous system:
1. Sympathetic nervous system.
2. Parasympathetic nervous system.



1.Central nervous system: Consist of:

a. Brain.

b. Spinal cord.

- The brain and spinal cord covered by 3 membranes called meanings:

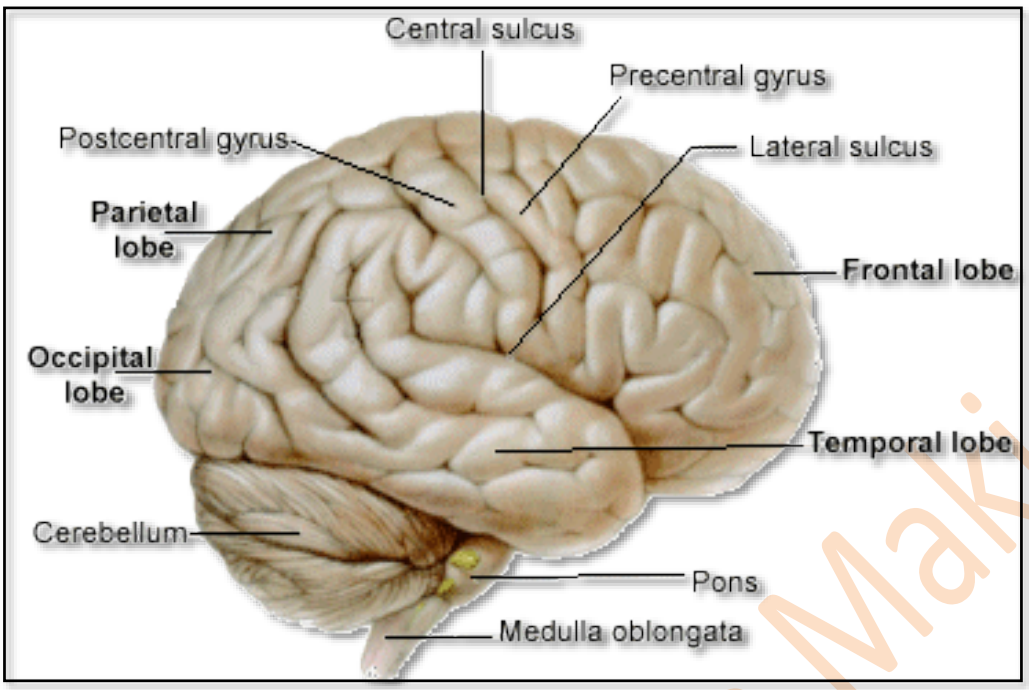
a. Dura mater.
b. Arachnoids mater.
c. Pia mater.

<u>The brain: Consists of:</u>

i. Cerebrum: it consists of two half ball each one called cerebral hemisphere located in the anterior and middle cranial fossa.

<u>Cerebral hemisphere consists of 4 lobes:</u>

a. Frontal lobe.
b. Parietal lobe.
c.Temporal lobe.
d.Occipital lobe.



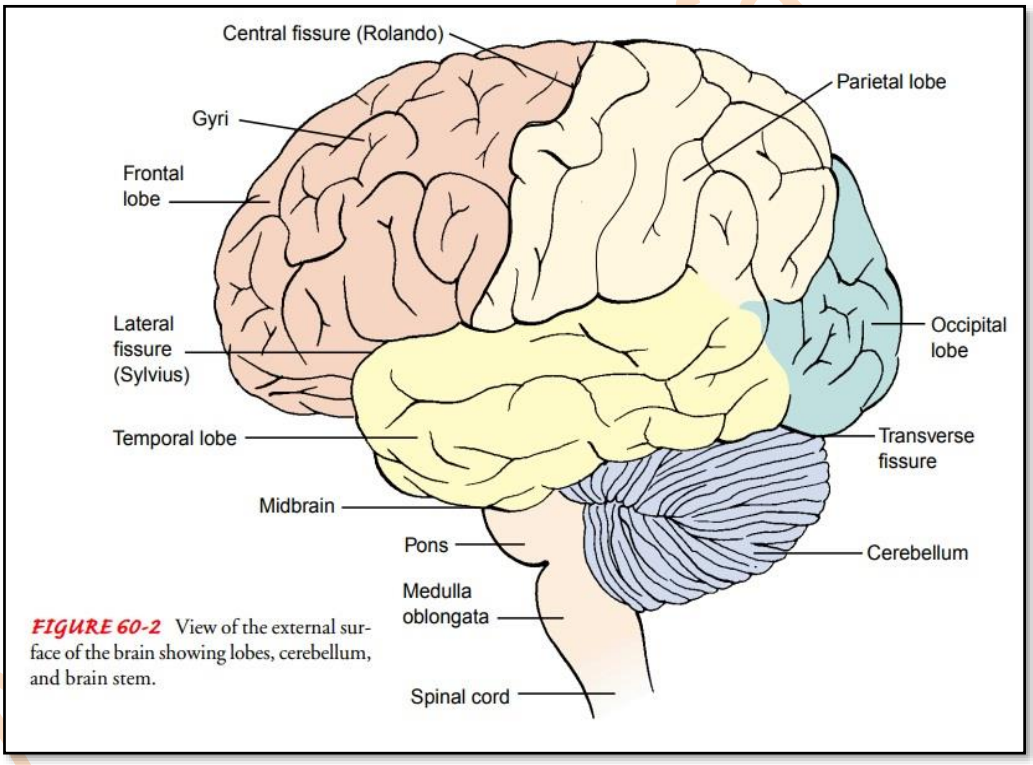


FIGURE 60-2 View of the external surface of the brain showing lobes, cerebellum, and brain stem.

- Cerebrum consists of two layers:

1. **Grey matter:** (cerebral cortex) outer layer consist of nerve cells.
2. **White matter:** Inner layer contains nerve fibers and ganglion:
   a. Basal ganglion.
   b. Thalamus.
   c. Hypothalamus.

ii. **Cerebellum:** two half ball called cerebellar hemispheres one in each side located in posterior cranial fossa. It consists of two parts:

1. Grey matter: is outer layer also called cerebellum cortex.
2. White matter: is inner layer.

iii. **Brain stem:**

a. mid brain.

b. Pons.

c. medulla oblongata.

The spinal cord: -

it located inside the vertebral canal and consists of segments called spinal segments the same numbers of vertebrae (cervical, thoracic, lumber, sacral and coccyx vertebrae) give 31 pairs of spinal nerves (8cervical ,12 thoracic ,5 lumber ,5 sacral and 1 coccyx spinal nerves). each spinal segment gives pair of the spinal nerves (right and left).

It consists of two parts:

1. White matter: is outer layer.
2. Grey matter: is inner layer.

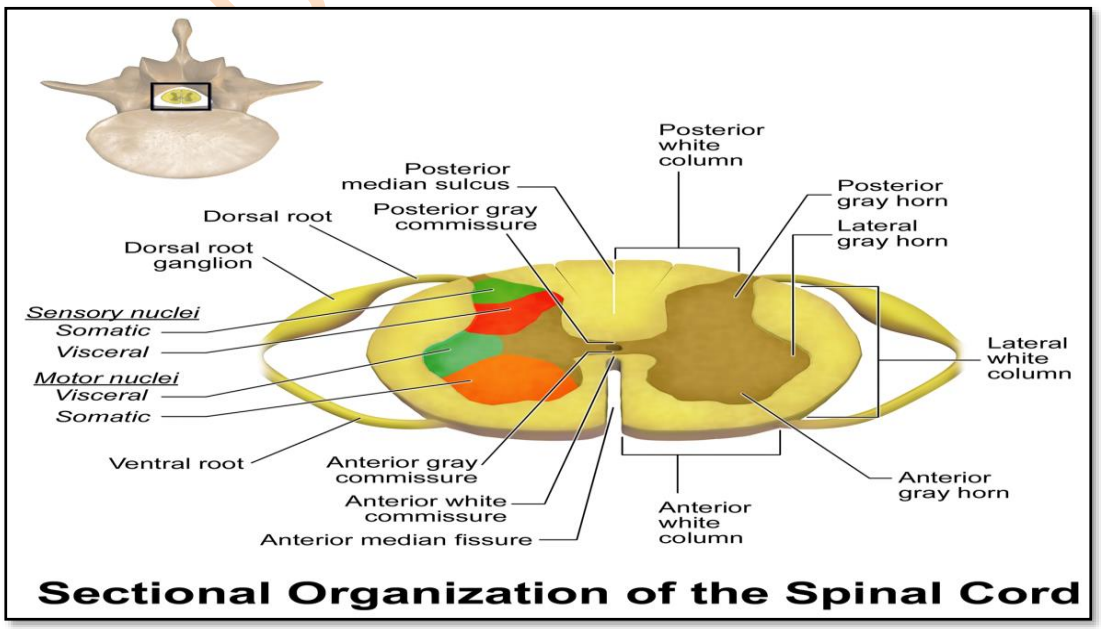
It consists of four horns:

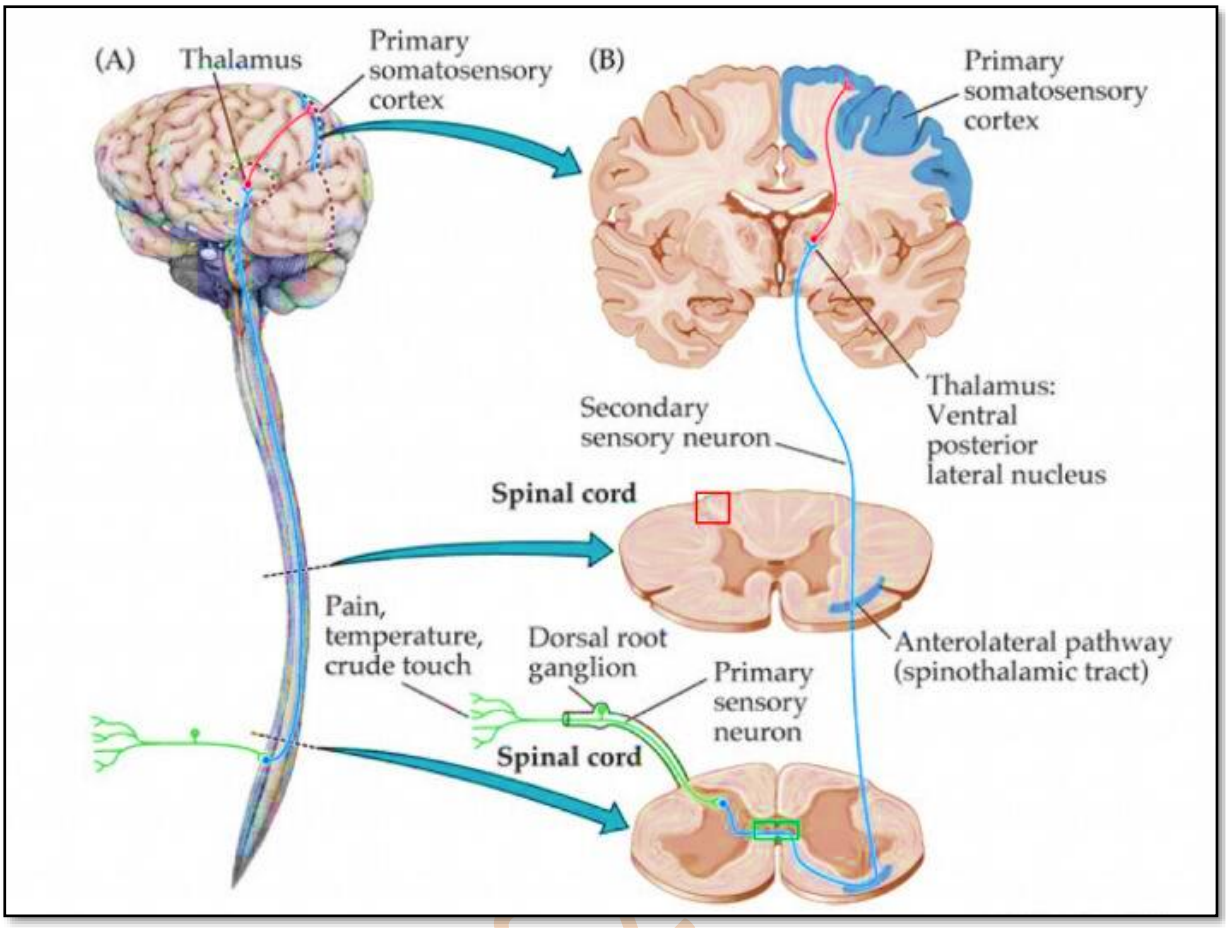
a. 2anterior horns: motor nerve cell.

b. 2 posterior horns: sensory nerve cell.

The spinal cord divided into two parts by:

1. Anterior median sulcus or fissure.
2. Posterior median sulcus.





Quiz /1
Define neurons and mention the divided of the nervous system.

Quiz /2
Enumerate the lobes cerebral hemisphere.

Quiz / 3
Explain the spinal cord.

Note: -
-Check your answers in key answer page at the ending of this modular unit.

2. Peripheral nervous system:

It consists of: -
1-Cranial nerves.
2-Spinal nerves.

Cranial nerves and function

No	Nerve	Type	Function
1.	Olfactory nerves	Sensory	Smell
2.	Optic nerve	Sensory	Vision
3.	Oculomotor nerve	Motor	Movement of the external muscles of eyeball except superior oblique and lateral rectus muscle
4.	Trochlear nerve	Motor	Superior oblique muscle
5.	Trigeminal nerve	Mixed	Sensory –mouth (lip, teeth, gum)- face - anterior half of scalp. - motor muscle of mastication
6.	Abducent nerve	Motor	Lateral rectus muscle
7.	Facial nerve	Mixed	Motor –muscle of expression of face sensory-taste of anterior 2/3of tongue
8.	Auditory nerve (vestibulo-Cochlear)	Sensory	Hearing -Equilibrium
9.	Glossopharyngeal nerves	Mixed	Motor-muscles of pharynx Sensory –posterior 1/3of tongue
10.	Vagus nerves	Mixed	Motor-muscle of pharynx, larynx upper part of the esophagus. sensory –trachea, lung.
11.	Accessory nerve	Motor	Sterno-Cleido-Mastoid & Trapezius muscle
12.	Hypoglossal nerve	Motor	Muscle of tongue movement

2. Spinal nerves:

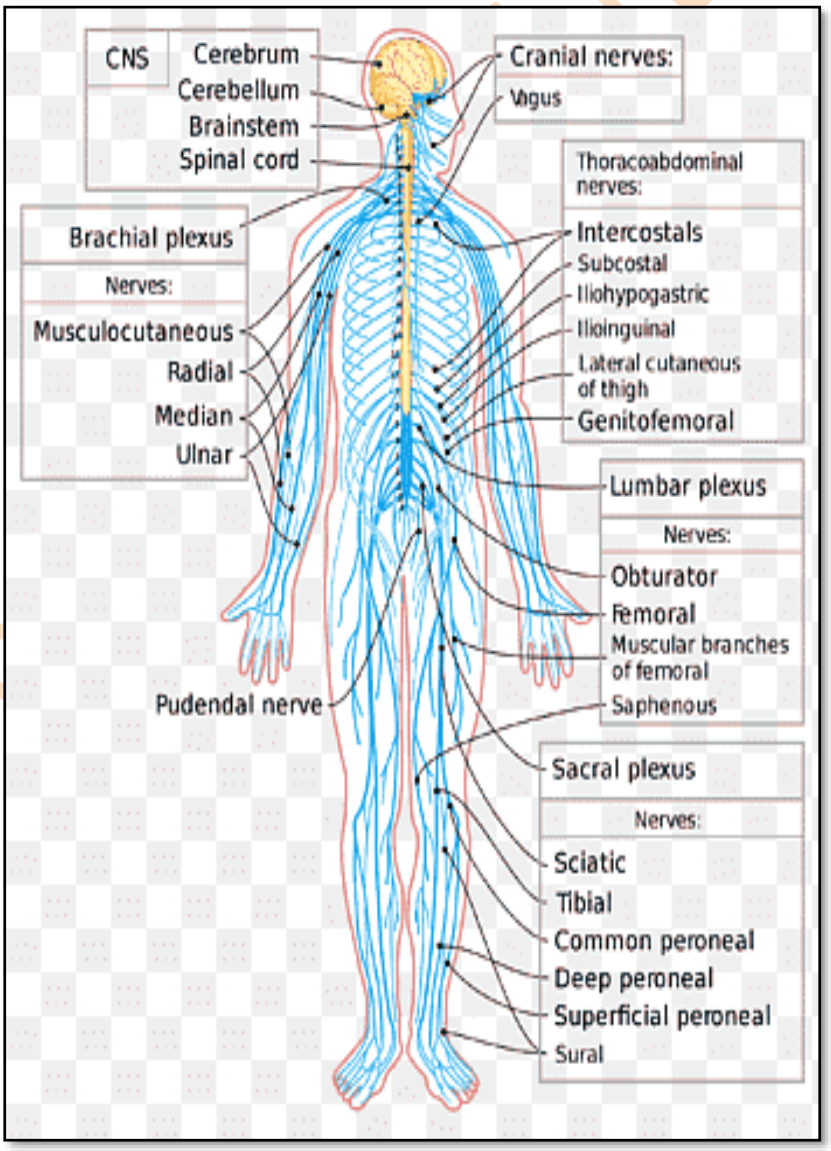
31pairs of nerves from the spinal cord:

1. Cervical nerves: 8 pairs of cervical nerves supply the upper limbs.
2. Thoracic nerves: 12pairs of thoracic nerves supply thoracic and upper part of abdomen.
3. Lumber nerves: 5pairs of lumber nerves supply lower part of abdomen and part of the lower limb.
4. Sacral nerves: 5 pairs of sacral nerves supply lower limb and muscles of pelvis.
5. Coccygeal nerves: 1pairs.

Nerve plexus:

1. **Cervical plexus:** upper 4 cervical nerves give branch called phrenic nerve
2. **Brachial plexus:** lower 4 cervical nerves give the following branches:
   a. Axillary nerve.
   b. Radial nerve.
   c. Ulnar nerve.
   d. Median nerve.

3. **Lumbosacral plexus:** lumber and sacral nerves , give the following branches :
   a. Femoral nerve.
   b. Obturator nerve.
   c. Sciatic nerve.



Quiz / 4
Mention the spinal nerves.

Quiz / 5
Enumerate the brachial plexus branches.

Note: -
-Check your answers in key answer page at the ending of this modular unit.

5/post test

Answer with true (T) or false (f) for each of the following statements: -

1- The nervous system consists of units called neurons.
2- Autonomic nervous system consists of: Sympathetic nervous system& Parasympathetic nervous system.
3- Basal ganglion, thalamus& hypothalamus are the ganglion of cerebrum.
4- Brain stem consists of: mid brain, Pons & medulla oblongata.
5- White matter: is the outer layer in the brain and spinal cord.
6- Sacral nerves: 5pairs of lumber nerves supply lower part of abdomen and part of the lower limb.
7- Obturator nerve: it is a branch of brachial plexus.
8- Motor is the type of trochlear nerves.

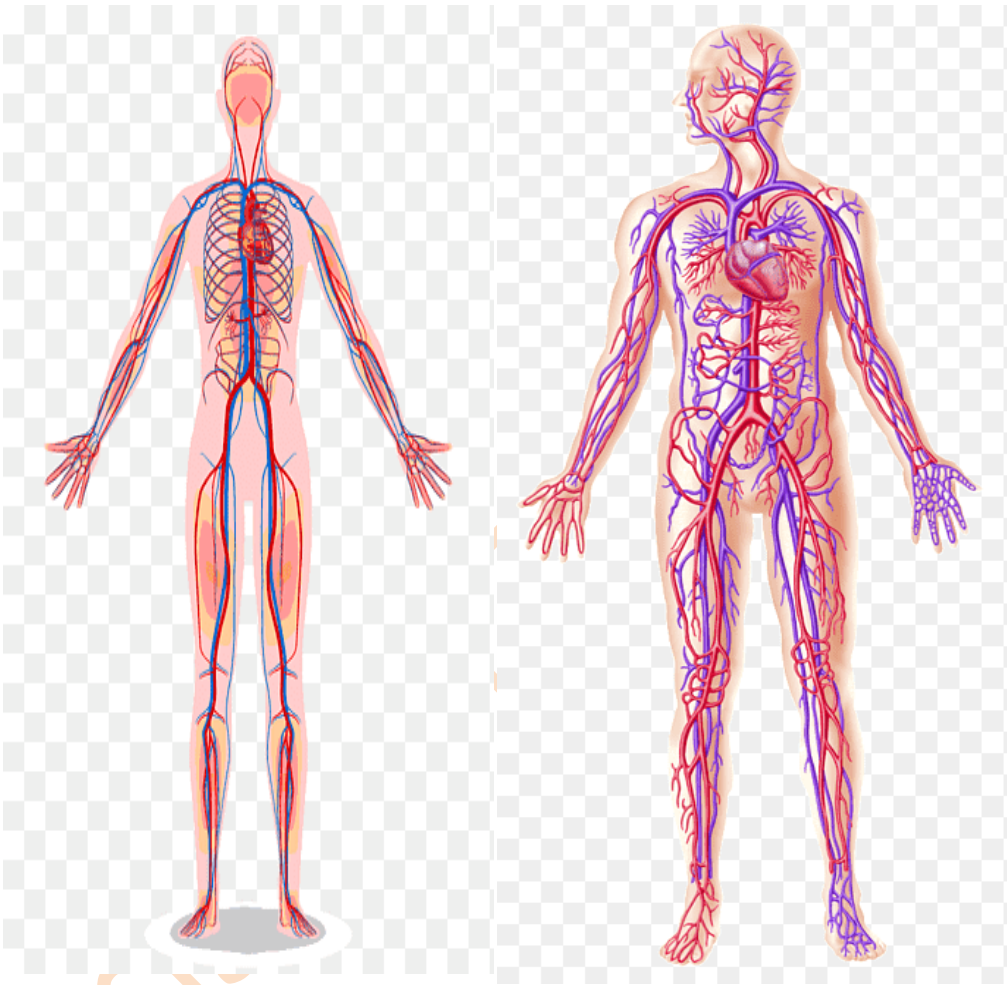
Note: -
-Check your answers in key answer page at the ending of this modular unit.
- (1) degree for each.

6/ Key answer

Pre test		Post test
1. d.	Quiz / 1 see page no. 73.	1. T.
2.d.	Quiz / 2 see page no.73.	2.T.
3. c.	Quiz / 3 see page no. 74.	3. T.
4. b.	Quiz / 4 see page no.74,75.	4.T.
5.a.	Quiz / 5 see page no. 75.	5.F.
6.a.		6.F.
7.b.		7.F.
8. a.		8.T.

If you: -
***Got 7 or more you do not need to proceed.**
***Got less than 7 you have to study this modular unit very well.**

The seventh modular unit



Circulatory System

1 / over view

1/A-Target population: -

This unit Learning package had been designed to the first class students in the community health Dept. KARBALA institute Technology.

1/B-Rationale: -

Circulatory system (the cardiovascular system and lymphatic system) Combined helps to fight off disease, helps the body maintain a normal body temperature, and provides the right chemical balance to provide the body's homeostasis, or state of balance among all its systems.

It is a fluid-filled network of tubes (or vessels) through which materials move between the environment and the cells of a multicellular animal. It connects all parts of an organism in a way that allows individual cells to thrive as well as for organisms to function as a unit. It is an entirely closed system.

1/C-Central Idea: -

1- Circulatory system definition.
2- Circulatory system divided.
3- Cardio –vascular system parts.
4- Lymphatic system parts.
5- Heart structure.
6- Blood vessels types.
7- Arteries types and structure.
8- Lymphatic system parts.

1/D-Instructions: -

1- Study over view thoroughly.
2-Determine the performance objectives.
3-Do the pretest and if you have: -
A-Got 9 or more you do not need to proceed.
B-Got less than 9you have to study this modular unit very well.
4-After studying the text of this modular unit, do the posttest, and if you have: -
A-Got 9 or more, go to the second modular unit.
B-Got less than 9, go back and return to study this modular unit; or any part of it; and then return to perform the posttest again.

2/performance objectives :-

After studying this modular unit, the student will be capable to:
1-Define circulatory system.
2- Describe the parts & structure of circulatory system
3-Differentiate between the cardio-vascular system lymphatic system.
4- Divided the lymphatic system parts.
5- Named the heart structure.
6- Divided the arteries types and structure.
7- Mention the blood vessels types.
8- Divided Lymphatic system parts.

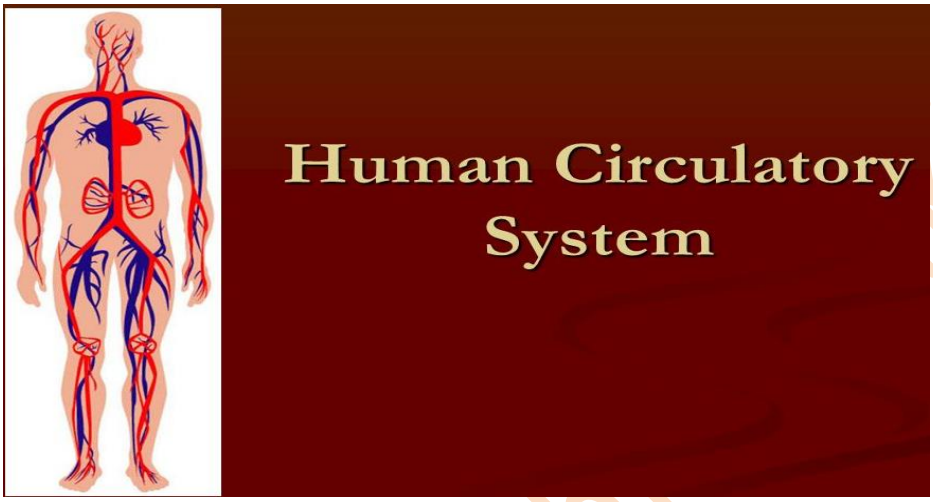
3/pre test :-

Answer with true (T) or false (f) for each of the following statements: -
1- Circulatory System divided in to cardio –vascular system and Lymphatic system.
2- The valves of right half of heart called the mitral valve.
3- Pericardium is the first layer of the heart.
4- Fibrous pericardium: is fibro cartilage layer.
5- Myocardium: is the muscular layer form the wall of heart.
6- Elastic artery muscular artery and arterioles are the types of arteries.
7- Non –fenestrated is the one type of capillaries.
8- Inferior vena cava: collects the blood from other parts of the body.
9- Lymphatic vessels collect extracellular fluid, kill foreign organisms and return it to the circulatory system.
10- Lymph nodes arranged in groups either superficial or other deep.

Note: -
-Check your answers in key answer page at the ending of this modular unit.
- (1) degree for each.

4/ the text:-

Circulatory System



The system in the body by which blood and lymph are circulated . The parts of the circulatory system include the heart, along with all the arteries, veins, and capillaries. The organs of the lymphatic system are also considered to be part of the circulatory system. Nutrients, oxygen, and other vital substances are carried throughout the body by the blood, which is pumped by rhythmic contractions of the heart.

Blood is pumped from the heart to the arteries, which branch into smaller and smaller vessels as they move away from the heart. The blood passes oxygen and nutrients to the cells and picks up waste in the capillaries, then returns to the heart via a system of veins.

The **circulatory system**, also called the **cardiovascular system** or the **vascular system**.

This system divided in to two parts:

1. The cardio –vascular system.
2. Lymphatic system.

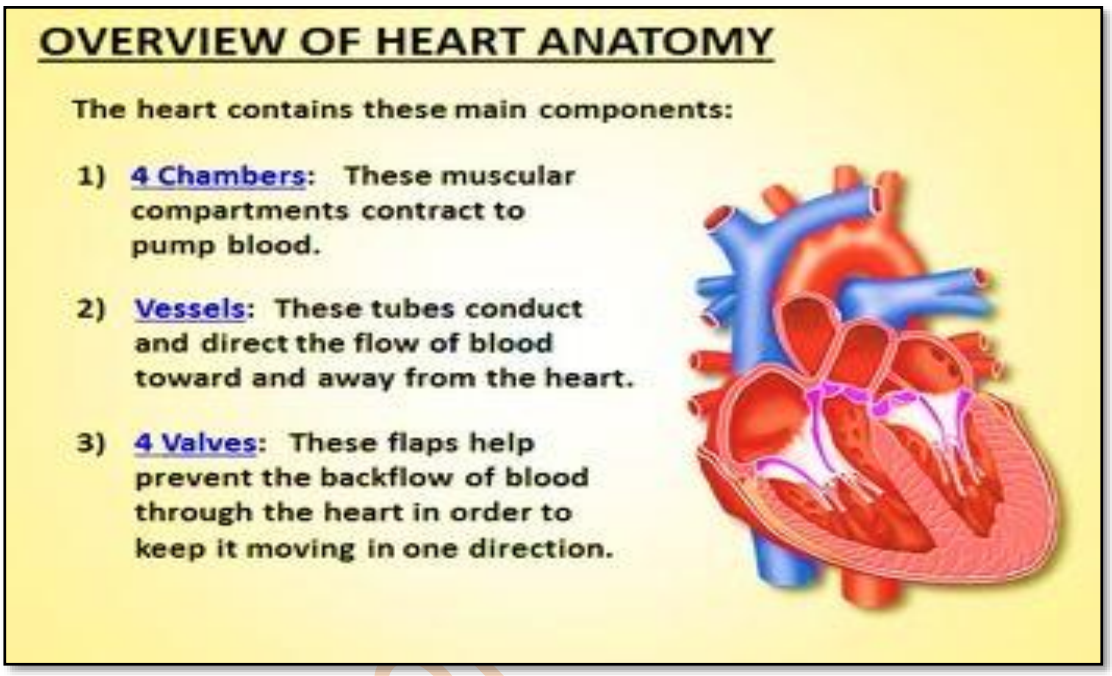
The cardio –vascular system consists of four major components:

-The Heart: The heart rests near the center of the chest. Thanks to consistent pumping, the heart keeps the circulatory system working at all times.

-**Arteries**: carry oxygen-rich blood away from the heart and where it needs to go.

-**Veins**: carry deoxygenated blood to the lungs where they receive oxygen.

-**Blood**: is the transport media of nearly everything within the body. It transports hormones, nutrients, oxygen, antibodies, and other important things needed to keep the body healthy.



Heart:

Is hallow muscular organ lies in the chest behind the sternum between the lungs and above the diaphragm tilted to the left side. The heart has pyramid shape the apex directed upwards and the base downwards. The heart divided into two cavities by muscular septum. Each half has atrium in the upper and ventricles in the lower, separated from other by valves. The valves of right called the tricuspid valves while of the left side called the mitral valve.

-Structure of the heart: it consists of three layers:

1. Pericardium
2. Myocardium
3. Endocardium.

1. Pericardium: it is envelope that surrounded the heart and protects from the sudden dilatation, and consist of:

a. Fibrous pericardium: is fibrous layer.

b. serous pericardium: is membrane of two layer:

1. Parietal layer: is outer layer lined the fibrous pericardium.
2. Visceral layer: is inner layer envelope the heart.

- Between these two-layer space filled with serum fluid act as lubricant.

2. Myocardium: is the muscular layer from the wall of heart has special muscle called cardiac muscle.

3. Endocardium: is the inner layer (squamous epithelium) that lined the cavity of the heart and the cusps of the valves.

-Blood supply of the heart is from the coronary artery arising from the aorta, they are two one right and other left.

Quiz / 1
Enumerate parts of circulatory System.

Quiz / 2
Explain structure of the heart.

Quiz / 3
Mention the Blood supply of the heart.

Note: -
-Check your answers in key answer page at the ending of this modular unit.

Blood vessels:

There are three types of the blood vessels:

1. Arteries.
2. Capillaries.
3. Veins.

1.Arteries: -

The arteries are the blood vessels with thick wall that carry the blood from the heart to the capillaries in the different part of the body, and consist of three layers:

a. Tunica adventitia: is the outer layer composed of fibrous tissue.
b. Tunica media: is middle layer which is muscular layer consisting of the smooth muscles.
c. Tunica intimae: is the inner layer that lined the arteries.

Types of the arteries: the arteries divided according to their diameter and function into:

1. Elastic arteries: Is wide diameters elastic wall. Example: aorta.
2. Muscular arteries: are intermediate diameters, muscular wall rich with muscular tissue (smooth muscle)
3. Arterioles: are small diameter end in the capillary.

2.Capillaries: are net of the blood vessels that disturbed in different tissue that carry the blood from the arteries pass through it then transmit to the venules. There are two types of capillaries:

1. Fenestrated capillaries.
2. Non –fenestrated capillaries.

3. Veins: they are starts at the end of capillaries first type venules that attached to each other to form the veins and collect with each other till end into two main veins: superior vena cava and inferior vena cava.

Superior vena cava: collects the blood from head, neck, and upper limb; while
Inferior vena cava: collects the blood from other parts of the body.

Aorta: is the largest artery in the body start from the left ventricle and then curve in thoracic cavity called Thoracic aorta then inter the abdomen called abdominal aorta, then end by divided into two arteries right iliac artery and left iliac artery.

1. Thoracic aorta.
   a. Ascending aorta.
   b. Aortic arch.
   c. Descending aorta.
2. Abdominal aorta.
   a. Coeliac artery.
   b. Superior mesenteric artery.
   c. Inferior mesenteric artery.
   d. Right renal artery.
   e. Left renal artery.

The lymphatic system

The lymphatic system is an open transport system that works in conjunction with the circulatory system.

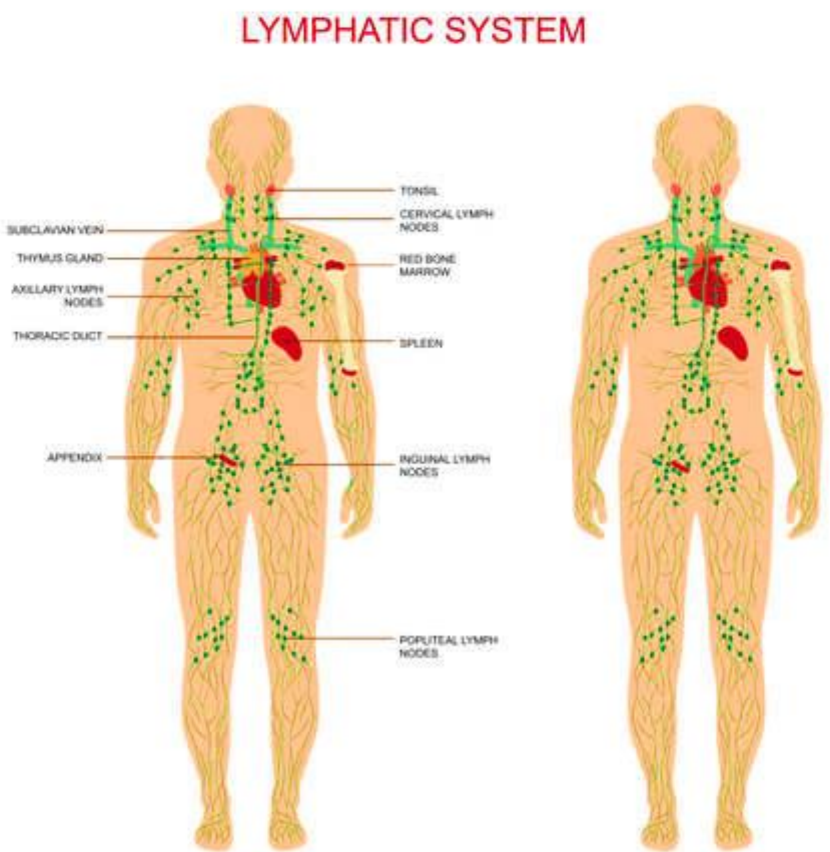
Lymphatic vessels collect intercellular fluid (tissue fluid), kill foreign organisms, and return it to the circulatory system.

The lymphatic system also prevents tissue fluid from accumulating in the tissue spaces.

Lymph capillaries pick up the intercellular fluid, now called lymph, and carry it into larger and larger lymph vessels. Inside the lymph vessels, lymph passes through lymph nodes, where lymphocytes attack viruses and bacteria. The lymphatic system transports lymph to the large brachiocephalic veins below the collarbone where it is re-enters the circulatory system.

Lymph moves through the lymphatic system by the squeezing action of nearby muscles, for there is no pump in this system. Lymph vessels are equipped with one-way valves that prevent backflow.

The spleen, an organ of the lymphatic system, removes old blood cells, bacteria, and foreign particles from the blood.

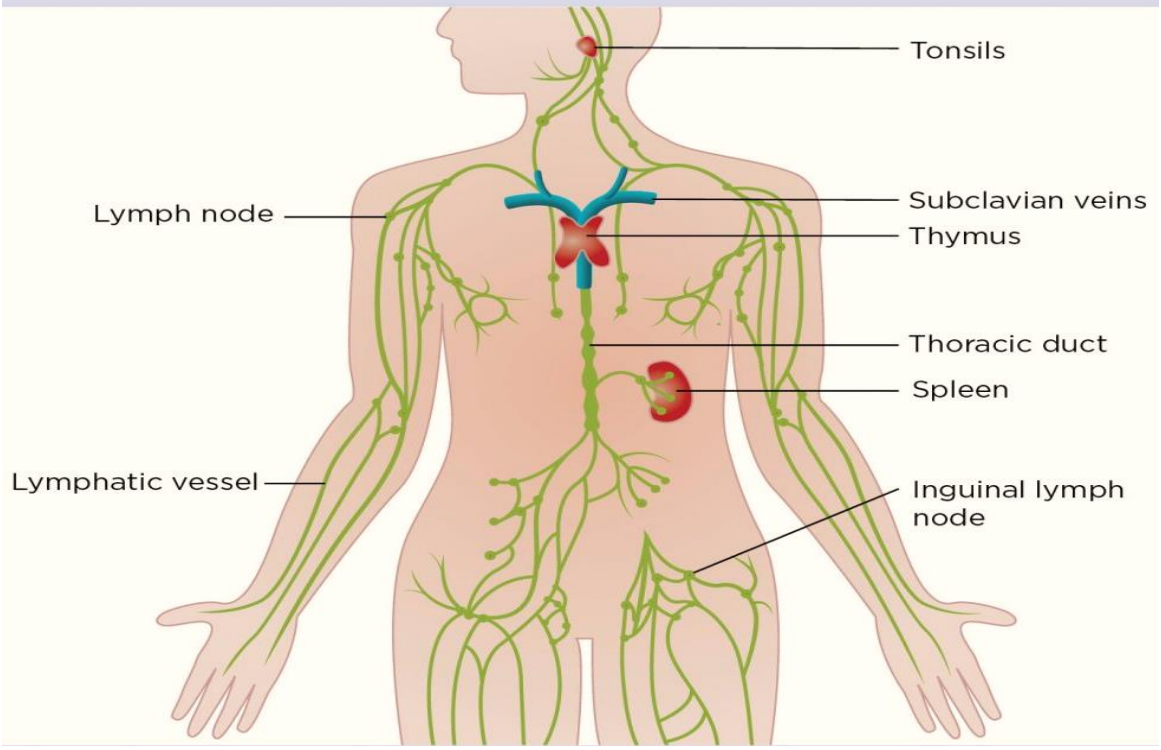


Lymphatic system: -
It consists of
1- Lymphatic vessels.
2- Lymphoid tissues.
3-Lymphoid organ: -
A- Lymph nodes.
b- Spleen
c- Tonsils.
d- Thymus.

Lymph nodes: -
Is spherical shape arranged in groups either superficial or other deep.
1-Superficial lymph nodes: -
A- Cervical group.
b- Auxiliary group.
c- Inguinal group.

2-Deep lymph nodes: -
1- Iliac group.
2- Lumber group.
3- Thoracic group.
4- Mesenteric group.
4- Portal group.

Fig 1. **The major components of the lymphatic system**



Quiz / 4
Define: 1. Tunica intimae. 2. Muscular arteries. 3. Aorta.

Quiz / 5
Define and mention the groups of lymph nodes.

Note: -
-Check your answers in key answer page at the ending of this modular unit.

5/post test

Complete the following statements with correct words: -
1- The heart divided into two cavities by ……. Each half has ……. in the upper and ……. in the lower.
2- Three types of the blood vessels: 1- ……. 2- ……. 3- …….
3-Parts of the thoracic aorta: 1- ……. 2- ……. 3- …….
4-One example of deep lymph nodes …….

Note: -
-Check your answers in key answer page at the ending of this modular unit.
- (1) degree for each blank.

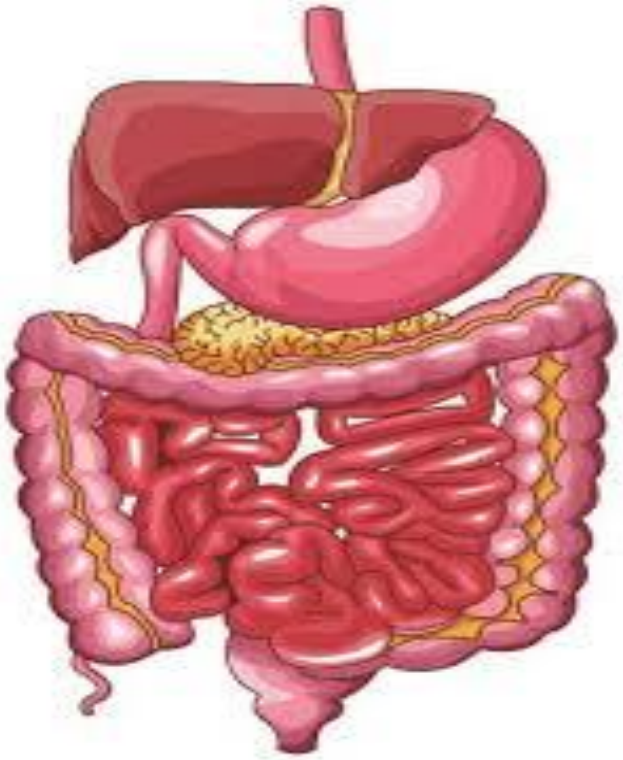
6/ Key answer

Pre test		Post test
1. T.	Quiz / 1see page no. 82.	1. muscular septum , atrium, ventricles
2.F.	Quiz / 2 see page no.82 .	2. Arteries, Capillaries, Veins.
3. T.	Quiz /3see page no.83,84	3. Ascending aorta, Aortic arch, Descending aorta.
4. F.	Quiz / 4 see page no. 85.	4. Portal group.
5.T.		
6.T.		
7.T.		
8. T.		
9. F.		
10.F.		

If you: -
***Got 9 or more you do not need to proceed.**
***Got less than 9you have to study this modular unit verv well.**

The eighth modular unit

Digestive system



1 / over view

1/A-Target population: -

This unit Learning package had been designed to the first class students in the community health Dept. KARBALA institute Technology.

1/B-Rationale: -

Gastrointestinal (GI) tract [Alimentary canal] a continuous muscular digestive tube. Gastrointestinal functions are: (Digests, Absorbs and Eliminates) they are means: Digests: breaks food into smaller fragments. Absorbs: digested material is moved through mucosa into the blood. Eliminates: unabsorbed & secreted wastes.

1/C-Central Idea: -

1- Gastrointestinal tract definition.
2- Gastrointestinal tract parts.
3- Accessory structure included.
4- Mouth cavity parts.
5- Tongue and taste bud types.
6- Teeth types.
7- Pharynx and all other parts of (GI) explain.
8- Accessory of the large intestine included.

1/D-Instructions: -

1-Study over view thoroughly.
2-Determine the performance objectives.
3-Do the pre test and if you have: -
A-Got 9 or more you do not need to proceed.
B-Got less than 9you have to study this modular unit very well.
4-After studying the text of this modular unit, do the post test, and if you have: -
A-Got 9 or more, go to the second modular unit.
B-Got less than 9, go back and return to study this modular unit; or any part of it; and then return to perform the post test again.

2/performance objectives :-

After studying this modular unit, the student will be capable to:
1-Define the gastrointestinal tract.
2-Know the gastrointestinal tract parts.
3-Mention the accessory structure included.
4- Mention mouth cavity parts.
5-Named types of tongue taste bud.
6- Divided the teeth types.
7-Divided the human body into lines.
8-Explain pharynx and all other parts of (GI).
8- Mention accessory of the large intestine.

3/pre test :-

Answer with true (T) or false (f) for each of the following statements :-
1- The gastrointestinal tract include (mouth cavity, pharynx, esophagus and Large intestine).
2- Accessory of intestine are: liver, gallbladder and pancreas.
3- Mouth cavity proper: it from the largest part of the mouth.
4- Uvula: conical shape from the posterior part of soft palate.
5- Foliate papillae: rough surface.
6- Canines: they are 4 for each jaw 2in the right and 1in the left.
7-Naso –pharynx: lies posterior to the oral cavity.
8- The stomach has two opening cardiac and funds sphincter.
9-Ileum: is the third part of the small intestine.
10- Diaphragmatic surface of liver contact with viscera downward.

Note: -
-Check your answers in key answer page at the ending of this modular unit.
- (1) degree for each.

4/ the text:-

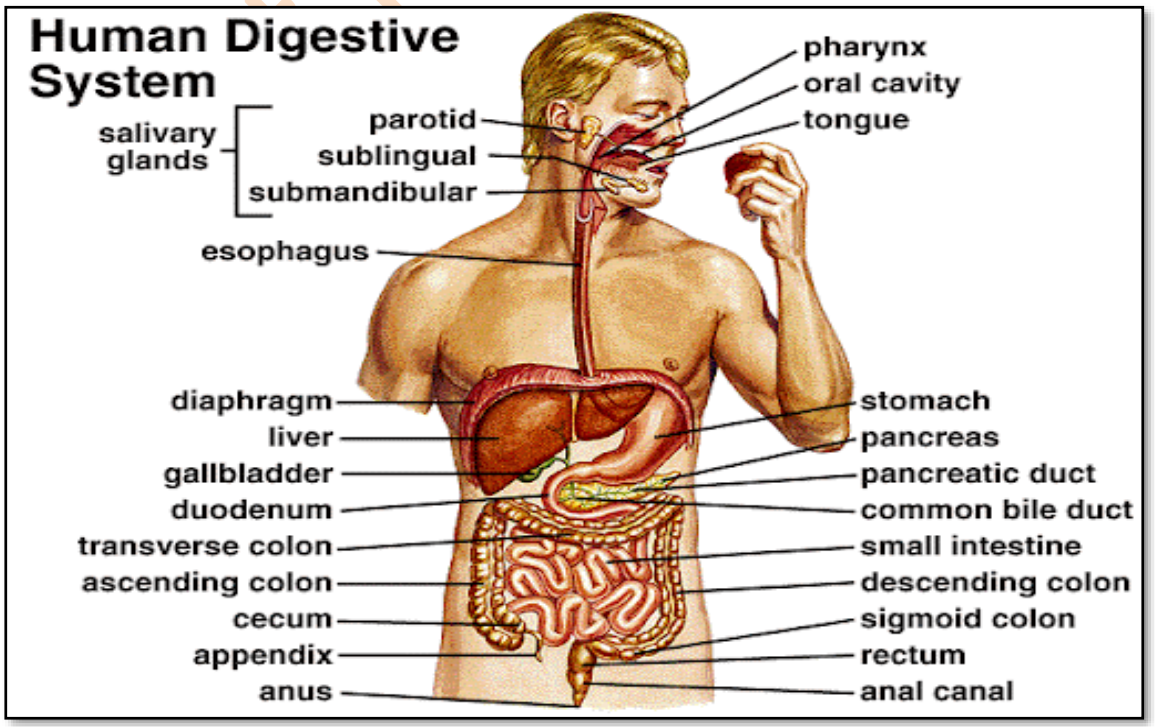
Digestive system

It called alimentary canal which is long irregular canal with accessory parts.

A. The gastrointestinal tract includes:
1. Mouth cavity.
2. Pharynx
3. Esophagus
4. Stomach.
5. Small intestine
6. Large intestine.

B. Accessory structure includes:
1. <u>Accessory of mouth</u>:
1. Salivary glands.
2. Tongue.
3. Teeth.

2. <u>Accessory of intestine:</u>
1. Liver
2. Gall bladder.
3. Pancreas.



1. Mouth cavity: consist of two parts:

a. Mouth cavity proper: it forms the largest part of the mouth which contain the tongue inside and surrounded by gum and teeth.

b. Vestibule: is the outer part of mouth between the gum and teeth internally and the cheeks and lips externally.

Lips: they are two folds composed of the skin externally, mucous membrane internally and the orbicularis oris muscle between them.

- The roof of the mouth composed of the following parts:

1. **Hard palate**: anterior.
2. **Soft palate:** posterior.
3. **Uvula:** conical shape forms the posterior part of soft palate

- The floor of the mouth occupied by the tongue.

-Accessory of mouth:

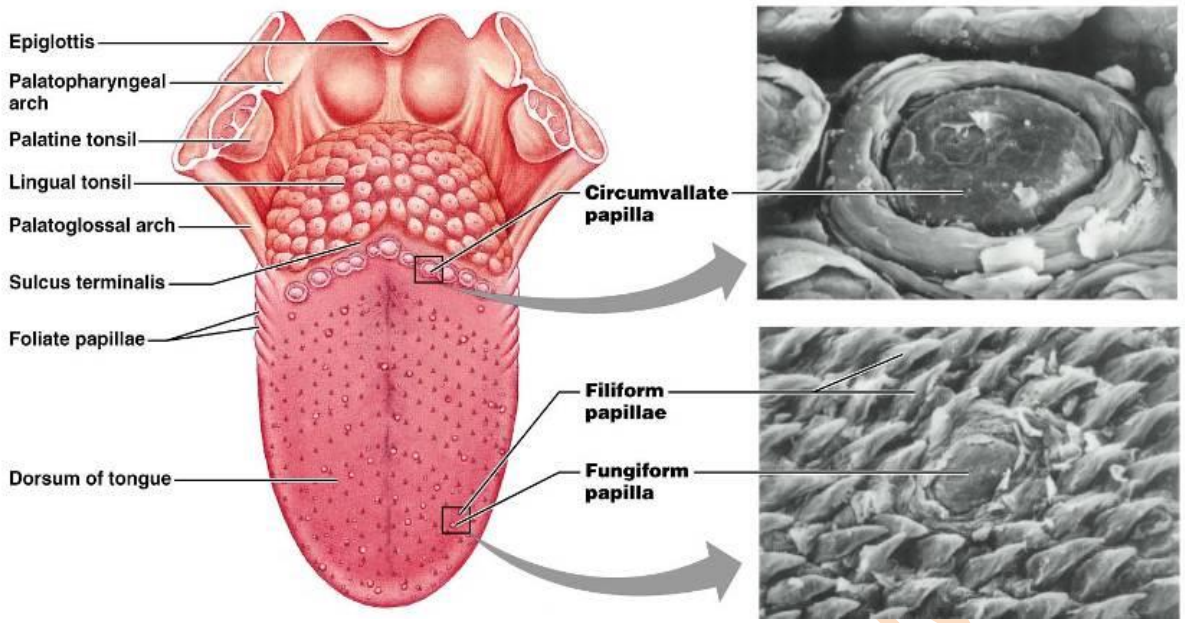
Tongue: is the muscular organ composed of the voluntary muscles covered with mucous membrane. The upper surface and sides of the tongue are rough because it covered with papillae (taste bud).

A. Circumvallate papillae: these papillae arranged in v- shaped in the posterior of the tongue.

B. Fungi form papillae: (like mushroom): are present at apex and along sides of the tongue.

C. Filiform papillae: distributed along sides of the tongue.

D. Foliate papillae: two sides of tongue



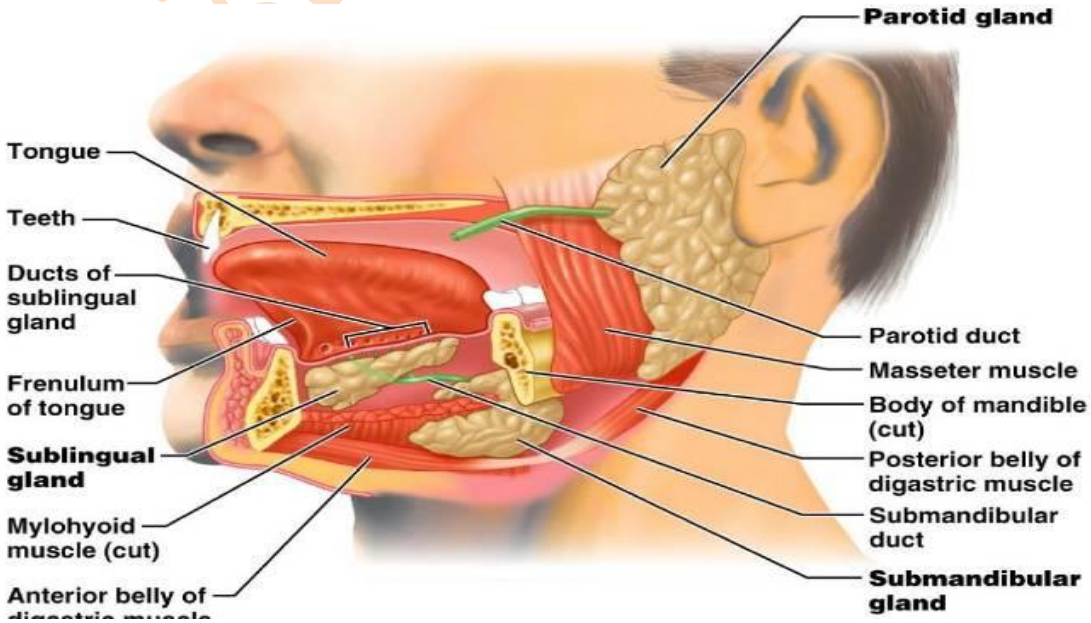
Salivary glands: is the accessory organ secret the saliva.

There are three pairs of salivary glands:

a. Parotid gland: it located under and in front of the ears two one right and other left and have duct that secretes saliva into –oral; cavity and vestibule at upper second molar.

b. Submandibular gland: it found beneath the lower jaw in the anterior part of the floor of the mouth. they are two one right and other left.

c. Sublingual gland: it found beneath the tongue near midline.



Quiz / 1
Define gastrointestinal tract and enumerate parts of it included.

Quiz / 2
Explain Salivary glands.

Note: -
-Check your answers in key answer page at the ending of this modular unit.

Teeth: they are bony structure of the digestive system located in the sockets of the alveolar process of the mandible and maxilla, there are two main groups:

a. Primary teeth: there are 20 teeth in number appear from the 6 months

b. Secondary teeth: there are 32 teeth in number appear from 6 years.

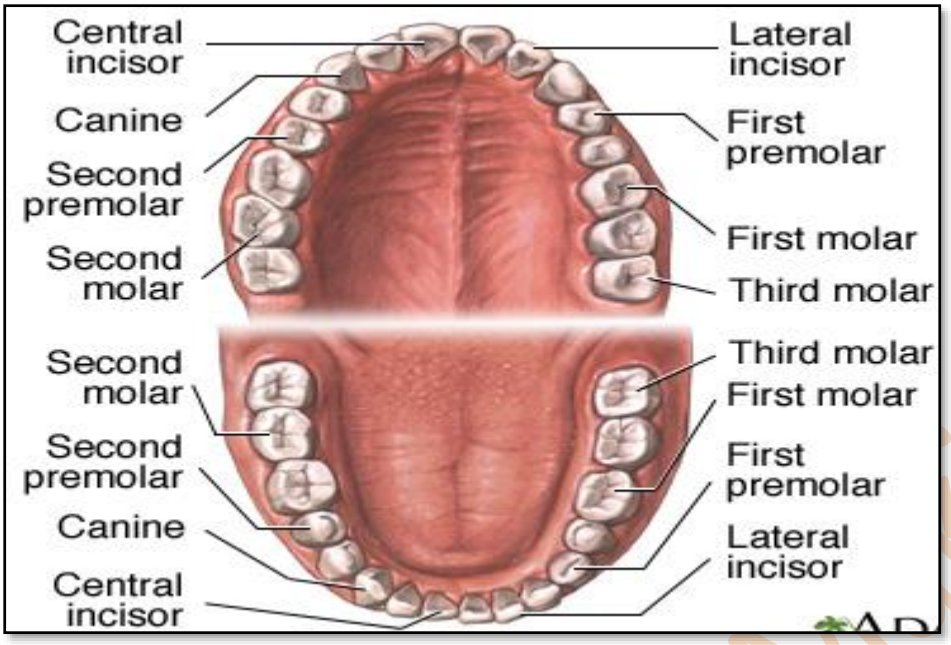
There are:

1. Incisors: they are 4 for each jaw 2in the right and 2 in the left.

2. Canines: they are 2 for each jaw 1in the right and 1in the left.

3. Premolars: they are 4 for each jaw 2in the right and 2in the left

4. Molars: they are. 6 for each jaw 3 in the right and 3 in the left.



2- Pharynx: is muscular tube that consists of three parts:

a. Naso – pharynx: lies posterior to the nasal cavity.
b. Oro- pharynx: lies posterior to the oral cavity.
c. Laryngo - pharynx: lies posterior to the larynx.

3- Esophagus: it is the tubular muscular structure its length about 25cm anterior to the vertebral column, pass through diaphragm and terminates at the cardiac portion of the stomach.

4- Stomach: it is the enlargement part of the GIT directly under the diaphragm in the epigastric, umbilical and left, hypochondrial regions of the abdomen.

The superior portion of the stomach end with esophagus, while the inferior portion connects with duodenum.

- The stomach divided into 3 parts:

a. Funds.
b. Body.
c. Pylorus.

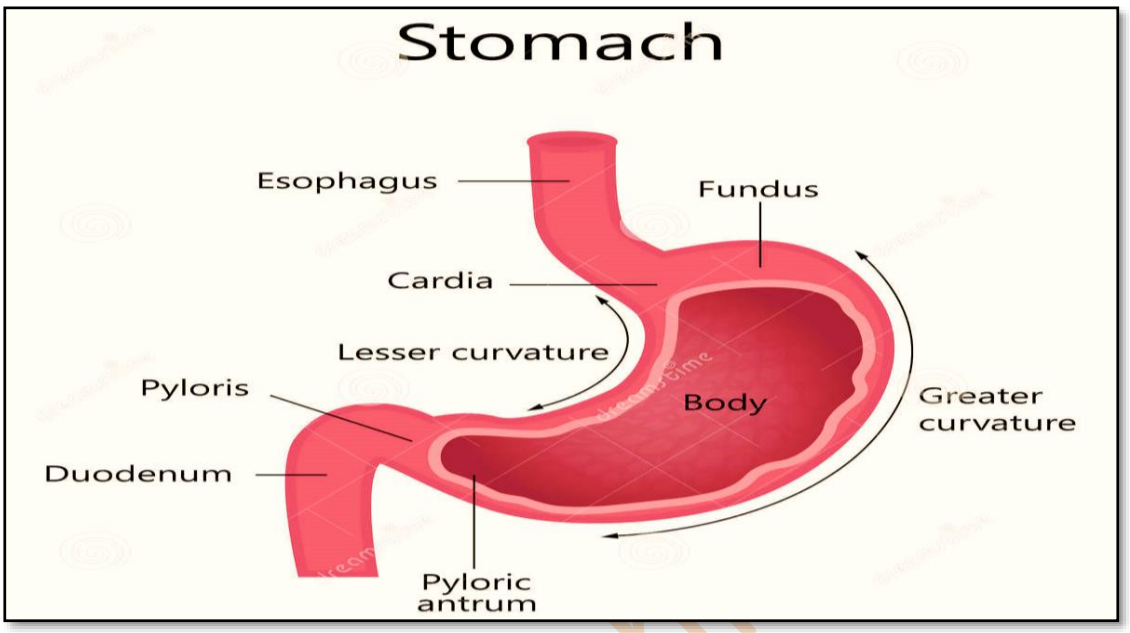
- The stomach has two borders:

a. Lesser curvature.
b. Greater curvature.

-Gastric sphincters: the stomach has two opening:

a. Cardiac sphincter.

b. pyloric sphincter.



5- <u>Small intestine: it composed of 3 parts</u>:

a. Duodenum.

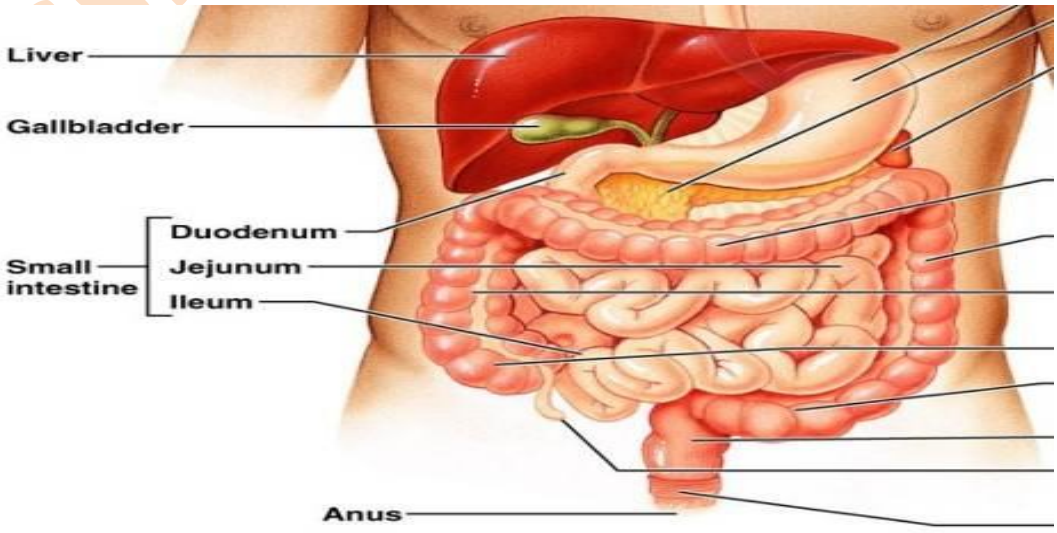
b. Jejunum.

c. Ileum.

a. **Duodenum**: Is the first part of the small intestine about 30 cm in length. It is in the form of c-shaped loop.

b. **Jejunum:** Is the second part of the small intestine in which the duodenum ends continues with it

c. **Ileum**: is the third part of the small intestine its terminal part joining with caecum in the right side.



6- Large intestine: it composed of:
a. Caecum.
b. Vermiform appendix.
c. Ascending colon.
d. Transverse colon.
e. Descending colon.
f. Sigmoid colon.
g. Rectum.
h. Anal canal (anus).

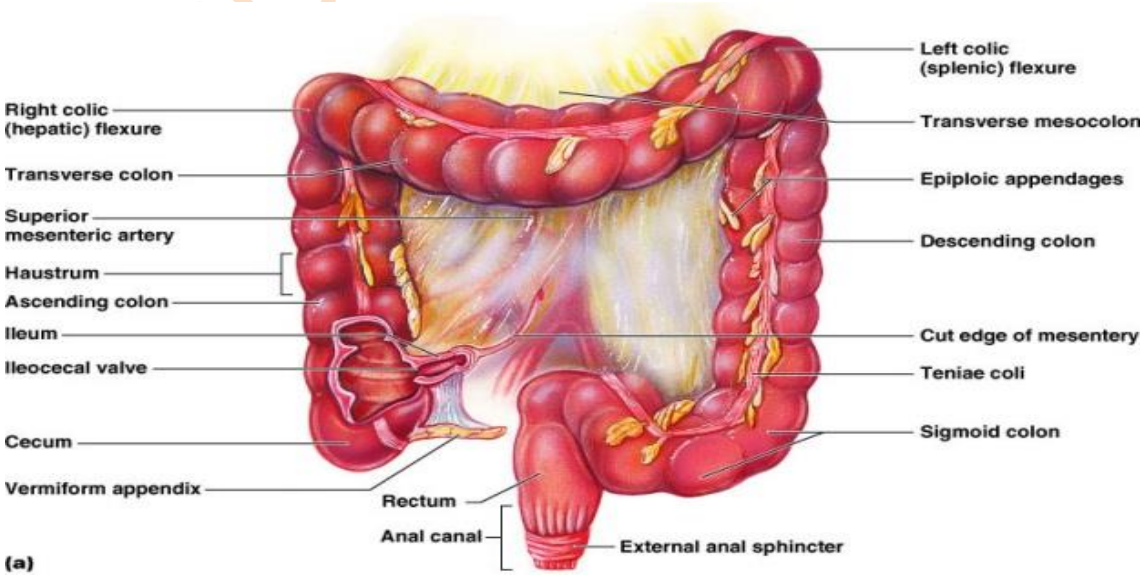
Caecum: is the part of the large intestine lying below the level of the ileocaecal junction is called caecum it is called so because its lower end is blind .it is about 6cm in height.

Vermiform appendix: It is tube about 9cm in length and look like round worm the apex is blind and the base is open.

The ascending colon is running upwards along the right side in the abdominal cavity, the ascending colon continuous with transverse colon which is running from right to the left which becoming continuous with descending colon. The descending colon is running downwards along the left side below it become continuous with sigmoid colon.

Rectum: is wide tube about 13 cm long. It lies in pelvis near the midline, the upper end is continuous with the sigmoid colon, while the end connects with anal canal.

Anal canal: is the lower part of the alimentary canal, above it is continuous with the rectum and below it opening to the external at anus, it is about 3cm long and narrower than rectum.

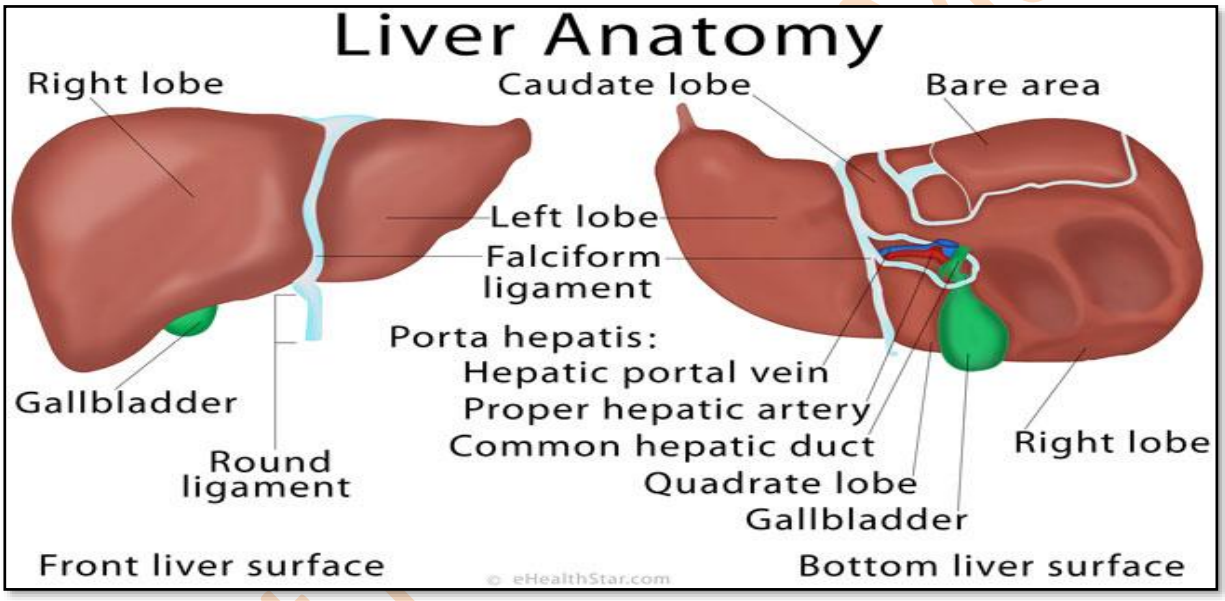


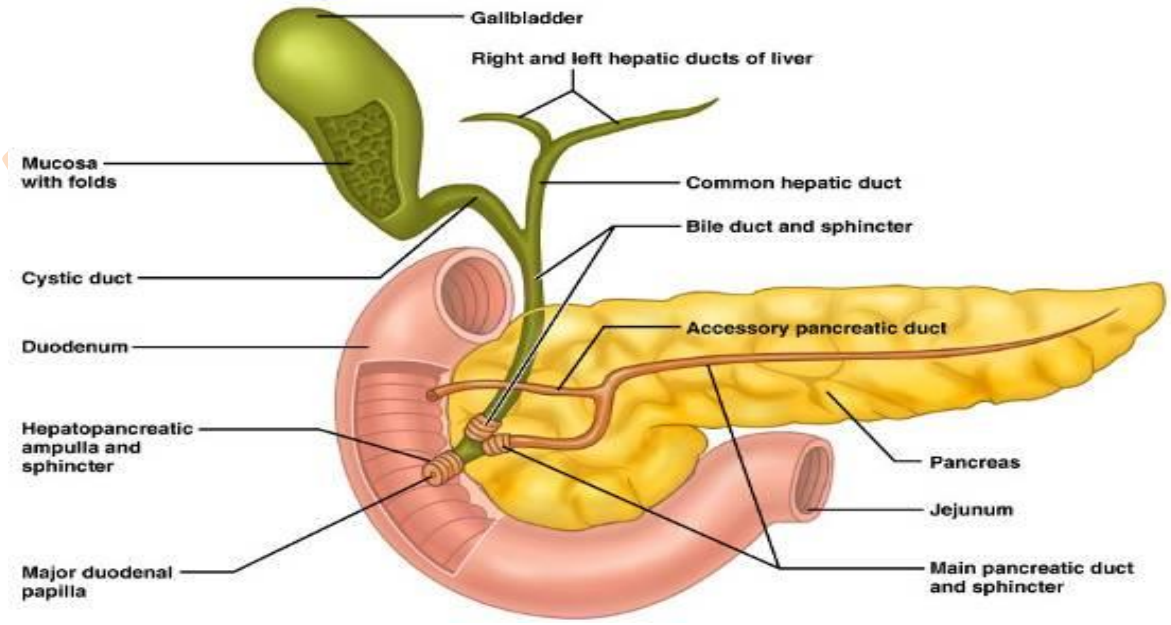
Accessory of the large intestine:

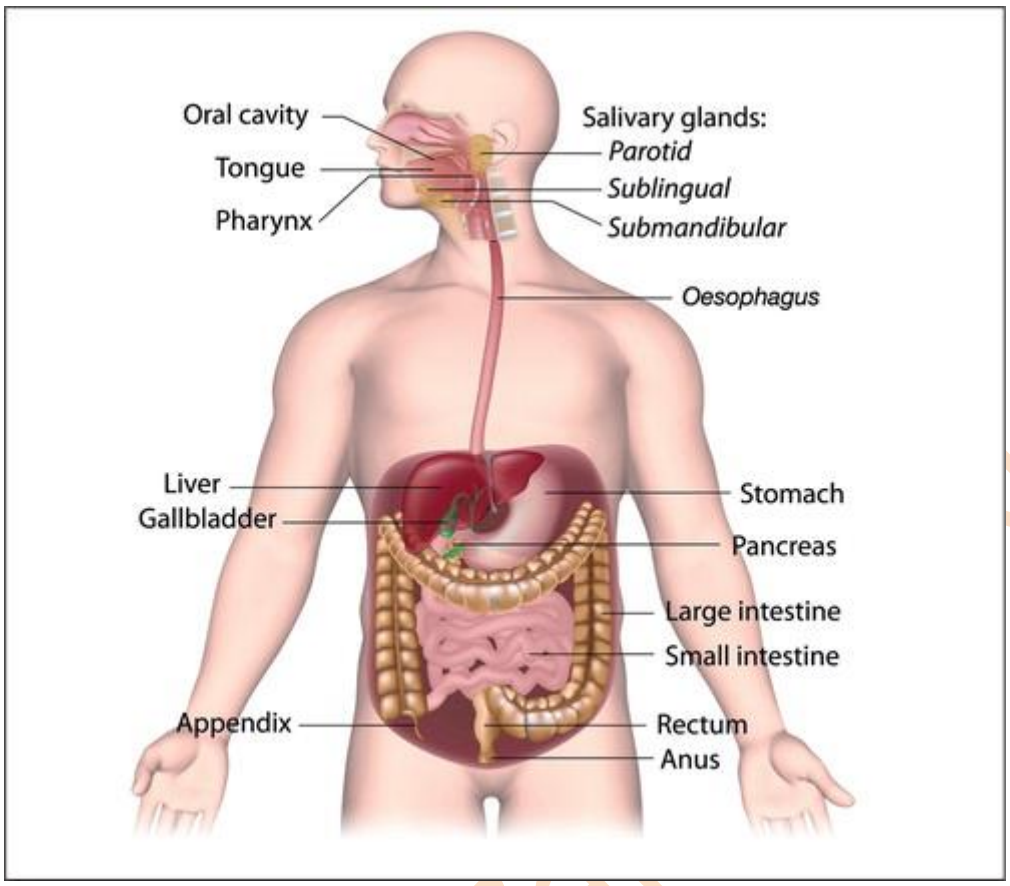
1. Liver: it is divided into right and left lobes and has two surface diaphragmatic surfaces which contact with diaphragm and visceral surfaces downward contact with viscera.

2. Gall bladder: is small sac attached to the visceral surface of the right lobe of liver. It consists of funds (lower part), body (central part), neck upper part which is narrow and connected with cystic duct that drain into bile duct.

3. Pancreas: is the large gland close to the duodenum part in right and other in left the right end is enlarged called head then body then the left end which is thin called tail.







Quiz / 3

Enumerate parts of Small intestine and explain one.

Quiz / 4

Complete the following statements with correct words:-

1-…… is tube about 9cm in length and look like round worm the apex is blind and the base is open in the …… .

2- …… it is divided into right and left lobes and has two surface diaphragmatic surfaces which contact with viscera downward.

Note: -

-Check your answers in key answer page at the ending of this modular unit.

5/post test

Answer with true (T) or false (f) for each of the following statements: -

1- Lips: they are two folds composed of the skin externally and the mucous membrane internally and the orbicularisoris muscle between them.
2- The upper surface and sides of the tongue are rough because it covered with papillae (taste bud).
3- Sublingual gland: it found beneath the tongue near midline.
4- Esophagus pass through diaphragm and terminates at the cardiac portion of the stomach.
5- The stomach has two borders lesser curvature and greater curvature.
6- Caecum: is the part of the large intestine lying below the level of the ileocaecal junction, it is about 6cm in height.
7- Rectum: is wide tube about 13 cm long lies in pelvis near the midline.
8- Anal canal: is the lower part of the alimentary canal.
9- Neck of gallbladder is a lower part which is narrow and connected with cystic duct that drains into bile duct.
10- The right end of pancreas thin called tail of pancreas.

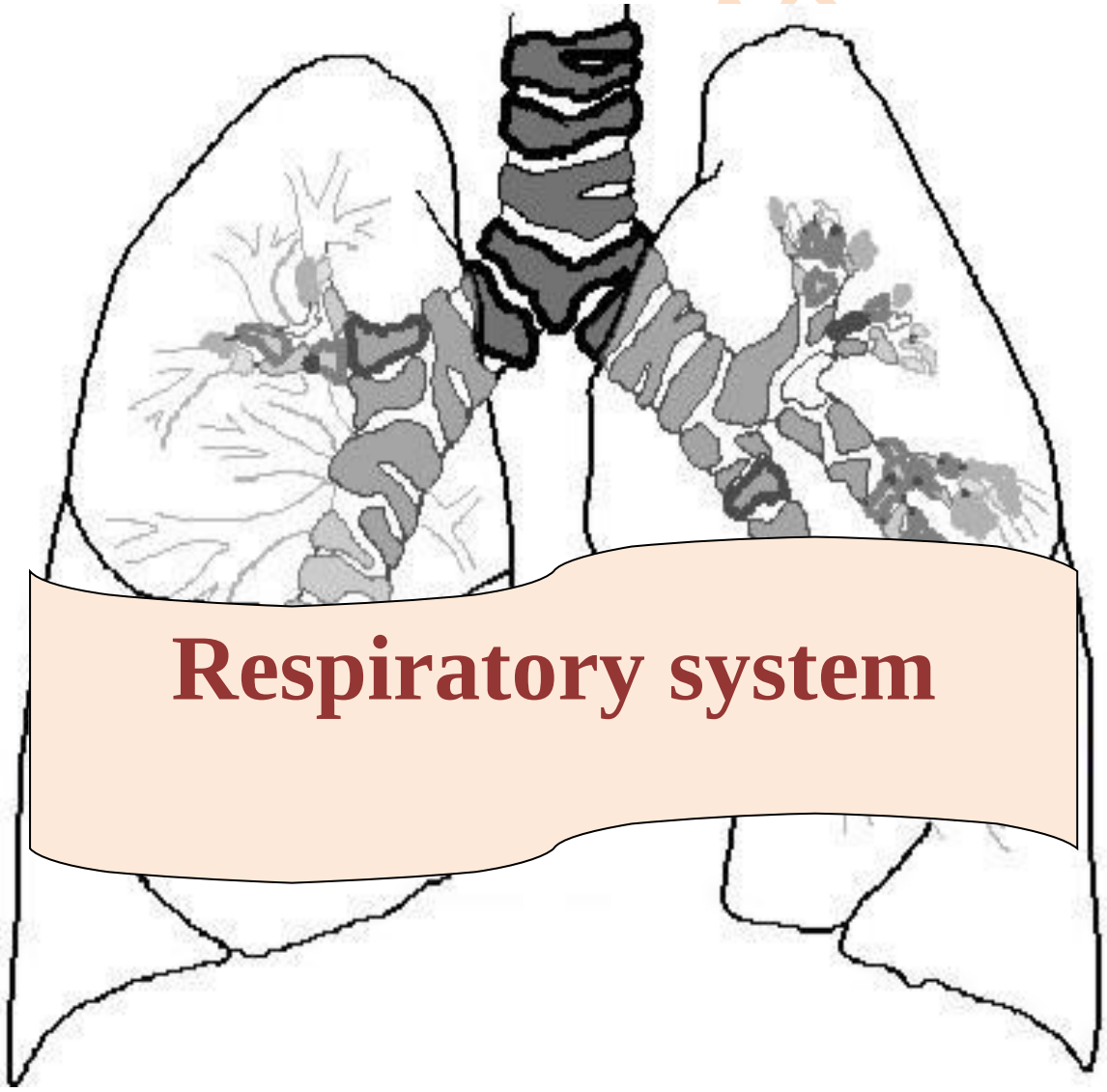
Note: -
-Check your answers in key answer page at the ending of this modular unit.
- (1) degree for each.

6/ Key answer

Pre test		Post test
1. F.	Quiz / 1 see page no. 90.	1. T.
2.T.	Quiz / 2 see page no. 92.	2.T.
3. T.	Quiz / 3 see page no. 94.	3. T.
4. T.	Quiz / 4 /1-Vermiform appendix, caecum. 2-liver,	4. T.
5.F.		5.T.
6.F.		6-T.
7.F.		7-T.
8. F.		8-T.
9. d.		9-F.
10.d.		10-F.

If you: -
***Got 9 or more you do not need to proceed.**
***Got less than 9you have to study this modular unit very well.**

The ninth modular unit



Respiratory system

1 / over view

1/A-Target population: -

This unit Learning package had been designed to the first class students in the community health Dept. KARBALA institute Technology.

1/B-Rationale: -

Respiratory system is an important system in the body for gas exchange between air in lungs and blood.

Respiration is the process by which the body takes in and utilizes oxygen (O_2) and gets rid of carbon dioxide (CO_2) and voice production: movement of air past vocal folds makes sound and speech.

1/C-Central Idea: -

1- Respiratory system structure.
2- Upper airway (respiratory passages) parts.
3- Lower airway (respiratory passages) parts.
4-Upper respiratory passage defines.
5- Lower respiratory passage defines.
6- Named the cartilages of larynx.

1/D-Instructions: -

1- Study over view thoroughly.
2-Determine the performance objectives.
3-Do the pre test and if you have: -
A-Got 9 or more you do not need to proceed.
B-Got less than 9you have to study this modular unit very well.
4-After studying the text of this modular unit, do the post test, and if you have: -
A-Got 9 or more, go to the second modular unit.
B-Got less than 9, go back and return to study this modular unit; or any part of it; and then return to perform the post test again.

2/performance objectives :-

After studying this modular unit, the student will be capable to:
1-Know parts of the respiratory passages.
2- Mention the upper respiratory passages.
3- Mention the lower respiratory passages.
4- Define each part of the upper respiratory passage.
5-Define each part of the lower respiratory passage.
6- Named the cartilages of larynx.
7- Define the vocal cords.
8- Define the hyoid bone.

3/pre test :-

Answer with true (T) or false (f) for each of the following statements:-

1- One part of the respiratory passage is larynx.
2- The nasal cavity has roof, floor, posterior wall, inferior wall.
3- The floor consists of bony palate palatine process of maxilla and palatine bone.
4- The opening of nasal cavity called sinus.
5- The lateral wall consists of the nasal septum.
6- Cricoids' cartilages look like ring located below the thyroid cartilage.
7- The bone structure in U-shaped lie below the tongue between the lower jaw and larynx called hyoid bone.
8- The upper end of trachea continuous with the larynx while the lower end divided into two parts bronchus**.**
9- Costal surface of lung laterally.
10-The left lung divided into two lobes by the oblique fissure.

<u>Note</u>: -
-Check your answers in key answer page at the ending of this modular unit.
- (1) degree for each.

4/ the text:-

ANATOMY OF THE RESPIRATORY TRACT

Respiratory system: It is an important system in the body.

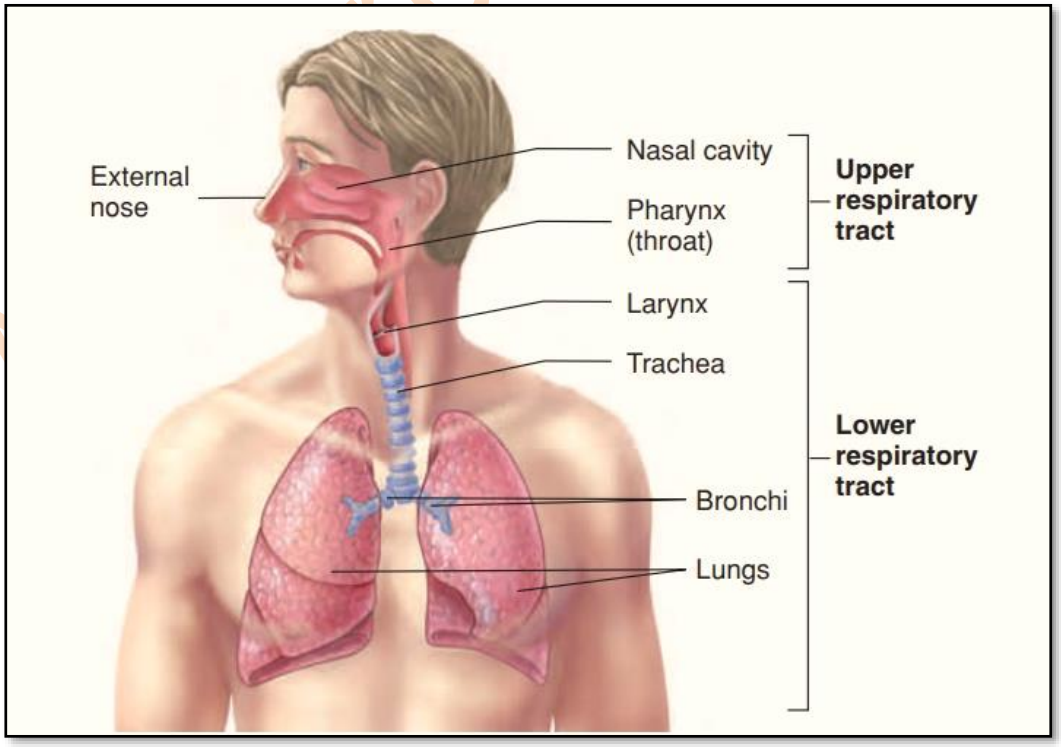
It consists of or Respiratory System divisions in to: -

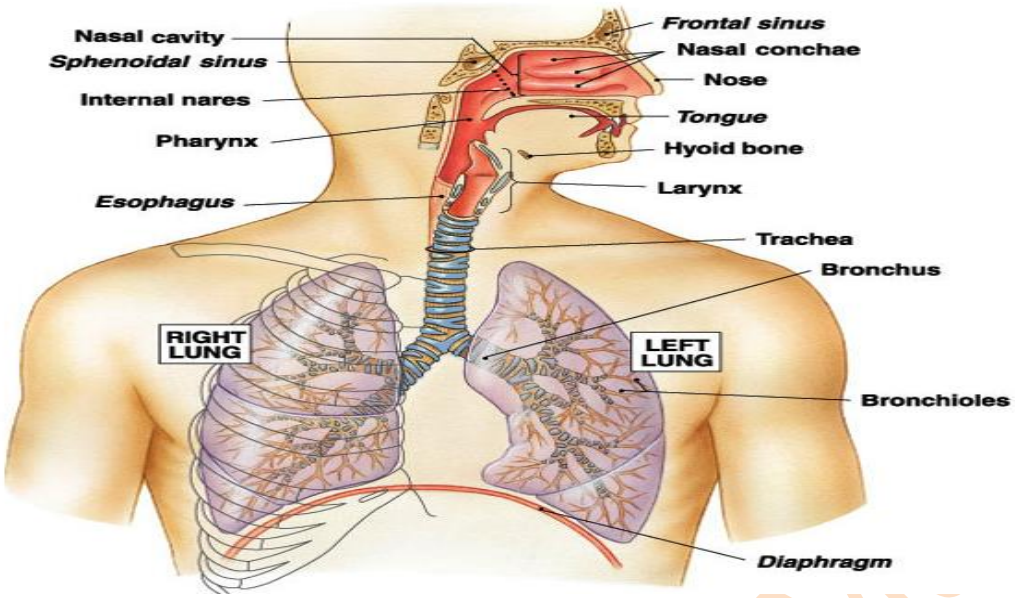
A. Upper airway respiratory passages: include

1. Nasal cavities.
2. Pharynx.
3. Larynx.

B. Lower airway or respiratory passages: -

1. Trachea.
2. Bronchial tree.
3. Lungs.





A-Upper respiratory passages: include

1. **Nasal cavities**: they consist of two cavities (right and left) separated by septum called nasal septum. Each cavity has two opening: anterior nares and posterior nares, the anterior nares open to the outside where the air enters while the posterior nares open to the naso- pharynx. the nasal cavity has roof, floor, lateral wall, medial wall:

   The roof consists of:

   1. Nasal bone.
   2. Frontal bone.
   3. Cribriform plate of Ethmoid bone.
   4. Sphenoid bone.

   The floor consists of bony palate (palatine process of maxilla and palatine bone).

The lateral wall consists of the nasal process of maxilla also there are **three bony prominences called nasal conchae:**

1. Superior nasal conchae.
2. Middle nasal conchae.
3. Inferior nasal conchae.

-Also there is opening of the sinus into nasal cavity are:

1. Maxillary sinus.
2. Frontal sinus.
3. Sphenoidal sinus.
4. Ethmoidal sinus.

The medial wall consists of the nasal septum.

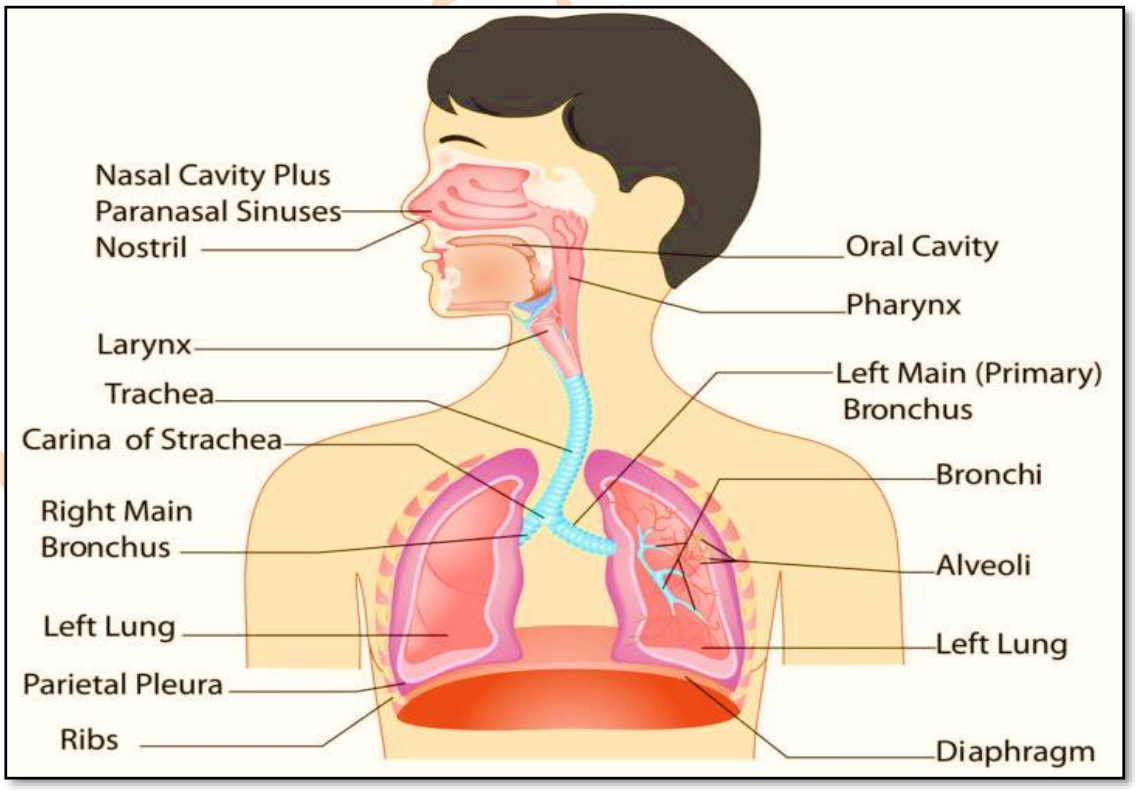
Quiz / 1
Enumerate parts of respiratory passages.

Quiz / 2
Explain Nasal cavities.

Note: -
-Check your answers in key answer page at the ending of this modular unit.

2. Pharynx: it has three parts (naso – Pharynx, oro –pharynx, laryngo – pharynx). The naso –pharynx located posterior to the nasal cavity extend from the base of skull to the level of the soft palate.

3.Larynx: is the respiratory structure responsible for sound production by presence of the vocal cords. It lies in front of the laryngo –pharynx extends from the root of the tongue to the level of trachea. It forms from the 9 cartilages (3 single and 3 pairs).



The 3 single cartilages are:

1. Thyroid cartilage: is the largest one located in the superior part of the neck in midline.

2. Cricoid cartilage: look like ring located below the thyroid cartilage.

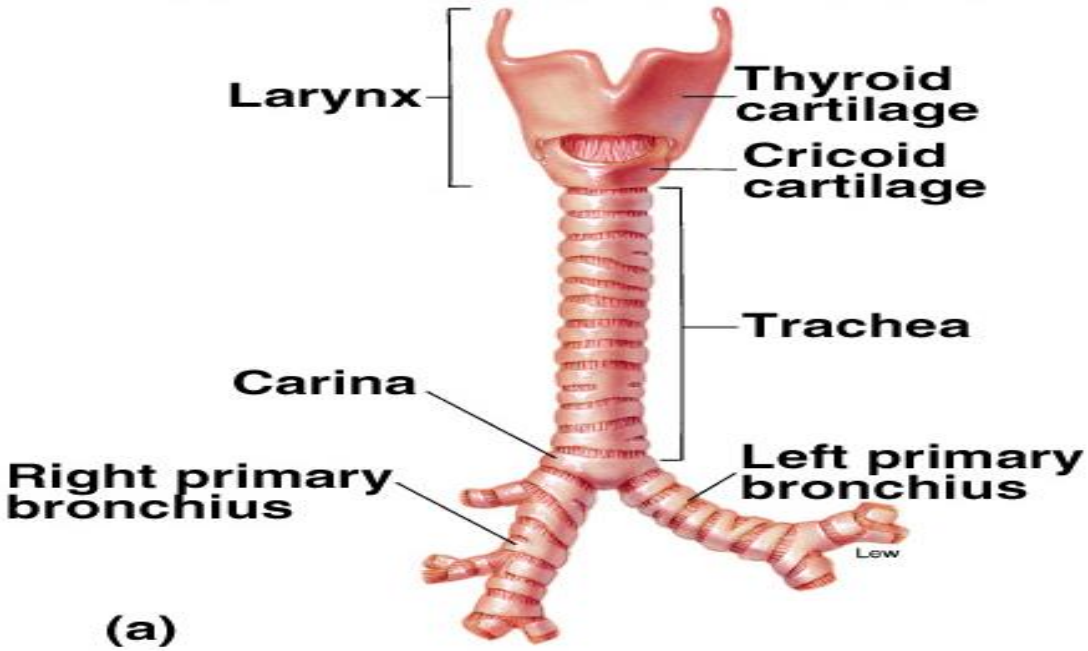
3. Epiglottic cartilage: look like tongue located posteriorly in midline.

The 3 pair's cartilages are:

1. Arytenoid cartilages: they are pyramidal in shape in the posterior part of cricoid cartilage.

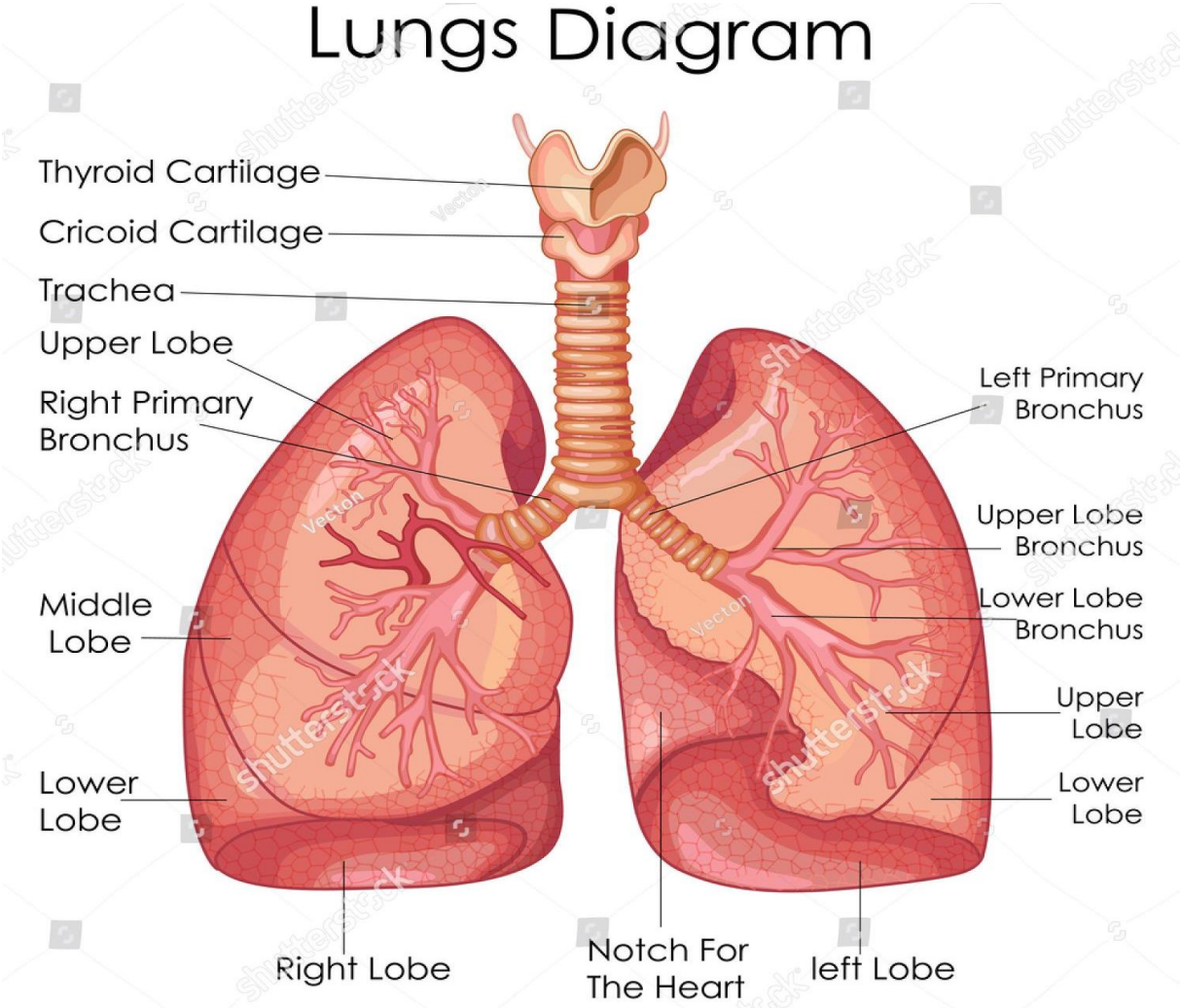
2. Corniculate cartilages: are attached to the upper part of arytenoids cartilages.

3. Cuneiform cartilages.



Vocal cords: they are two one right and other left attached the arytenoid cartilages posteriorly and the posterior surface of the thyroid cartilage anteriorly.

Hyoid bone: is U-shaped bone lies below the tongue between the lower jaw and larynx.



B. Lower airway or respiratory passages: -

Trachea: it is wide tube lie in front of the esophagus, it is 12 cm in length and 2.5 cm in width, upper end continuous with the larynx while the lower end divided into two parts bronchus at the level of the 4th thoracic vertebra one right called right bronchus and other left called left bronchus each bronchus divided into bronchiole that more divided into the respiratory bronchioles. The terminal bronchioles more divided into the alveolar ducts end with alveoli.

Alveoli: it looks like sac at the end of the alveolar ducts that surrounded by net of capillaries where the gas exchange occurs.

Lunges: they are two gas exchange organs one right and other left which have apex upward and base downward lie in the thoracic cavity each one surrounded

by the pleura that formed from two layers between them space filled with fluid called pleural fluid that act as lubricant during the respiration

The lung has two surfaces:

1. Costal surface: laterally.

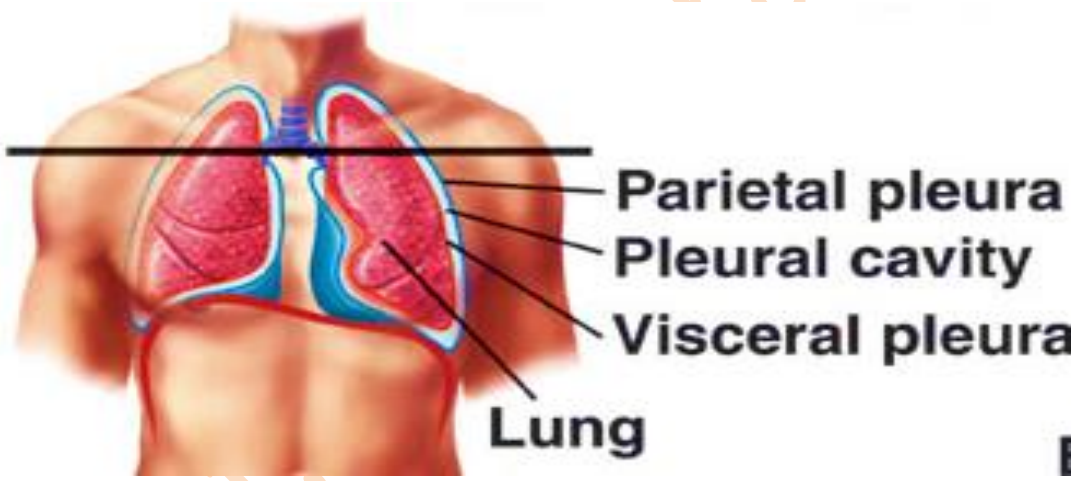
2. Medial surface: medially that has lung hilum which is the area where the bronchus and the blood vessels inter the lung.

The lobes of the lung: the lung divided into lobes by fissure:

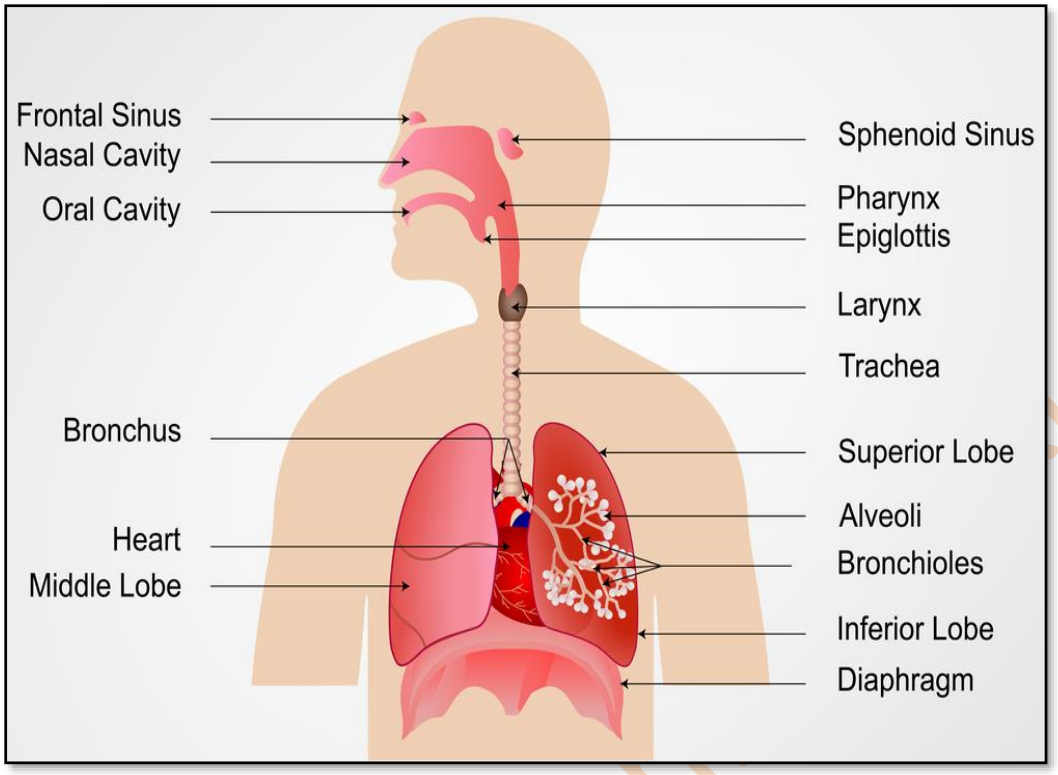
1. The left lung divided into two lobes by the oblique fissure.

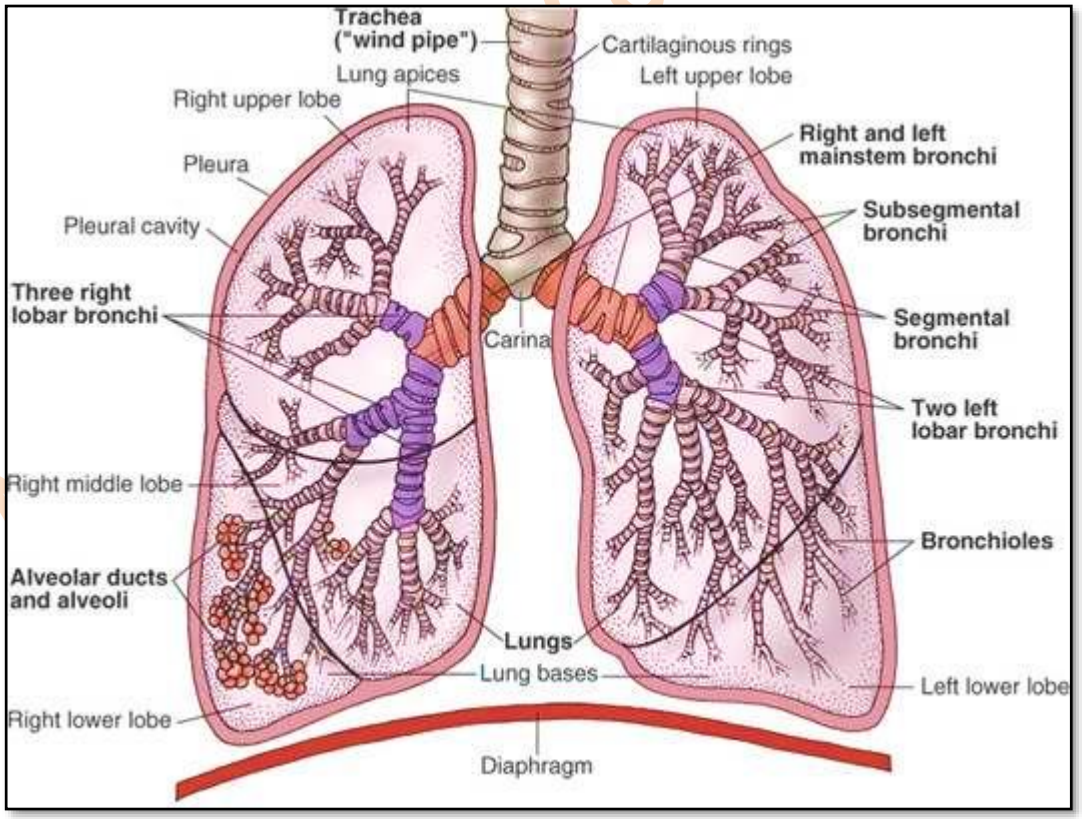
2. The right divided into three lobes by the oblique and horizontal fissure.

Pleura



- Pleural fluid produced by pleural membranes
  - Acts as lubricant
  - Helps hold parietal and visceral pleural membranes together


Frontal Sinus
Nasal Cavity
Oral Cavity
Bronchus
Heart
Middle Lobe
Sphenoid Sinus
Pharynx
Epiglottis
Larynx
Trachea
Superior Lobe
Alveoli
Bronchioles
Inferior Lobe
Diaphragm


Trachea ("wind pipe")
Cartilaginous rings
Lung apices
Left upper lobe
Right upper lobe
Right and left mainstem bronchi
Pleura
Subsegmental bronchi
Pleural cavity
Three right lobar bronchi
Segmental bronchi
Carina
Two left lobar bronchi
Right middle lobe
Bronchioles
Alveolar ducts and alveoli
Lungs
Lung bases
Left lower lobe
Right lower lobe
Diaphragm

Quiz / 3
Define Pharynx.

Quiz / 4
Enumerate the 3 pair's cartilages of larynx.

Quiz / 5
Complete the following statements with correct words: -
Lung has two surfaces: ……. ,……. .

Note: -
-Check your answers in key answer page at the ending of this modular unit.

5/post test

Complete the following statements with correct words: -
1-Respiratory system consist of: ……. and ……. .
2- Bony prominences of nasal cavity called ……..
3- The sinus into nasal cavity is …….. , …… , …… , …….. .
4- Each lung surrounded by …… that formed from ……. layers between them space filled with …….. .

Note: -
-Check your answers in key answer page at the ending of this modular unit.
- (1) degree for each.

6/ Key answer

Pre test		Post test
1. a.	Quiz / 1 see page no. 102.	1. Upper airway, lower airway
2.c.	Quiz / 2 see page no. 103.	2. **conchae**
3. c.	Quiz / 3 see page no. 104.	3. c.
4. a.	Quiz / 4 see page no. 104.	4. d.
5.d.	Quiz / 5 Costal surface medial surface.	5.b.
6.b.		
7.b.		
8. a.		
9. d.		
10.d.		

If you: -
***Got 9 or more you do not need to proceed.**
***Got less than 9you have to study this modular unit very well.**