HUMAN ANATOMY AND PHYSIOLOGY - 1ST

UNIT - 1ST

Syllabus :-

1. Introduction to human body
2. Cellular level of organization
3. Tissue level of organization

CHAPTER - 1ST

Introduction to Human Body

Definition and scope of anatomy and physiology, levels of structural organisation and body system, Basic life processes, Homeostasis, Basic anatomical terminology

- Human Anatomy & Physiology → HAP

It is defined as it is the study of structure and functions of human body.

- Anatomy →

It is the branch of science which deal with the study of structure of different organs (body parts) of human body.

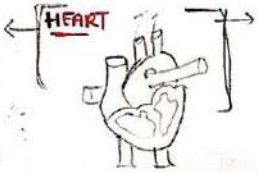
eg. Histology (study about tissue).

- Physiology →

It is the branch of science which deal with the study of functions of different organs (body parts) of human body.

eg. Neurophysiology [study about Neurons].

Anatomy
- Atrium
- Ventricles
- Aorta etc..



Physiology →
- Blood circulation
- exchange de-oxygen to oxygenat blood

- Scope of Anatomy & Physiology

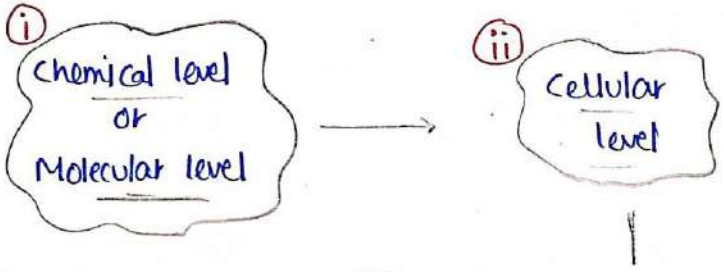
It is about, what we can do from Anatomy & physiology.

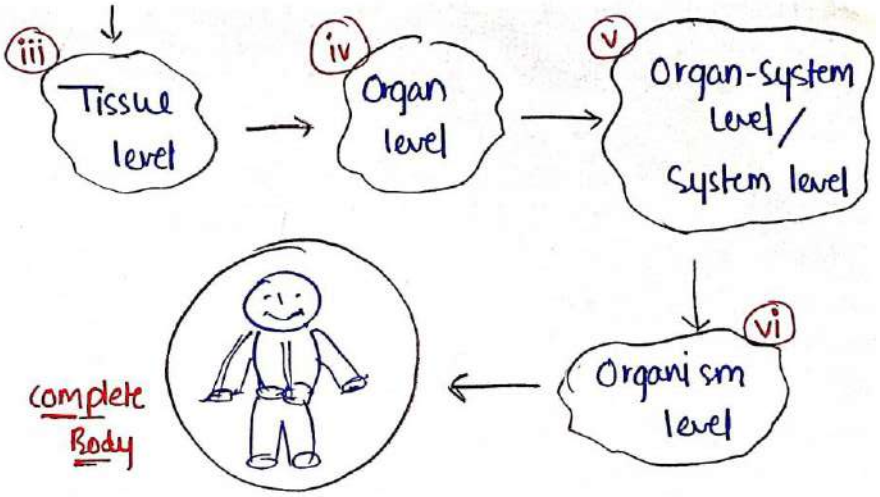
- Study of (structure) and (function) of body parts.
- parameters of normal health such as temp°, pH, basic need etc...
- pathology of disease
- Surgery techniques
- Human evolution and development.

(eg.) Histology - study about (tissue.)

- Levels of Structural (Organisation)

Human body is a six-level organised structure..





i) Molecular/chemical level → It is the most basic level, two or more atom/molecule joined together to form cells.

(eg.) Oxygen (O), Carbon (C), Hydrogen (H) etc.

ii) Cellular level → It is the basic structural and functional level of body. i.e (cell) two or more cells joined together to form tissue

iii) Tissue level → These are the group of cells which works together to perform a particular functions. (eg.) skin.

(eg.) Nervous tissue, Epithelial tissue etc..

iv) Organ level → In this, different-2 types of tissue combine together to form organs which do proper functioning of body. (eg.) Heart, lungs, kidney etc.

v) System level → In this, A group of organs combine together to form system. (eg.) Digestive system, Respiratory system, Cardiovascular system etc.

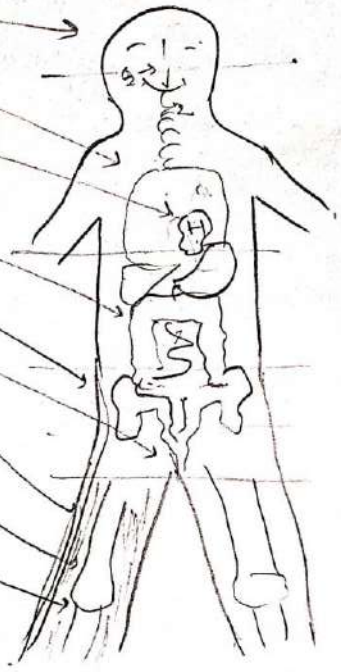
vi) Organism level → It is the highest level and a complete body made up with combined of all system. (eg.) Human Body..

⊙ Body Systems →

A system is a group of organs, which combined together to perform proper functioning.

- There are total (11) system in human body :-

i) Nervous System
ii) Respiratory System
iii) Cardiovascular System
iv) Digestive System
v) Urinary System
vi) Reproduction System
vii) Integumetry System (skin)
viii) Muscular System
ix) Skeletal System
x) Lymphatic System
xi) Endocrine System



i) Nervous System →

It cordinate all the actions of the body. It is responsible for all voluntary and involuntary action and also for all signalling (eg.) Brain, spinal cord etc..

ii) Respiratory System →

It involves respiration [$O_2 \rightleftharpoons CO_2$].

iii) Cardiovascular System →

It is responsible for the circulation of blood in body, that's why it also known as circulatory system.

Organs → Heart, blood vessels, blood etc.

iv) Digestive system →

It is responsible for digestion of food and absorb nutrients from it.

Organs → Mouth, stomach, intestine etc..

v) Urinary System →

It is responsible for the filteration of blood and also removes the waste. organs → kidney, Urethra, bladder etc..

vi) Reproductive system →

It is responsible for the production of offsprings.

organs → Testes etc.. ovary, fallopian tube..

vii) Integumetry system →

It is also known as exocrine system, because it contain skin which provide protection and also contain glands (eg) skin, hair, Nails, sweat etc.

viii) Muscular System →

It is responsible for the movement of our body organs through muscles.

ix) Skeletal system →

It contain bones which maintain structure and provide protection to our body. (eg) skull, Ribs, femur etc.

x) Lymphatic System →

Also known as immune system.

It defends the body against pathogens that may harm the body.

This system consist of network of lymphatic vessels that carry a clear fluid called lymph.

xi) Endocrine System →

A system consists of different types of hormones which helps in functioning of body. (eg) T_3 & T_4.

• BASIC LIFE PROCESS → Non-living से अलग बनाती है।

Human body performs diff-2 functions for its survival and growth, so all the living organism have some specific life processes.

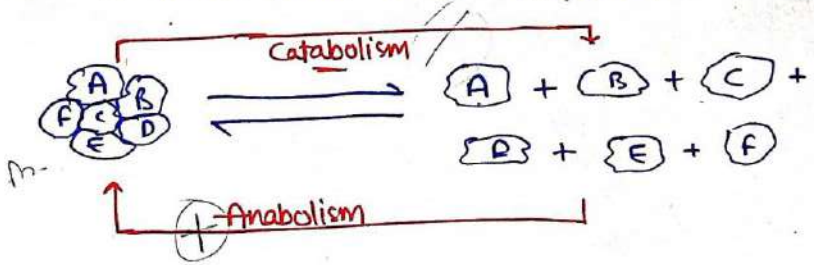
i) Metabolism
ii) Responsiveness
iii) Movement
iv) Growth
v) Differentiation
vi) Reproduction
vii) Respiration

i) Metabolism → It is the sum of all chemical process that occurs in the body.

• It is of two types :—

a) Catabolism → It is the breakdown of complex chemical substance into the simple compound.

b) Anabolism → It is the building up of complex chemical substance from small components.



ii) Responsiveness → It is the ability of the body to detect and respond to changes. eg. cold, sensitivity etc..

iii) Movement → It includes motion of the whole body individual organs etc..

iv) Growth → It is the development of our body and also increase in body size

v) Differentiation → It is the development of cell from an unspecialized to a

to a specialized state

(eg.) stem cell generate complete human body.

vi) Reproduction →

It refers to the formation of new cells and also produce new offsprings. (eg.) foetus..

vii) Respiration →

It involves the exchanges of O_2 and CO_2 b/w the cell and the external environment.

viii) Digestion →

It involves the degradation of food and large molecules.

It is also responsible for the absorption of nutrients into blood.

ix) Excretion →

It is the process of removal of waste products from the body.

(eg.) urination etc.

- HOMEOSTASIS →

It is derived from two (greek) word -

Homeostasis

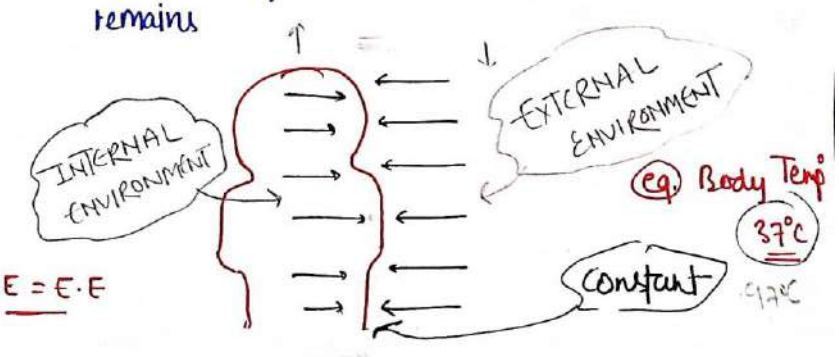
Homeo + stasis

Homeo → same / constant

stasis → state

- It means staying the same.
- It is a condition when our internal environment is constant with respect to external environment.
- It is a condition that may vary but v relatively constant.

remains



- HOMEOSTASIS CONTROL MECHANISM

All the body organs coordinate with each other to maintain homeostasis.

This coordination is mainly controlled by Neuroendocrine system [Nervous + Endocrine system].

- It has three components :-

i) Receptors :-

It is a type of (sensor,) which recieve/detect changes or other stimuli.

ii) Control centre :-

It recieve the stimuli from receptors and analyse it.

iii) Effectors / feedback system :-

If there are any change take place in internal environment, then feedback system is take back into its constant state or in homeostasis

- It is of two types :-

1) Positive feedback system (+) → to (↑) increase
2) Negative feedback system (-) → to (↓) decrease

1) Positive feedback system →

Used to increase..

When anything is decrease in our internal environment, then (it) P.F.S is try to back into its normal situation by increasing it.

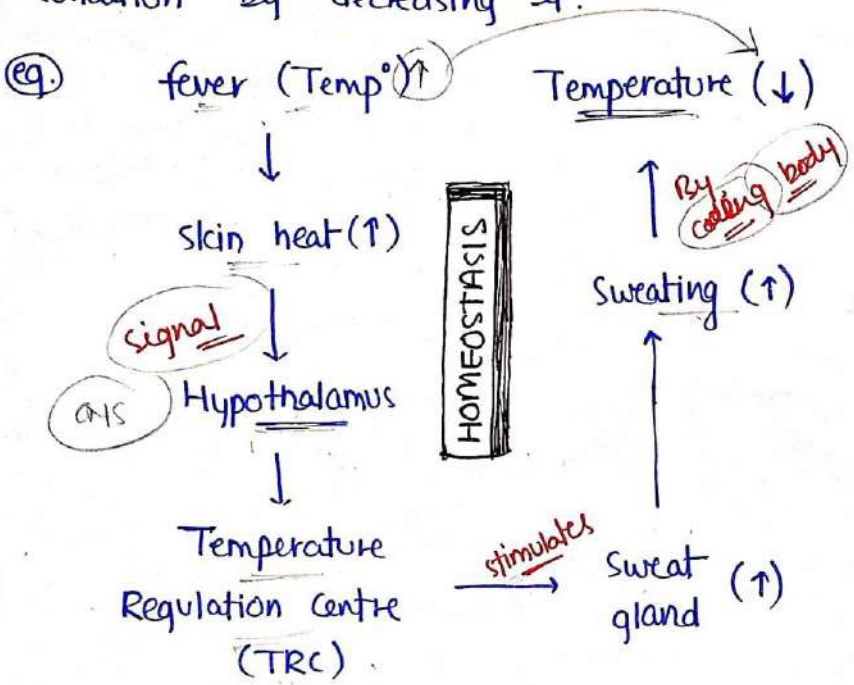
(eg) During childbirth, it stimulate the release of (oxytocin) which increases the contraction of the uterus to help in childbirth.

2) Negative feedback system →

Used to decrease..

When anything is increase in our

internal environment (body), then this system is try to back into normal condition by decreasing it.



- BASIC ANATOMICAL TERMINOLOGY

It is divided into three groups :-

1) Directional terms
2) Sectional planes / planes of the body.
3) Body Cavities.

1) Directional terms →

- Superior (upper, cranial) → upper part
- Inferior → Lower part
- Anterior end → front part
- Posterior end → Back side

2) Sectional planes →

- Sagittal plane → divides body into left and right part.
- Transverse plane → It is horizontal axis parallel to the ground and passes through the body at 90° angle and divides body into two parts
- Coronal plane → divides body into anterior and posterior parts.

3) Body Cavities →

- Thoracic Cavity
- Dorsal cavity
- Abdominal & Pelvic Cavity