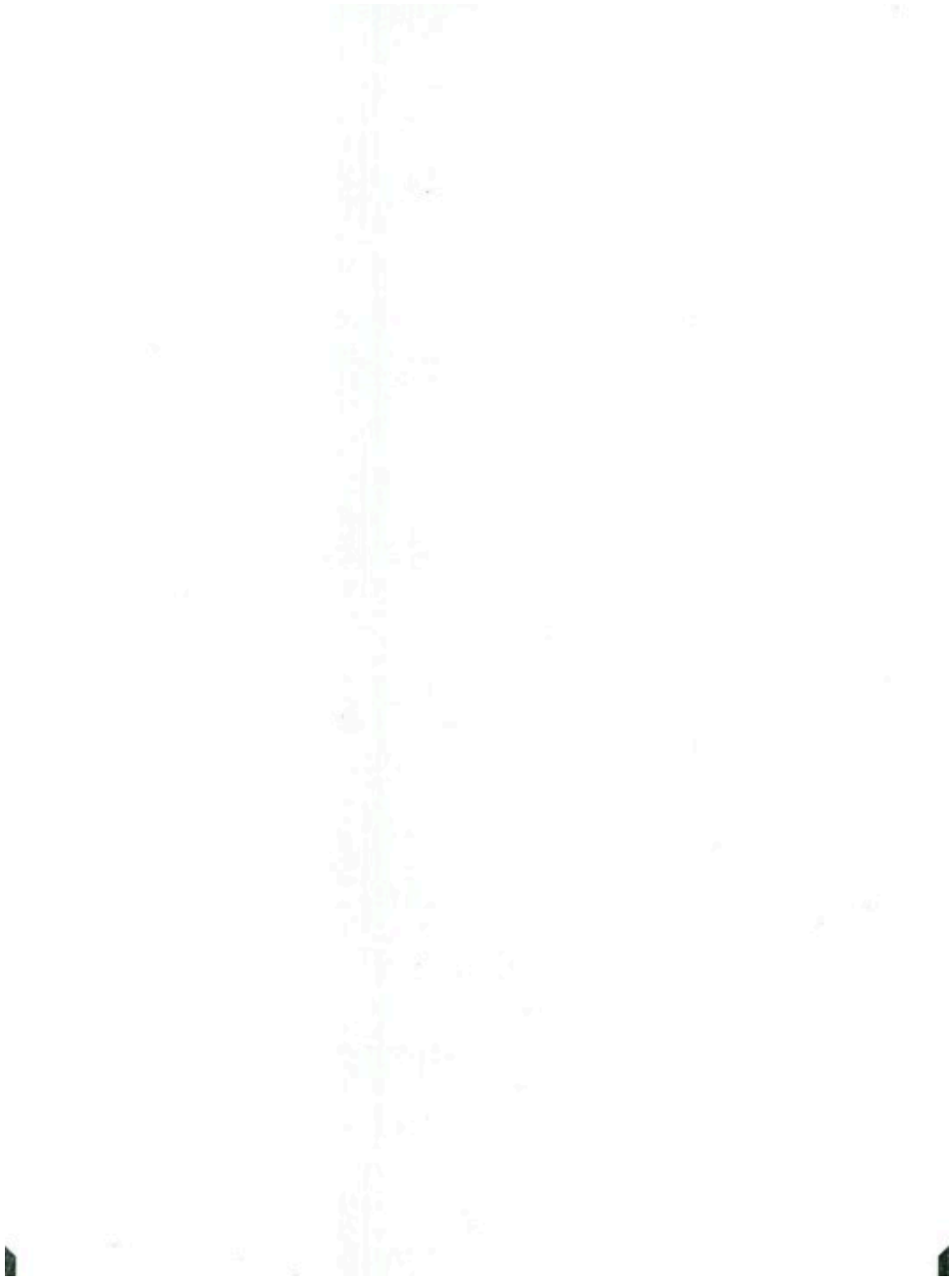
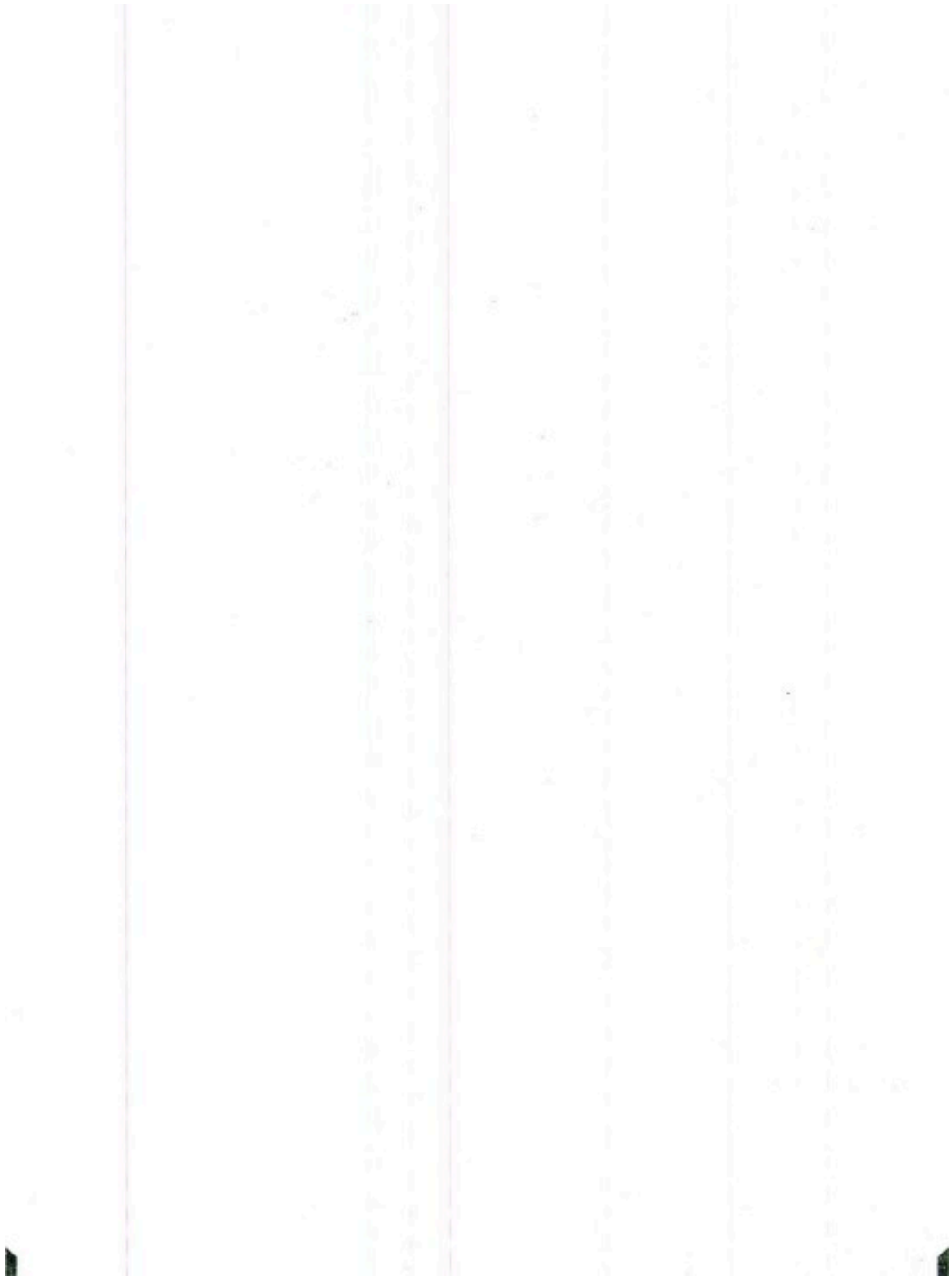






(Section B)

Q. No. 2 Part (i)

Glomerular Capillaries	Peritubular Capillaries
Function as filitration unit of kidney.	It filters waste from blood so waste leave body through urine.
Glomerular capillaries function ensure that essential plasma proteins are retained in blood and filtrate is passed on as urine.	Peritubular capallaries reabsorbs nutrients the body need to work properly i.e minerals.
Blood cells and protein pass through glomerular harmlessly.	Peritubular capillaries reabsorb minerals and nutrients along with excess H_2O.

Q. No. 2 Part (ii)

"VENTILATION"

PROFESS = "Exahalation"

MECHANISM:

- In exahalation, diaphgram relaxaes and attain it's dome shape.
- The external intercoastal muscles releaxes while the internal intercoastal muscles contracts.
- These movements decrease volume in the thoracic cavity while pressure increases in the lungs.
- The pressure inside lungs is greater that of atmospheric pressure.
- So, due to pressure difference air expels out of the alveoli.

(Section B)

Q. No. 2 Part (iii)

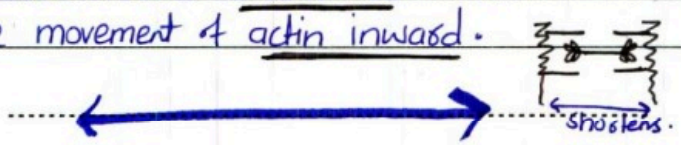
Role of Ca^{+2} ions in contraction:

The Ca^{+2} ions releases from the sarcoplasmic reticulum reaches the sarcomere and binds with the **TpC** of troponin. As a result of this binding tropomyosin moves and lead to the exposation of myosin binding site in actine filament which leads to formation of cross-bri

Sarcomere during contraction:

Sarcomere is the area between two "**Z-lines**". During contraction the length of sarcomere shortenes which lead to the movement of actin inward.





Q. No. 2 Part (iv)

Mean: The average of the data is called mean.

Data: 3, 6, 9, 12, 15, 18, 21

Mean: $\frac{\Sigma x}{n}$

Mean = 12

Median: The middle most value of the data is called as median.

Data: 3, 6, 9, (12), 15, 18, 21

Median: $\frac{n^{th}+1}{2} = \frac{7^{th}+1}{2} = 4^{th}$ position

Median = 12

(Section B)

Q. No. 2 Part (v)

Monoclonal Antibodies: These are the antibodies that are artificially coloned from a specific antibody against antigen in labs.

Advantages over conventional drugs:

High specificity: Monoclonal antibodies are highly specific as they are specifically synthesized against specific antigen. Target one antigen only.

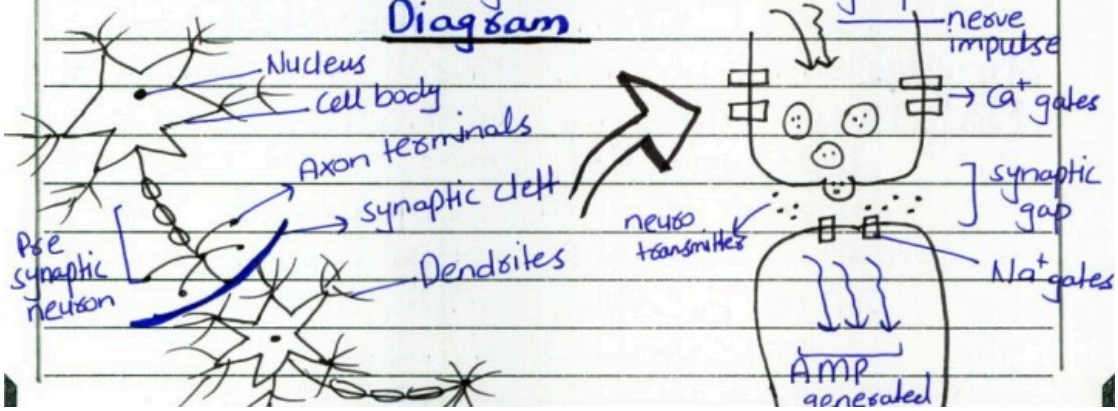
Therapatic: They are used in different gene therapies and diagnosis of diseases like cancer. Unlinke other conventional drugs they only target defected cell and don't effect healthy cells.

"SYNAPSE"

Q. No. 2 Part (vi)

The process in which axon-terminals of one neuron called **Pre synaptic neuron** fused with dendrites of another neuron called **Post synaptic neuron** in order to transfer nerve signal is called synapses.

Diagram



(Section B)

Q. No. 2 Part (vii)

Role of baroreceptors: Baroreceptors are the mechanoreceptors present in the walls of "high-pressure zones" like carotid sinus and aorta walls. When **blood pressure increases** these receptors stretch and generate a signal toward the symphatic nervous system which **increase heartbeat & vasodilation** to bring normal pres

Role of volume receptors: Volume receptors are present in "low-pressure zones" like walls of atria and pulmonary artery. If the blood volume drops than normal these receptors stretch and signal to brain which releases **ADH** to increase water reabsorption.

Q. No. 2 Part (viii)

Nerve Impulse: It is an "electro-chemical" signal which transmits information from one part of the body to the other parts.

Generation of Impulse: Nerve impulse is generated when a **Threshe hold stimulus** arise which causes the **Influx of Na^+ ions** entearance of Na^+ ions causes the **depolarization** (more negative outside and more positive inside) this depolarized state of cell causes the transmission from one point to other and generate the electrochemical signal.

(Section B)

Q. No. 2 Part (ix)

HORMONES SECREATED BY ANTERIOR PITUITARY

Following are the hormones secreated by anterior pituitary:

- Somatotrophin Hormone or Growth Hormone (GH)
- Thyroid stimulating Hormone (TSH)
- Adrinocastico trophic Hormone (ACTH)
- Follicle stimulating Hormone (FSH)
- Luterizing Hormone (LH)
- Prolactin Hormone (PH)

Q. No. 2 Part (x)

HARMFUL EFFECTS OF OCEAN ACIDIFICATION

Chosal bleeching: Ocean acidification and high temperature causes the algae "zooxanthela" to migrate which lives in symbiotic relation with coral leafs causing to bleeching of corals.

Loss of Habitat: High pH of ocean affects the life processes of marine organisms which migratets to other places causing extinct of some species.

Food chain distisbance: Increased acidity causes the death and migration of many species which cause distirbance in food chain and effect whole ecosystem.

(Section B)

Q. No. 2 Part (xi)

"Selective Reabsorption"

It is one of the main step of the urine formation in which important things like Glucose, vitamins, amino acid, water are re-absorbed which were filtare due to the pressure filtration.

- 99% of reabsorption occurs in **PCT proximal convulated tubule.**
- Water reabsorption takes place in **LOH descending limb.**
- Salts and minerals reabsorption take place in the **ascending limb of LOH.**
- Water reabsorption also take place in **Collecting Duct.**

Q. No. 2 Part (xii)

"ROLE OF LIVER"

Excess glucose storage: Lives convests excess glucose into glycogen and store it for the later use of energy.

Synthesis of blood plasma proteins: Lives systheses certain blood plasma protein for example: serum albumin, globlins, fibrinogen

Bile manufacturing: Lives produce bile which is used for the emulsification of fats.

Clearence of blood toxins: Lives remove all toxic substance from the blood and convert toxic ammonia into urea.

(Section B)

Q. No. 2 Part (xiii)

Homologus Structures	Analogous Structures
→ Homologus structures are the structures of species having same structure and same functions.	→ Analogous structures are the structures of species having different structure but same functions.
→ Due to having same common ancestors.	→ Due to having different ancestors.
→ Forelimbs and hindlimb of fishes and humans.	→ Wings of butterfly and wings of bat.

Q. No. 2 Part (xiv) **"Mechanism For Heat Loss"**

Following are the mechanism for heat loss.

Sweating: Sweat glands in skin produce sweat. Evaporation of sweat requires large amount of energy so in this way body loses it's maximum heat and sweating causes cooling effect which maintain normal tempera

Vasodilation: In vasodilation capillaries near to skin dilate leading to increase in the diameter which causes more blood to flow through radiation excess heat moves from blood to external environment.

(Section C)

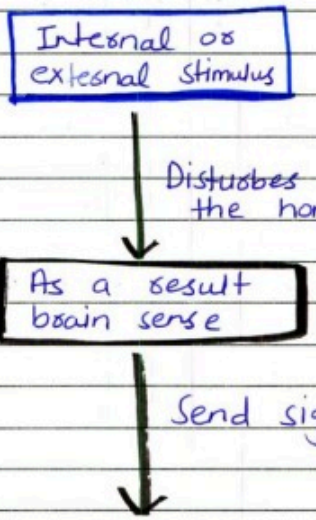
Q. No. 3 (Page 1)

"Negative Feedback Mechanism"

→ It is the type of feedback mechanism in which "increase of one substance causes decrease of other substance".

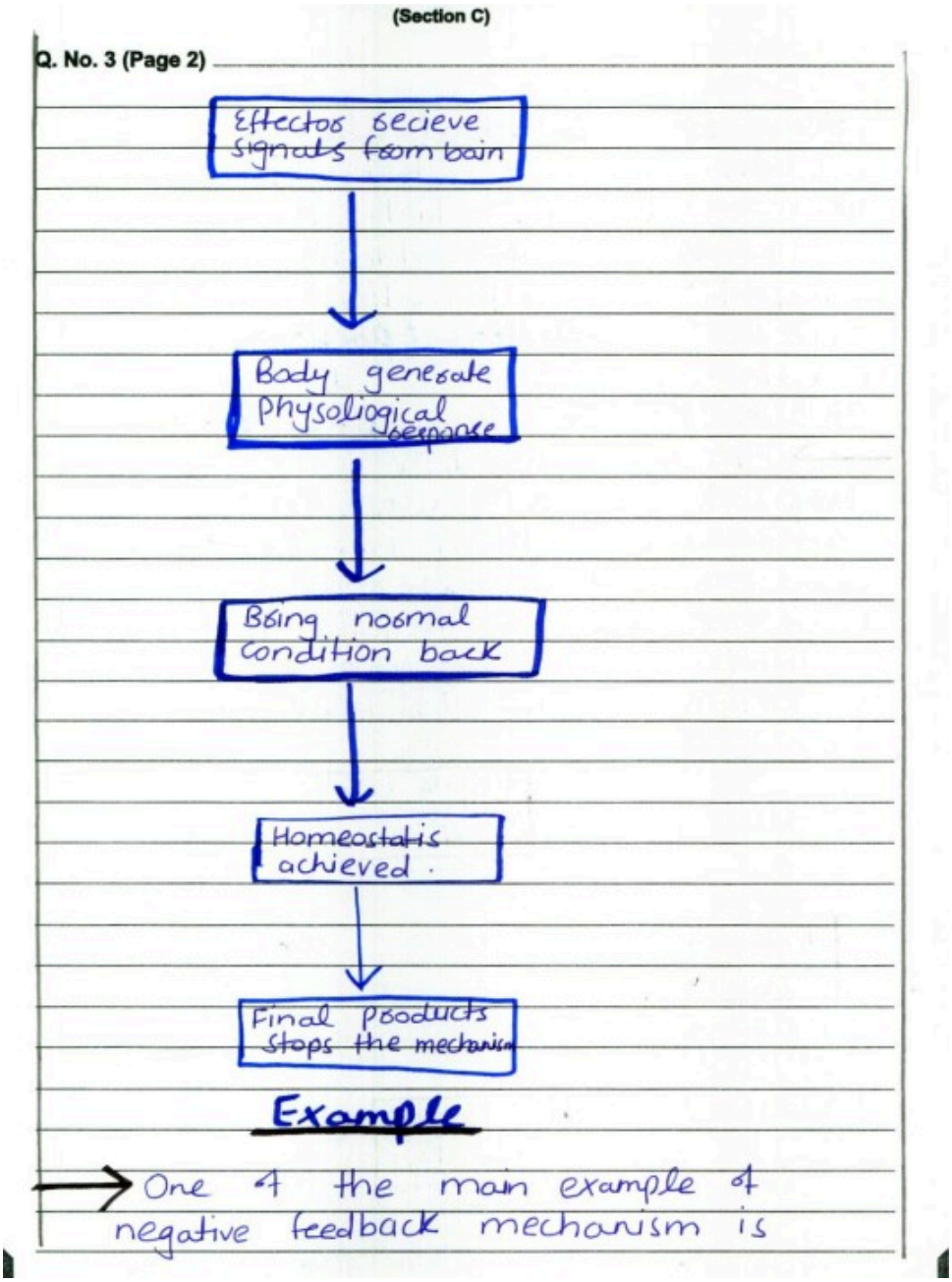
→ Negative feedback mechanism is used to maintane "Homostatis" and maintains internal conditions by "different physiological responses".

"Mechanism of Negative Feed back"



(Section C)

Q. No. 3 (Page 2)



Example

→ One of the main example of negative feedback mechanism is

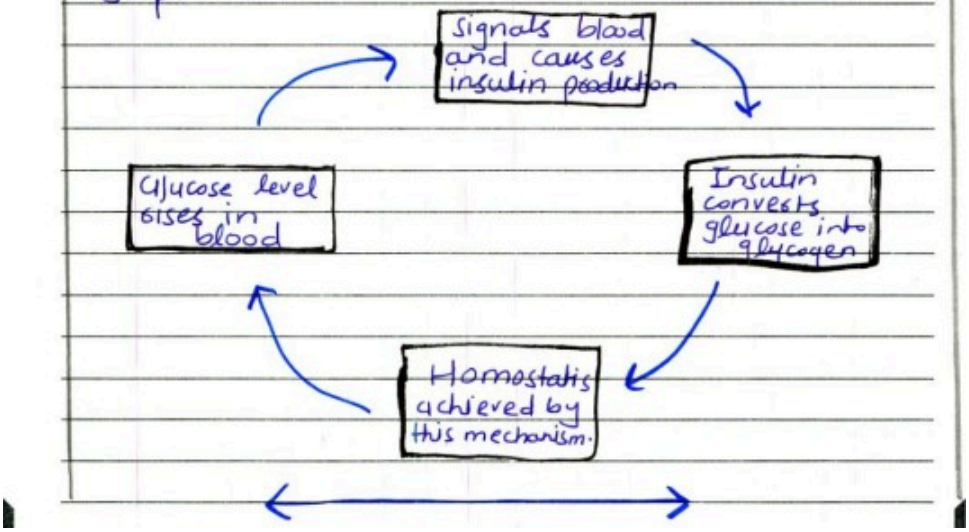
(Section C)

Q. No. 3 (Page 3)

Regulation of blood glucose level.

When glucose contration **increases** in blood stream which is detected by the **brain** after detection **CNS** intercept the information and send signals to **effectors (pancrease gland)** which leads to secretion of **Insulin hormone** from **β-cells**.

→ Insulin secretion causes the **trap of excess glucose molecules** and convert them into **glycogen** and store it in liver for future use in this way negative feedback maintains the balance and further production of insulin from pancrease stop.



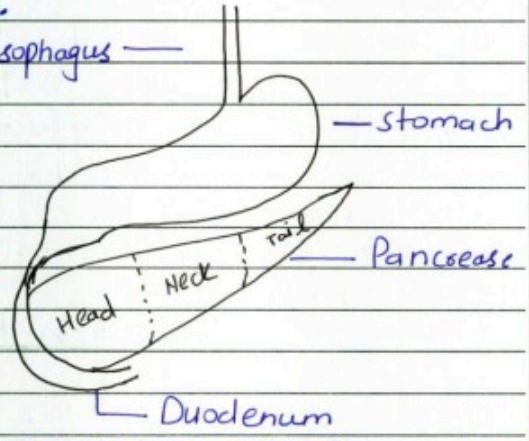
(Section C)

Q. No. 4 (Page 1)

"PANCREAS"

It is one of the most important organ of human body. It is a "Heterocrine gland" which means act as both **endocrine** and **exocrine** gland.

LOCATION: Pancreas are located "Inferoris" to stomach in **C-curvature** of **duodenum.**



Structure:
Pancreas is divided into three parts: Head, Neck, Tail.

"ENDOCRINE GLAND ROLE"

Pancreas "Islet's of Langherhens" perform the rule of endocrine gland.

ISLET OF LANGHERHEN: It has two types of cell **α-cells** and **β-cells.**

(Section C)

Q. No. 4 (Page 2)

HORMONES OF PANCREAS: Pancreas secreate two hormones for the regulation of blood glucose level. The hormones secreated are:

Insulin from Beta cells

Glucagon from alpha cells

"Insulin Role:"

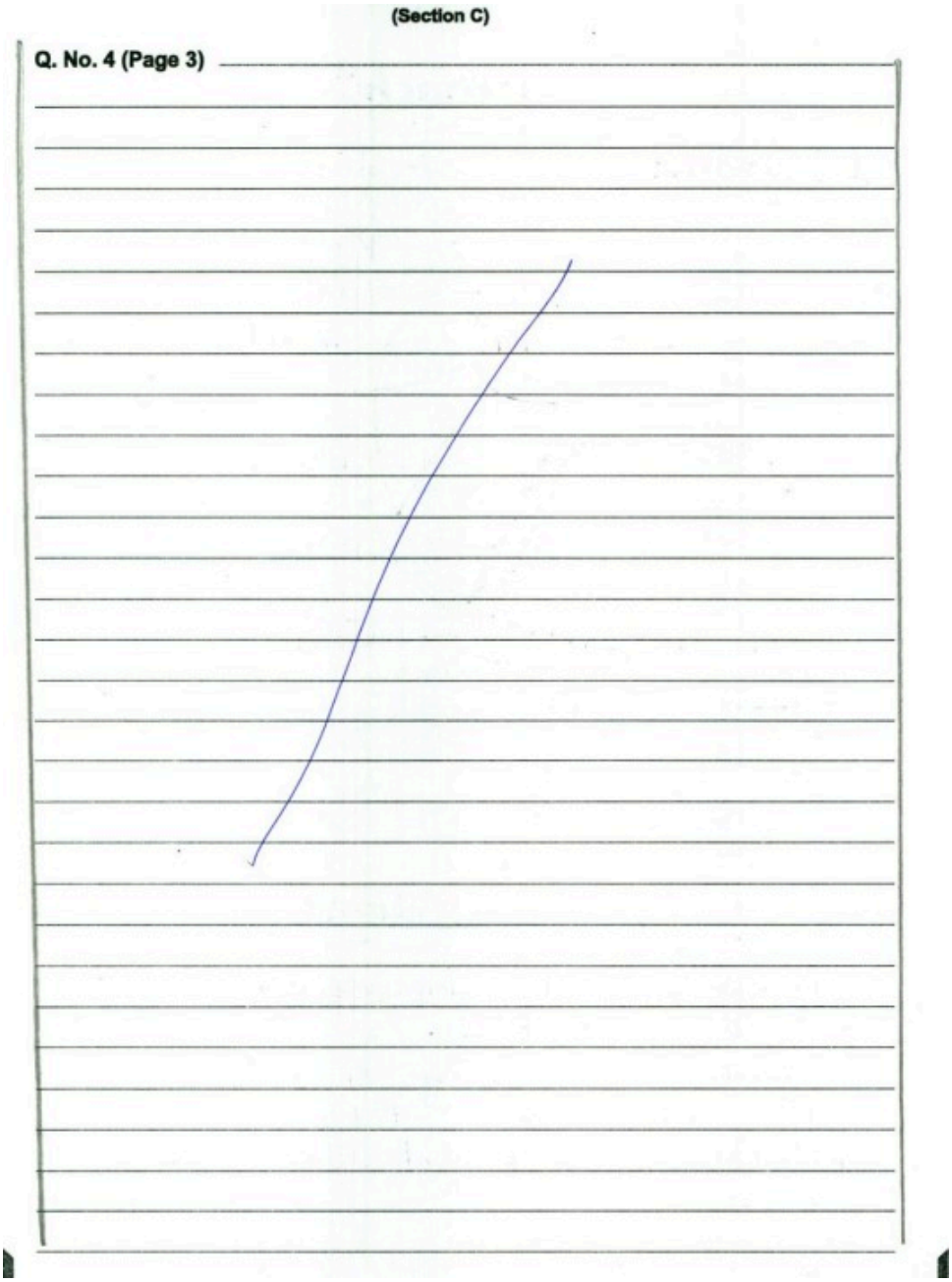
When glucose level in blood increases the signal sent to the brain which causes the release of Insulin hormone which traps excess glucose molecules and convert them in glycogen and store in livers for future use. In this way blood glucose level drops to normal.

"Glucagon Role"

When glucose level in blood drops than normal the brain send signals to pancrease which causes glucagon hormone to release in blood. It acts on livers and convert glycogen into glucose and sometimes stored fats and proteins into glucose. In this way blood sugar rises to normal.

(Section C)

Q. No. 4 (Page 3)

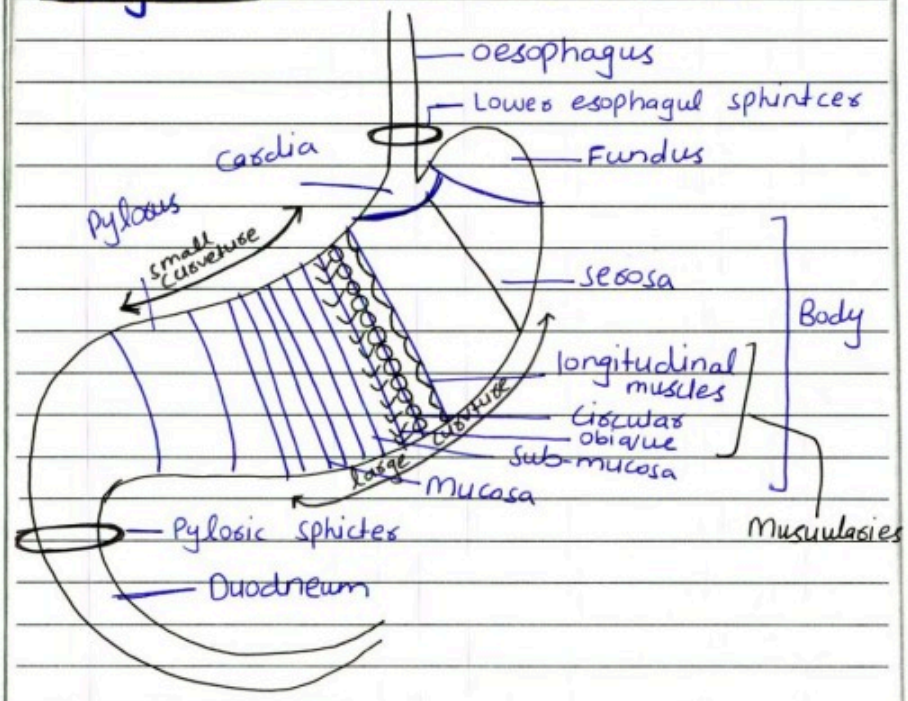


(Section C)

Q. No. 5 (Page 1)

"Stomach"

Diagram: It is a J- shaped organ.



"Chemical digestion"

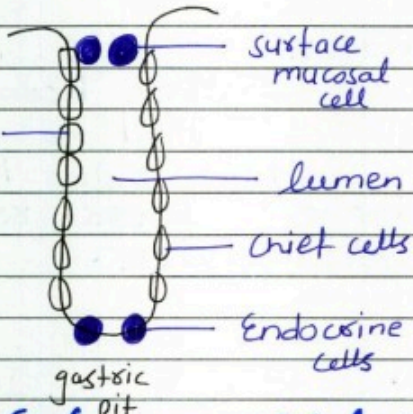
Chemical digestion involves various enzymetic secreations.
Stomach has lining of epithelial cells these are 4 types of epithelial cells present in stomach.

(Section C)

Q. No. 5 (Page 2)

"Types of cells"

- Surface mucosal cell
- Parietal cells
- Zygomenic / Chief cells
- Endocrine cells.



In stomach **Surface mucosal cells** secrete mucus which covers entire stomach lining and protect from the digestion of stomach cells. **Parietal cells** release **HCl and intrinsic factor**. Hydrochloric acid released kill the bacterias present in ingested food moreover it makes the environment acidic which causes **activation of pepsin** further the intrinsic factor like **glycoprotein binds with vit B_{12}** for its absorption.

(Section C)

Q. No. 5 (Page 3)

The chief cells secreats pepsinogen which is in its inactive form and is activated by HCl. Pepsin digest proteins into peptides. Protein digestion begin in stomach.

Endocrine cells in stomach releases "gastrin hormone" when food is about to reach stomach or is already present. Gastrin hormone causes release of gastric juices.

(Section C)

Q. No. 6 (Page 1)

"Ammoniotelic"

Defination: Animals who excreated theis nitrogeneous waste in foorm of ammonia are called ammoniotelic.

Nitrogenous waste: Theis waste is ammonia which is highly toxic and highly soluble in water.

Removal: NH_3 can be removed foom body by water. 1g of nitrogen in ammonia requires 500ml of water.

Example of animals: Animals living in fresh water have the availibility of such huge amount of water. Fishes, aquatic animals are ammoniotelic.

"Ureotelic"

Defination: All those animals who excreated their nitrogeneous waste in foorm of urea are called ureotelic.

Nitrogenous waste: Theis waste is urea which is 100,000 times less toxic than ammonia.

(Section C)

Q. No. 6 (Page 2)

Removal: Urea can be removed by body through water. 1 g of nitrogen in urea requires 50ml of water.

Examples of animals: Animals living in freshwater and some terrestrial organisms like amphibians & sharks are ureotelic.

"Uricotelic"

Defination: All those animals who excreated their nitrogenous waste in form of uric acid are called uriotelic.

Nitrogenous waste: Their waste is in form of uric acid which is least toxic.

Removal: Uric acid is also removed by water. 1g of nitrogen in form of uric acid requires 1ml of water.

Examples of animals:

All terristial animals including reptails (lizards, snacks) and egg lying like mammals and birds are uricotelic.

(Section C)

Q. No. 6 (Page 3)

