

# UNIVERSITY SOLVED QUESTION WITH ANSWER

**Year** : 2021-22

**Subject** : HAP II

**Subject Code** : 23PBP201

**Subject In-Charge** : Ms. Adyasha Senapati, Ms. Monali Padhi,  
Mr. Arun Aniket Das





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BP201T

2<sup>nd</sup> Semester Regular / Back Examination: 2021-22

HUMAN ANATOMY AND PHYSIOLOGY -II

BRANCH(S): B.Pharma

Time : 3 Hour

Max Marks: 75

Q.Code: J433

Answer Question No.1 (Part-1) which is compulsory, any eight from Part-II and any two from Part-III.

The figures in the right hand margin indicate marks.

**Q1** Answer the following questions : **Part-I** (2 × 10)

- Define synapse.
- What is Peptic ulcer?
- Define vital capacity?
- Write the composition of gastric juice.
- What is Cushing's syndrome?
- Write the disorders due to hyper and hypo secretions of growth hormone.
- Describe the anatomy and physiology of Fallopian tubes.
- Write the anatomy and physiology of Medulla oblongata.
- Write a note on cerebrospinal fluid.
- Write the functions of pineal gland.

**Q2** Focused-Short Answer Type Questions- (Answer Any Seven) **Part-II** (5 × 7)

- Write the location, structure and functions of liver.
- Write a note on digestion and absorption of nutrients in GIT.
- Write a note on meninges of brain.
- Write short notes on Renin Angiotensin system.
- Write a note on process of urine formation.
- Write detail note on pancreatic hormones.
- Describe the hormones of thyroid gland and their functions.
- What is Spermatogenesis?
- Write note on physiology of menstruation.

**Q3** Long Answer Type Questions (Answer Any Two) **Part-III**

Define CNS. (2)  
Write different parts of brain with labeled diagram. (4)  
Add a note on structure and functions of cerebrum. (4)

**Q4** With neat and labeled diagram describe different parts of digestive system. (5)  
Write the mechanism of acid production and regulation. (5)

**Q5** Define hormone. (2)  
Write in detail about hormones of the pituitary gland. (5)

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ij) Write note on physiology of menstruation.

Part-III

Long Answer Type Questions (Answer Any Two)

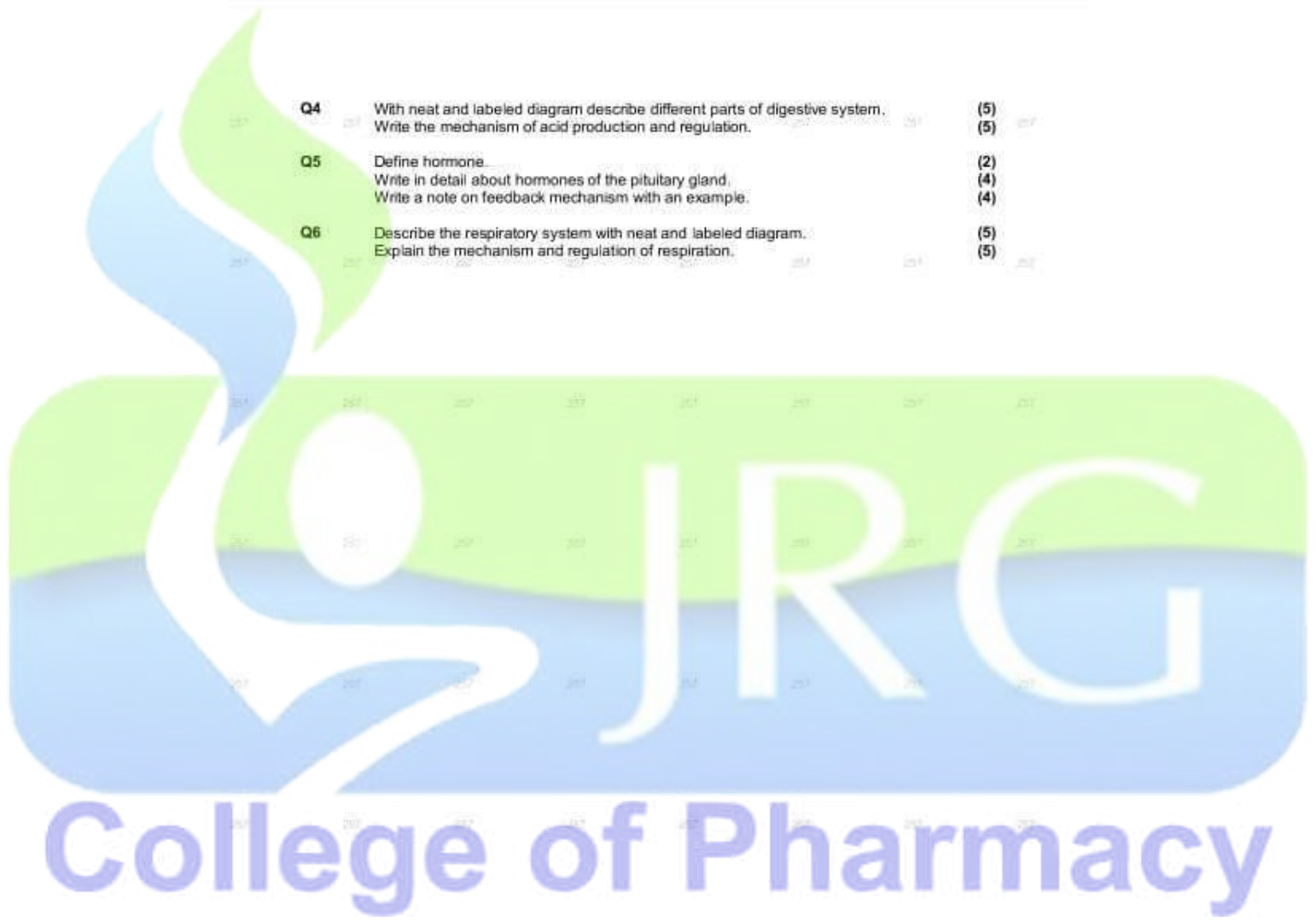
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- Q4 With neat and labeled diagram describe different parts of digestive system. (5)  
Write the mechanism of acid production and regulation. (5)

- Q5 Define hormone. (2)  
Write in detail about hormones of the pituitary gland. (4)  
Write a note on feedback mechanism with an example. (4)

- Q6 Describe the respiratory system with neat and labeled diagram. (5)  
Explain the mechanism and regulation of respiration. (5)



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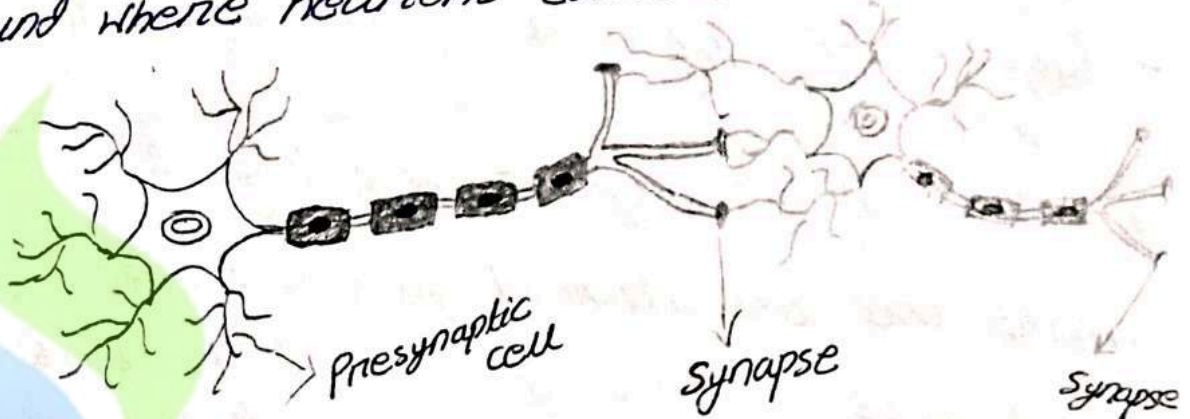


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21. Answer the following questions: [2x10]

Q. Define Synapse.

A. A synapse is the junction between two neurons that allows a signal to pass between them. Neurons are cells that transmit information between your brain and other parts of the central nervous system. Synapses are found where neurons connect with other neurons.

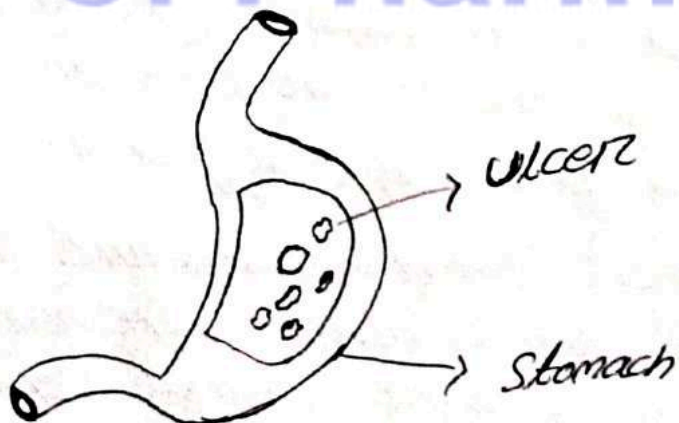


Q. What is Peptic ulcer?

A. Peptic ulcer disease is a digestive disorder caused by the erosion of the mucosal lining in the stomach or small intestine. Peptic ulcer disease also known as gastric ulcer.

→ It is two types (i) Gastric Ulcer :- It occurs in stomach due to reduce defensive and protective factor.

(ii) Duodenal Ulcer :- It occurs in the duodenum often occurs due to enhanced secretion of acid.



© Define Vital Capacity.

A7 Vital Capacity (VC) is the maximum amount of air a person can exhale after inhaling as much as possible. It is a measure of how well a person can breathe deeply and cough.

→ A spirometer is used to measure vital capacity.

→ factors affecting vital capacities are Age, Sex, Height, Mass.

→ It is used for diagnose lung disease.

① Write the composition of gastric Juice.

A7 Gastric Juice is primarily composed of water, hydrochloric acid (HCl), Pepsinogen (which converts to pepsin), mucus, and intrinsic factor; with the main component being (HCl) Hydrochloric acid, which gives gastric Juice its highly acidic nature.

→ Some minor components are Electrolytes and Gastric lipase.

② What is Cushing's syndrome?

A7 A condition that occurs from exposure to high cortisol levels for a long time.

The most common cause is the use of steroid drugs, but it can also occur from an overproduction of cortisol by the adrenal glands.

The other common causes are endogenous due to excess adrenocorticotropic hormone (ACTH) dependent, ACTH-independent adrenal adenoma, and hyperplasia.

(F) Write the disorders due to hyper and hypo secretions of growth hormone.

A7 Hyper Secretion of growth hormone cause

- (i) Gigantism
- (ii) Acromegaly
- (iii) Acromegalic gigantism

Hypo secretion of growth hormone cause

- (i) Dwarfism
- (ii) Acromicria
- (iii) Simmond Disease

(G) Describe the anatomy and physiology of fallopian tubes.

A7 The fallopian tubes are muscular, hollow tubes that connect the ovaries and uterus. They are also known as uterine tubes or oviducts.

→ It is J-shaped and about 10-12 centimeters in long.

→ The fallopian tubes receive blood from the uterine and ovarian arteries.

→ The fallopian tubes transport the egg from the ovary to the uterus. Fertilization usually takes place in the fallopian tubes.

→ The cilia in the fallopian tubes help to move the egg towards the uterus. The smooth muscle in the fallopian tubes also contracts to help move the egg and sperm.

h) Write the anatomy and physiology of Medulla Oblongata

A) The Medulla Oblongata, often simply called the 'Medulla' is the most inferior part of the brainstem, connecting directly to the spinal cord through the foramen magnum at the base of the skull.

→ Situated at the base of the brain, below the pons and directly above the spinal cord.

→ Functions of Medulla oblongata are

- i) Respiratory control
- ii) Cardiovascular Regulation
- iii) Swallowing Reflex
- iv) Cough and sneezing
- v) Taste Perception

i) Write a note on cerebrospinal fluid.

A) Cerebrospinal fluid (CSF) is a clear, colourless fluid that surrounds and cushions the brain and spinal cord, acting as a protective barrier against impact and providing essential nutrients to the central nervous system while removing waste products.

ii) Write the functions of Pineal gland.

A) The primary function of the pineal gland is to produce and secrete the hormone melatonin, which plays a crucial role in regulating the body's circadian rhythm (sleep-wake cycle) by responding to light cues from the environment, producing more melatonin during darkness and less during daylight hours, thereby promoting sleep at night.

→ It also influence the onset of puberty by interacting with reproductive hormones.

## 2. Focoused - Short Answer Type Question [5x7]

2. Write the location, structure and function of liver.

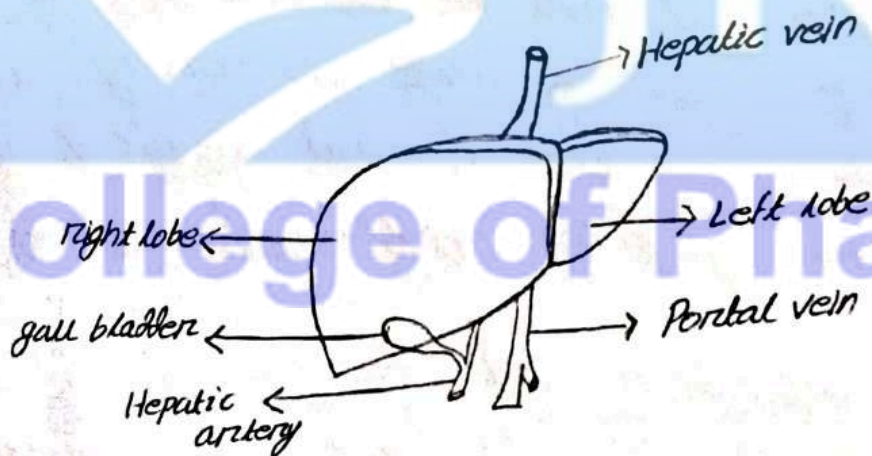
2. The liver is located in the upper right portion of the abdomen. It is the largest gland in the human body that performs several important functions. It is the only organ that has the ability to regenerate efficiently.

Structure of liver :- The liver is a triangular, bilobed structure consisting of a larger right lobe and a smaller left lobe. The falciform ligament separates the two lobes.

A layer of fibrous tissue called Glisson's capsule covers the liver. This capsule is covered by the peritoneum. This protects the liver from physical damage.

It has two main source of blood (i) Hepatic portal vein. Which carries nutrient rich blood from the digestive system.

(ii) Hepatic Artery :- Carries oxygenated blood from Heart.



Functions of liver :-

- (i) Production of Bile :- Which helps in the digestion and absorption of fats, vitamins and cholesterol is produced in the liver.
- (ii) Metabolization of fats :- Bile helps in the breakdown and digestion of fats.

(iii) Absorption of Bilirubin :- Bilirubin is formed by the breakdown of haemoglobin. The iron released is stored in the liver to make next-generation blood cells.

(iv) Albumin Production :- Albumin transports fatty acids and steroids to maintain correct pressure and prevent leakage of blood vessels.

(v) Regeneration of liver :- The liver has the ability to regrow in all vertebrates. The functions of the liver are not lost during the growth process. In humans, regeneration take 8-15 days. In mice, the same process take around 5-7 days.

(6) Write a note on digestion and absorption of nutrients in GIT.

A7 Digestion and absorption of nutrients in the GIT is a complex process where food is broken down into smaller molecules (like carbohydrates, proteins and fats) that can be absorbed into the bloodstream through the lining of the small intestine, primarily occurring through a series of mechanical and chemical actions involving various digestive organs and enzymes.

Key Stages of Digestion and Absorption :

Ingestion :- The initial intake of food through the mouth.

Mechanical Digestion :- Physical breakdown of food into smaller pieces by chewing (in the mouth) and churning (in the stomach).

Chemical Digestion :- Enzymatic breakdown of complex food molecules into simpler forms, facilitated by digestive juices secreted by the salivary glands, stomach, liver (bile) and pancreas.

Absorption :- Movement of digested nutrients from the lumen of the small intestine into the blood stream and lymphatic system.

Elimination :- Undigested waste products are expelled from the body as feces through the large intestine.

Major sites of Digestion and Absorption :

Mouth :- Saliva containing salivary amylase begins the digestion of carbohydrates.

Stomach :- HCl denatures proteins, while pepsin enzyme further breaks down proteins.

Small Intestine :- The primary site of nutrient absorption, where most carbohydrates, protein, fats, vitamins and minerals are absorbed.

Large Intestine :- Primarily absorbs water and electrolytes, while some vitamins produced by gut bacteria are absorbed here.

Key Nutrients and Their Digestion :

Carbohydrates :- Broken down into monosaccharides by salivary amylase and pancreatic amylase.

Proteins :- Hydrolyzed into amino acids by pepsin in the stomach, and pancreatic proteases (trypsin, chymotrypsin) in small intestine.

Lipids :- Emulsified by bile acids from the liver, then broken down into fatty acid and glycerol by pancreatic lipase.

© Write a note on meninges of brain.

A7 The meninges are three layers of protective membranes that envelop the brain and spinal cord, collectively known as the central nervous system (CNS): the dura mater (outer layer), arachnoid mater (middle layer) and pia mater (inner layer). Their primary function is to protect the brain from trauma, provide support for blood vessels, and contain cerebrospinal fluid (CSF) which acts as a shock absorber.

### Structure and Function of each layer:

Dura Mater: The tough, outermost layer, composed of dense connective tissue that adheres to the inner surface of the skull. It forms folds that separate different brain regions, such as the falx cerebri (between cerebral hemispheres) and the tentorium cerebelli (over the cerebellum).

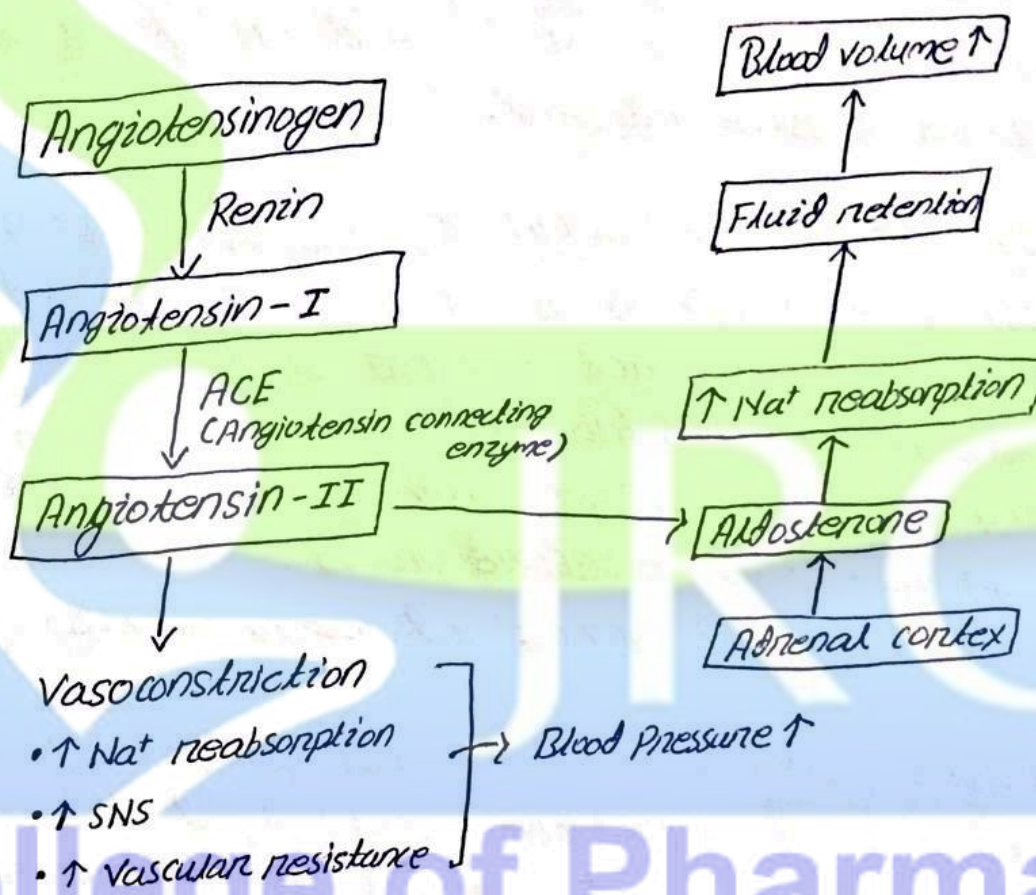
Arachnoid Mater: A delicate, web-like middle layer that lies beneath the dura mater. The subarachnoid space, filled with CSF, is located between the arachnoid mater and the pia mater.

Pia Mater: The thin, innermost layer that closely adheres to the brain's surface, following its contours and carrying blood vessels into the brain tissue.

- The meninges are vital for maintaining the structural integrity of the brain and protecting it from injury.
- Any damage to the meninges can potentially lead to serious neurological complications.

Q) Write short notes on Renin Angiotensin System.

- Q77) Renin Angiotensin Aldosterone system
- It plays an important role in regulating blood pressure, fluid balance and electrolyte balance in body.
  - It starts, when liver releases Angiotensinogen and kidney releases Renin.
  - It mainly increases the fluid retention, reabsorption and blood pressure.



Q) Write a note on process of urine formation.

A7) Urine is a liquid waste product produced by the nephrons of kidney.

→ It is a clear, yellowish fluid that carries waste and excess substances out of the body.

→ Normal urine output is 1-1.5 Ltr/day.

Formation of urine :- It involves three steps :-

- (i) Filtration
- (ii) Reabsorption
- (iii) Secretion

(i) Filtration :- Also known as 'ultrafiltration or glomerular filtration'.

-> It is a process by which nephron / kidney filter waste and excess fluids from the blood.

-> The filtered blood, called the filtrate, which contains water, ions, glucose, amino acids and waste product like urea.

-> Normal Glomerular Filtration Rate (GFR) is 125 ml/min

-> Approx kidney filter 180 Ltr blood per day, but almost 99% filtrate reabsorb into blood.

(ii) Reabsorption or Tubular reabsorption :- It is the process by which kidneys reabsorb water, ions and other essential nutrients back into the blood stream from the filtrate in the renal tubules.

-> After reabsorption, the remaining waste products continue through the tubules to become urines.

-> It maintain acid balance and water balance.

(iii) Tubular Secretion :- It is a process by which kidney secretes unwanted substances (not filtered in Bowman's capsule) from the blood into the filtrate in the renal tubules.

-> It secretes :- Hydrogen ion,  $K^+$ , Ammonia (in PCT)

- urea (in loop of henle)

-  $K^+$ ,  $H^+$  (in PCT)

-  $K^+$  (in collecting duct)

-> Then, these all filtrate collect in collecting ducts from multiple nephrons and excreted through urethra in the form of urine approx 1-1.5 L/day.

④ Write detail note on pancreatic hormones.

④ Pancreas :- It is a composite organs that acts as both exocrine & endocrine gland.

→ Exocrine pancreas produce enzymes and contains about 95% part.

→ Endocrine pancreas produce hormones and contains only 5% part.

→ It is present at the posterior part of stomach. It extends between the C-shaped curvature of duodenum and the spleen. It contains head, body and tails.

### Endocrine Pancreas Gland

① Alpha Cells → Secrete glucagon

② Beta cells → Present in more amount, Secrete Insulin

③ Delta cells → secretes Somatostatin (GHRH)

Glucagon :- It is a peptide hormone, produced by the  $\alpha$ -cells of Islets Langerhans.

→ It is used to ~~take~~ increase the blood glucose levels.

→ It stimulates glucoferolysis (breakdown of glycogen to glucose).

→ stimulates glucoferogenesis (Production of glucose from pyruvate)

→ Increases glucofer release from the liver into blood stream.

→ It counter acts the effect of insulin.

INSULIN :- It is a peptide hormone produced by the Beta cells of islets of Langerhans that regulates blood glucose levels by facilitating glucose uptake in cells.

→ It stimulates glucose uptake in cells, particularly in muscle and liver cells.

→ It regulates fat metabolism, promoting lipid synthesis and storage.

→ Its main role is to prevent diabetes mellitus. @

Somatostatin :- It is produced by delta cell of islets of Langerhans, and also produced by hypothalamus.

→ The main role of somatostatin is to inhibit the secretion of both insulin and glucagon in addition to inhibiting the secretion of GH (Growth hormone) from anterior pituitary.

Q) Describe the hormones of Thyroid gland and their functions.

A) It is the largest endocrine gland situated in the neck in front of the larynx and trachea at the level of the 5<sup>th</sup>, 6<sup>th</sup>, 7<sup>th</sup> cervical and 1<sup>st</sup> thoracic vertebrae.

→ It is about ~~15 gm~~ 25 gm and its lobes are roughly cone shaped, about 5 cm long and 3 cm wide.

→ It is H-shaped / Butterfly shaped organ their lobes are inter connected by isthmus

→ It secretes mainly two types of hormones :-

(i) Thyroid hormones ( $T_3$  &  $T_4$ )

(ii) Calcitonin.

Thyroid Hormones :- There are mainly two hormones i.e. Tri-iodothyronine ( $T_3$ ) and Thyroxine ( $T_4$ )

→ The release of  $T_3$  and  $T_4$  is controlled by Thyroid stimulating hormone (TSH) released from anterior pituitary, which is stimulated by Thyrotropin Releasing hormone (TRH) from Hypothalamus.

Functions :- These are essential for normal growth and development, especially of the skeleton and nervous system.

→ It also known as master hormones, because it influenced other organs / system.

→ It regulate BMR, Metabolism of proteins, fats & carbohydrates

→ Control urine output, development of mental facilities.

Calcitonin :- Also known as Thyrocalcitonin (CTCT), it is a peptide hormone released from the parafollicular cells of thyroid gland.

→ It is basically used to regulate the calcium level in the blood.

→ It inhibits the bone resorption (decrease osteoporosis/osteoclast), lowers the level of  $Ca^{2+}$  in blood (↓ hypercalcaemia).

ii) What is Spermatogenesis?

→ It is the process by which immature cells develop into mature sperm cells. This process occurs in the seminiferous tubules of the testes and take approx 70-80 days to complete.

Stages of Spermatogenesis :

i) Spermatogonia :- Immature cells that develop into sperm cell. These are (7-10 days) diploid (46 chromosomes) and stem cells of male reproductive system.

ii) Spermatocytogenesis :- Spermatogonia undergoes mitosis to produce two spermatocytes. One remains in basement as stem cell and other in meiosis. It takes (20-25 days)

iii) Meiosis :- Primary spermatocytes undergoes meiosis I, produce two haploid secondary spermatocytes. These undergoes meiosis II, produce four haploid spermatids (round cells with no tail).  
↓ (10-14 days)

iv) Spermiogenesis :- Spermatids convert into mature sperm, in which sperm fully develops.  
↓ (10-15 days)  
↓  
in epididymis.

(i) Write note on Physiology of ~~Menses~~ Menstruation.

A7 The menstrual cycle is a monthly process in which a female's body prepares for a potential pregnancy, involving hormones, changes, ovulation and uterine lining (endometrium) growth, ending with menstruation (Periods) if pregnancy doesn't occur.

Menstrual cycle :- The menstrual cycle is counted from the first day of one period to the first day of next.

→ It is not same for everyone. generally it happens in 28 days. but it varies from 21-35 days.

→ This cycle is divided into four phases, which involves hormonal and physiological changes.

- (i) Menstruation (Day 1-5)      First menstruation → Menarche
- (ii) Follicular Phase (Days 6-14)      Last menstruation → Menopause  
(Stop permanently)
- (iii) Ovulation (Day 14)
- (iv) Luteal Phase (Day 15-28)

Menstruation Phase (Days 1-5) vary also (2-7 days)

→ It involves menstrual bleeding, in which uterus sheds its lining (endometrium) resulting in vaginal ~~to~~ bleeding.  
(Periods).

→ It is due to decreasing level of estrogen & progesterone.  
→ In this phase, cervix produce mucus which help to flush out the uterus.

Follicular Phase : It involves the development of multiple follicles in the ovaries, stimulated by follicle stimulating hormone.

→ One follicle becomes dominant, which is chosen for ovulation (release of egg/ovum).

→ Also estrogen levels increase to thicken the uterine lining (endometrium)

## Ovulation (Day 14)

→ It involves the release of egg (ovum) from the dominant follicle release into fallopian tube. The egg is viable for fertilization for 12-24 hours.

→ In this ovulation is triggered by Luteinizing hormone (LH) which is released from pituitary gland.

Luteal Phase :- In this, the empty follicle transforms into corpus luteum which produce progesterone.

→ Now this increased level of progesterone, prepared the uterus for implantation.

→ Now this uterus is receptive to implantation for 4-5 days

→ Final → If fertilization / pregnancy occurs, the embryo / zygote implants in the uterus. If not occurs, then the corpus luteum degenerates and progesterone levels drop / decreases which leads to menstruation.

Q3 LONG ANSWER TYPE QUESTIONS

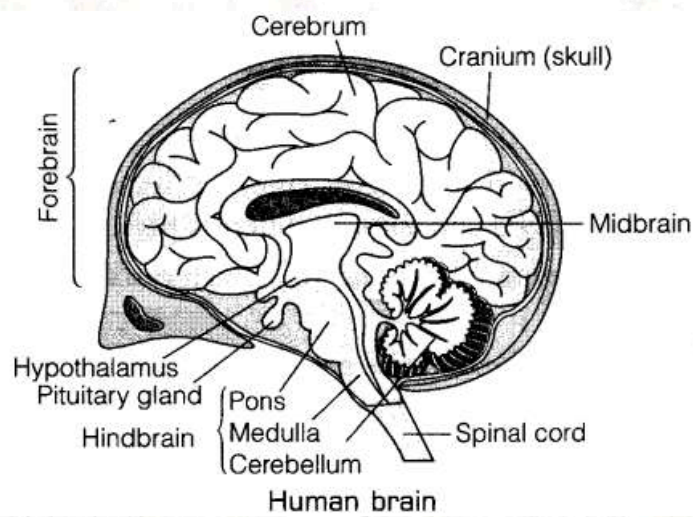
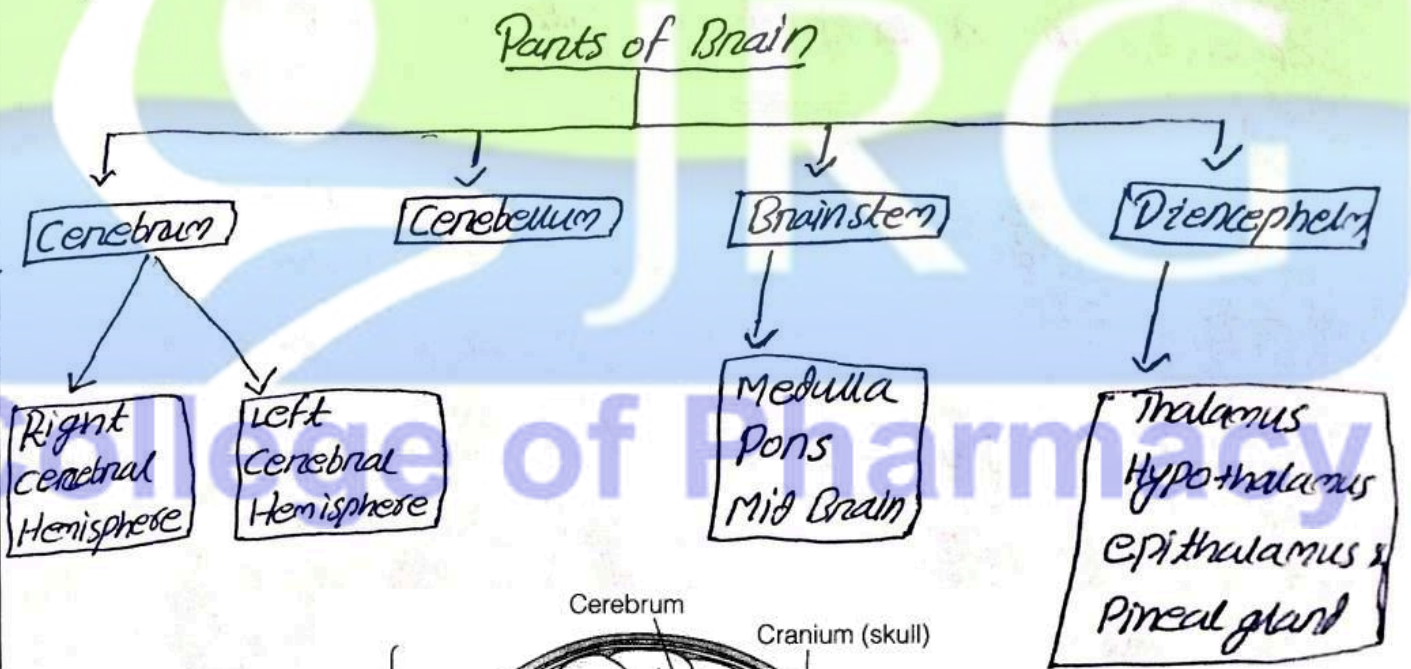
3. Define CNS  
Write different parts of brain with labeled diagram.  
Add a note on structure and function of cerebrum.

A7 The central nervous system is responsible for integrating sensory information and respond accordingly.  
It is the part of the nervous system consisting primarily of the brain and spinal cord.

Brain:- It is organ of soft nervous system (tissue) contained in the skull of vertebrates, functioning as the coordinating centre of the body.

→ The brain is contained in skull and weight 1300-1400 gm

→ Made up of 100 billion neuron, & each neuron is surrounded by about 10 glial cells.



Cerebrum:- It is the largest section of the brain and it is located in the upper portion of the brain.

→ The outermost layer of cerebrum is made up of gray matter and this is 2-4mm thick and it is called "cerebral cortex". It contains millions of neurons.

→ During embryonic development, the brain size increases rapidly, the gray matter of the cortex enlarges much faster than deeper white matter so as a result cubical region folds and folds upon itself.

The folds are called "gyri" or 'convolutions'.

↳ The deepest grooves b/w the folds are called "Sulci" "Fissures"

↳ The shallow grooves b/w folds are called 'Sulci'

→ The most prominent fissure, the longitudinal fissure, separates the cerebrum into right and left halves called "cerebral hemisphere". Each hemisphere has 4 lobes.

→ Both hemispheres are connected by a bridge of nerve fibres that relay information b/w two hemispheres called "corpus callosum".

→ Lobes of cerebrum are

- (i) Frontal lobe
- (ii) Parietal lobe
- (iii) Occipital lobe
- (iv) Temporal lobe

Functions of Cerebrum:-

- Motor functions like control of voluntary movement.
- Sensory functions like perception of pain, temperature, touch, pressure, hearing, taste and smell.
- Control of intelligence, speech, memory and learning etc.

4. With neat and labeled diagram describe different parts of digestive system. Write the mechanism of acid production and regulation.

A → Digestive system is a network of organs and tissue that work together to perform Digestion.

→ Digestion is a complex process that involves the break down and absorption of nutrients from ingested food.

→ This system consist of Gastrointestinal (GI) tract, Accessory organs and the digestive process.

→ The Digestive system has mainly four functions:-

(i) Ingestion: Food enters the mouth

(ii) Digestion: Involves mechanical (chewing), chemical digestion (enzymes break down nutrients).

(iii) Absorption:- Nutrients are absorbed into the blood.

(iv) Elimination:- Waste is eliminated through feces.

→ Digestive system includes organs from mouth to Anus

→ It consists of :-

(i) Mouth/ oral cavity

(ii) Pharynx

(iii) oesophagus

(iv) stomach

(v) Small Intestine

(vi) Large Intestine

(vii) Rectum / Anus

Accessory organs

(i) Salivary gland

(ii) Liver

(iii) Gall bladder

(iv) Pancreas

→ Layers of GI Tract:-

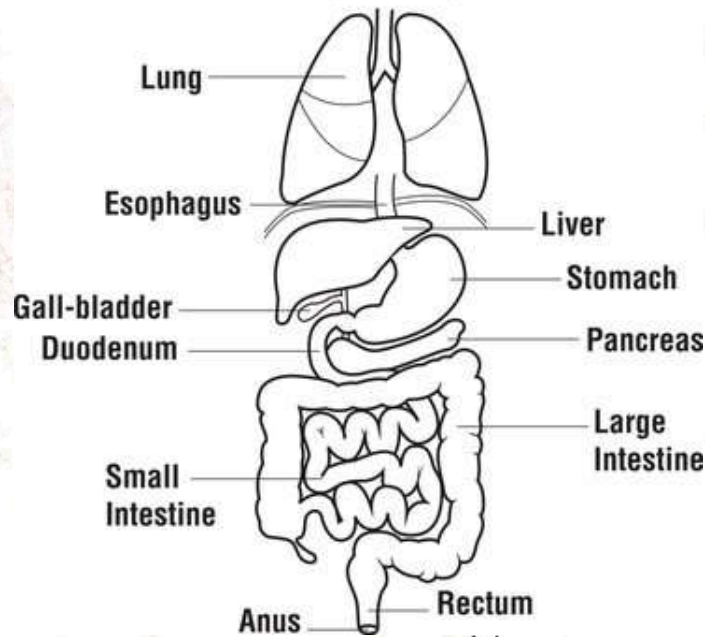
(i) Mucosa - Innermost layer

(ii) Submucosa

(iii) Muscularis :- Layer of smooth muscle

(iv) Serosa :- outermost layer

## Human Digestive System



### Mechanism of acid Production & Regulation

→ It is a complex process, which involves the production of HCl (Acid) in the stomach from the parietal cell.

→ HCl is a strong acid, which is essential to maintain a low pH (1-3) in stomach.

- Digestion of protein or other food
- Killing ingested bacteria

→ The production of HCl is regulated by the PNS and hormones such as gastrin and histamine.

→ It involves several steps:-

$\text{CO}_2$  diffuse into parietal cell

↓  
react with  $\text{H}_2\text{O}$  & form  $\text{H}_2\text{CO}_3$  in the presence of carbonic Anhydrase enzyme

↓  
 $\text{CO}_2 + \text{H}_2\text{O} \rightarrow \text{H}_2\text{CO}_3$ , It dissociates into  $\text{HCO}_3^-$  ions +  $\text{H}^+$  ions

↓  
 $\text{HCO}_3^-$  moves into blood &  $\text{H}^+$  ions into lumen of stomach through  $\text{H}^+/\text{K}^+$  ATPase

↓  
 $\text{Cl}^-$  also diffuse into lumen of stomach, where it form HCl by diffusing with  $\text{H}^+$ .  $\text{H}^+ + \text{Cl}^- \rightarrow \text{HCl}$

5. Define hormone  
Write in detail about hormones of the pituitary gland.  
Write a note on feedback mechanism with an example.

177 A hormone is a chemical messenger that travels through the body to control how organs and cells function. Hormones are produced in trace amounts by glands and other tissues in the body, and are essential for life and health.

Functions :- Regulate bodily processes  
→ Maintain homeostasis

Example :- Insulin, Thyroid hormone, Aldosterone etc.

Pituitary Gland :- It is referred as 'master gland' because it monitors and regulates many bodily functions also control other glands.

→ It is the small organ (diameter - 1cm, weight - 0.5g)  
It is located within "sella turcica" at the base of the brain in the sphenoid bone. below the hypothalamus.

→ It is divided into two parts/lobes

① Anterior Pituitary

② Posterior Pituitary

Anterior Pituitary - contains about 75% of total weight, mainly considered as master gland and made up of pharyngeal epithelium.

→ It secretes hormones

① Growth Hormones :- It is a peptide hormones that stimulate growth and cell reproduction.

→ The secretion of growth hormone from anterior pituitary is controlled by hypothalamus through GH releasing factor.

① Thyroid Stimulating Hormone (TSH) :- It is a glycoprotein hormone, which stimulates the production of  $T_3$ ,  $T_4$  from the Thyroid gland.

② Adrenocorticotropic Hormone (ACTH) :- It is a peptide hormone which stimulate production of corticosteroid from adrenal glands.

③ Prolactin (PRL) :- It is a protein hormone which plays crucial role in lactation and breast feeding.

→ It stimulates milk production in the mammary glands during pregnancy and breast feeding.

④ Gonadotropins :- These are group of protein hormones that regulates the functions of the gonads (ovaries and testes).

Posterior Pituitary :- around 25% and made up of axon & axon terminals (nervous system).

→ It secretes hormones

① Oxytocin :- It is a peptide hormones which plays a major role in child birth and lactation.

→ It stimulates uterine contractions during child birth.

→ Regulate milk during lactation.

② Antidiuretic Hormone (ADH) :- also known as vasopressin which regulates water balance and blood pressure.

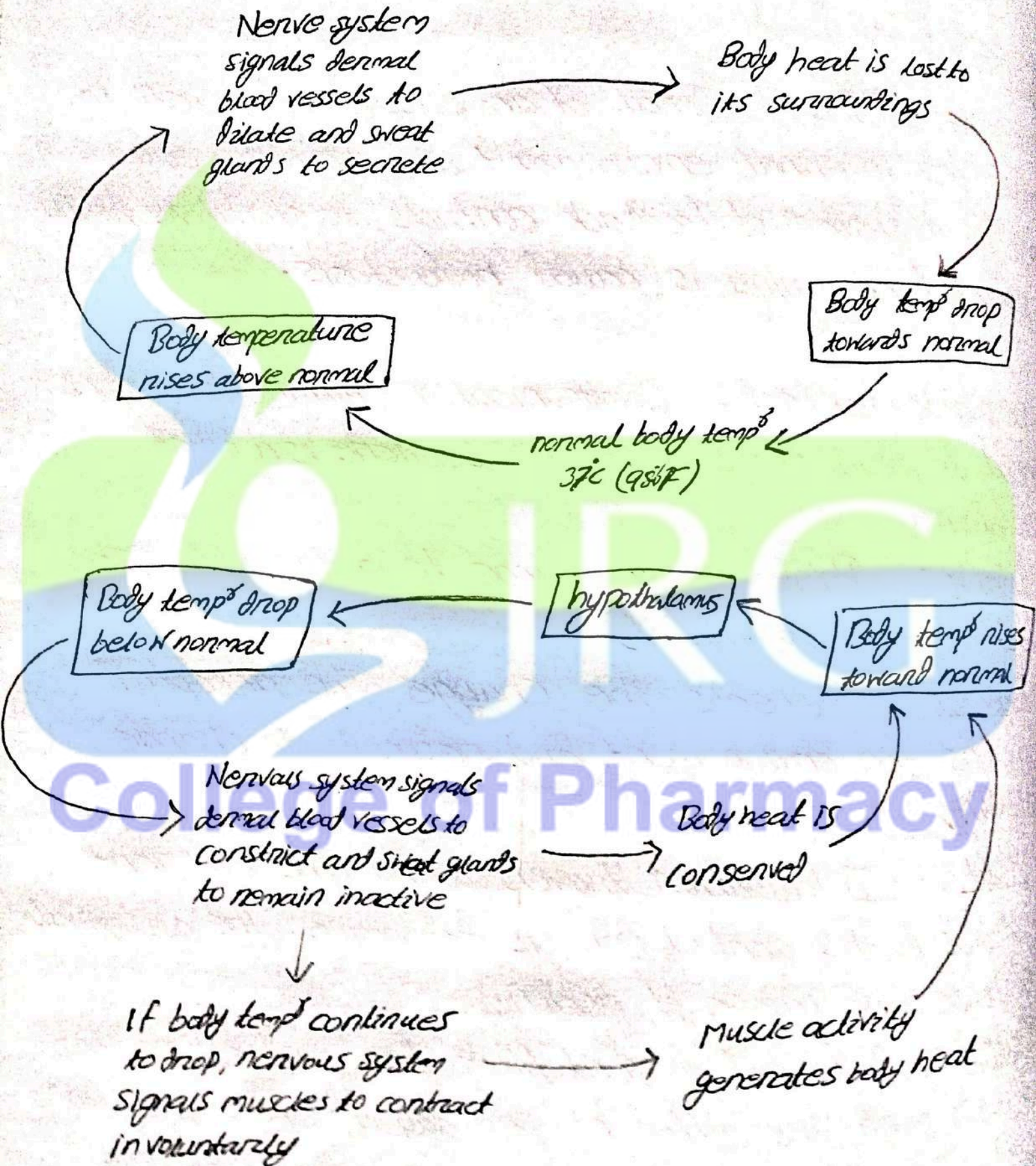
→ It also regulate fluid balance in the body.

→ It decrease the urine amount excreted and increase the water amount absorbed by the kidneys.

Feedback Mechanism :- The tendency of an organism or cell to regulate its internal environment and maintain equilibrium usually by a system of feedback controls to stabilize health and proper functioning is called homeostasis or feedback mechanism.

→ It is two types ① +ve Feedback Mechanism ② Negative feedback

# Negative Feedback Mechanism



6. Describe the respiratory system with neat and labeled diagram. Explain the mechanism and regulation of respiration.

A7 Respiratory system is a group of organs and tissues which help us in breathing or Respiration.

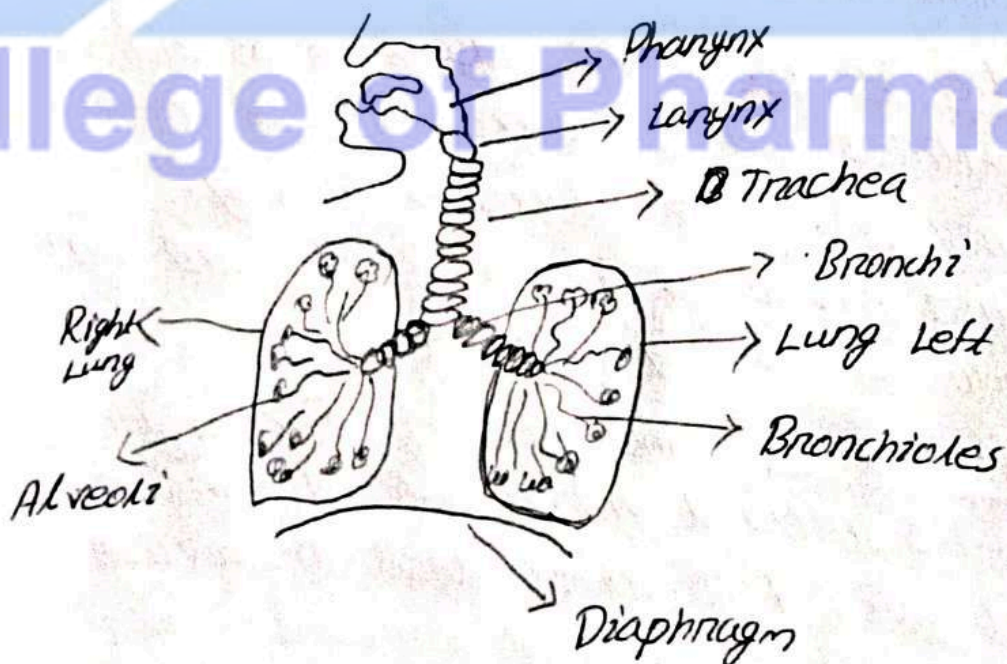
→ These group of organs / tissue are known as Respiratory tract which includes the passage of air from the nose to the alveoli in the lungs.

→ The Respiratory system consist of following organs

- Nose / Nasal cavity
  - Mouth / oral cavity
  - Pharynx
  - Larynx
- upper Respiratory tract

- Trachea
  - Bronchi
  - Bronchioles
  - Lungs & Alveoli
- Lower Respiratory Tract

→ Diaphragm → Costal muscle



## Mechanism of Respiration

It is the process of exchanging oxygen and carbon dioxide between the body and environment. It involves the coordination of multiple organs and system. Including the lungs, diaphragm, rib cage and nervous system.

→ It involves several steps

- (i) Inhalation / inspiration
- (ii) Exhalation / expiration
- (iii) Gaseous exchange

→ The average breathing Rate of an adult is 15-18 times per minute. up to 25 times.

## Regulation of Respiration

→ The average rate of respiration is about 13-28 per minute.

→ Regulated by Nervous system & chemical controlled & some factors.

→ Nervous system → Voluntary control  
- Automatic control

→ Chemical control → These are depends on the amount of  $CO_2$ , oxygen ( $O_2$ ) also on pH.

→ other factors :-  
• Exercise  
Emotions  
Altitudes  
Temperature