Q. No. 2 (i)

→ **Structure :-**

larynx is situated below pharynx and above trachea. It is present in neck region. It is a voice box that is made up of hyaline cartilage and it has two pairs of vocal chords.

→ **Function :-**

Air passageway after pharynx is from larynx. When air passes through larynx the vocal chords vibrate and also produce sensation of sound. After larynx air passes to trachea (windpipe).

Q. No. 2 (ii)

(A) it is hyaline cartilage.

(B)

Hyaline cartilage is a very strong yet flexible soft connective tissue. It consists of collagen fibres and also some elastic fibres. It is usually found in trachea, larynx, bronchi etc.

Q. No. 2 (iii)

→ **Renal Tubule :-**

In the renal tubule of the nephron, selective reabsorption takes place. It has 3 parts.

1 Proximal Convoluted Tubule In which there is reabsorption of most water and salts back in blood decreasing amount of filtrate

2. LOOP OF HENLE

- **Descending limb :-** Reabsorption of water in blood (capillaries) occurs
- **Ascending limb :-** Reabsorption of salts in blood (capillaries) occurs.

3 Proximal convoluted tubule :- More Reabsorption occurs of water in blood capillaries surrounding tubule. This reduces glomerular filtrate to 1%, 99% is reabsorbed

.....

Q. No. 2 (iv)

Hormone	Gland
A) Parathormone	parathyroid glands
B) Corticosteroids	adrenal glands from adrenal cortex
C) Glucagon	Ductless part of pancreas

Q. No. 2 (v)

-a-

(A) Schlera

(B) Pupil

-b-

C is retina, In retina image is formed. It is used to make a focused image. It generates optic nerves when light hits retinas which has **rods** and **cons**. Rods are sensitive to dim light and cons are sensitive to bright light. It has 2 areas fovea it is a dip and it is responsible for sharpness of vision optic disc also called as blind spot. When retina rods and cons generate nerve impulses it is transmitted to brain through optic nerve by optic disc. This forms vision.

.....

Q. No. 2 (vi)

Female Gametophyte Generation :-

Some mother cells in the ovule undergo ~~mitosis~~ meqsis to form ~~diploid~~ haploid macrospores (n) which then undergo mitosis and form female gametophyte and inside the femal gametophyte, the haploid macrospores divide by mitosis and forms two cells, "egg cells" and "fusion nucleus". These are the gametes formed by the gametophyte generation. of femal reproductive part of flower. It is also called as ~~stamet~~ **carpel** and it consists of a sticky stigma, middle style, basal ovary and ovules. The seems deposit in ovule for fertilization by means of

Q. No. 2 (vii)

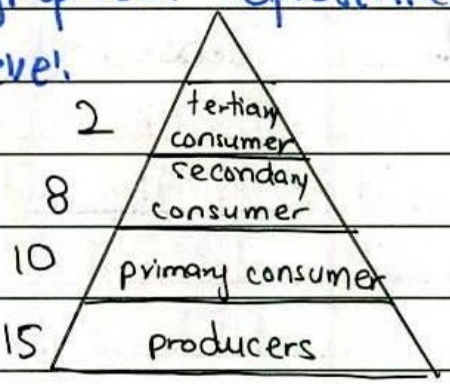
- **Ecological pyramids:-** Were Introduced by John Elton.

An ecological pyramid is the graphical representation of the number of organisms, biomass and energy available in a unit area at various trophical levels.

- **Number Pyramid:-**

There are 3 types of ecological pyramids in which one is by number pyramid. It is the graphical representation of no of organisms living per trophic level.

In pyramid by numbers, the number of organisms in smaller trophical level and there are small number of organisms present in the high trophic level.



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Q. No. 2 (viii)

-(a)- Binary fission (division in to two) ~~of a unicellular eukaryote~~.

-(b)-

- At B stage the nucleus of parent cell divides and moves to the two opposite poles. It is "**karyokinesis**"

- At C stage, division of the cytoplasm occurs called as **cytokinesis**. The cell wall also invaginates. By division of cytoplasm parent cell is now divided in to two daughter cells that grow again and reproduce.

Q. No. 2 (ix)

(a)

It is the combination/type of genotype in which the gene pair consists of 2 different alleles (alternating alleles) i.e. (Aa). In this type one allele is dominant (A) and the other allele is recessive (a) in nature. (If we consider that A is allele of pigmentation and a produces no pigments for example)

(b)

The specific combination of genes in an organisms is called as genotype. It has 2 types.

- heterozygous (Aa)
- homozygous (AA or aa)

.....

Q. No. 2 (x)

Drugs	Effects
a) Sedatives	sedation, laziness, depression, lethargy, suicidal thoughts
b) Hallucinogens	Hallucinations, feelings of well being
c) Heroin	Drowsiness, Addiction

Q. No. 2 (xi)

Transcription	Translation:-
• In this process the specific gene of DNA is copied inform of messangar (RNA) · mRNA	• In this process, the ribosome reads the specific sequence of RNA and join certain amino groups to form protein.
• It is independant of translation.	• It is dependant on transcription.
• It is the 1st step, it proceeds before translation.	• It proceeds after transcription.

.....

Q. No. 2 (xii)

• **CONTINUOUS VARIATION:-**

The variation showing wide ranges of phenotypes are "continuous variation". It has a wide and abundant types of phenotype from one extreme to other.

Example:- **Height, feet size, weight etc**

It depends on environmental factors and it is controlled by more than one gene pair.

• **TRANSLATION EXAMPLE:-**

When the mRNA meets the ribosome, ribosomes reads the sequence and forms particular amino acids to form

Q. No. 2 (xiii)

→ **Genetic Engineering :-**

Genetic engineering or recombinent DNA technology is defined as the artificial synthesis, modification, addition, removal of the genetic material DNA. It started in early 1940's.

→ **Use of Microorganisms :-**

Microorganisms have ability to divide rapidly so they prove to be effective in making many copies of the required gene. They also are a pollution free process and produce high yield.

- **Example :-** Synthesis of insulin from rapid division of GMO E. Coli in which human insulin gene was added.

.....

Q. No. 2 (xiv) **Predation :-**

It is relationship between members of different species. The relationship in a food chain is **predation**. In a food chains organisms prey on producers and these act as prey for predators similady these predators are preyed about by predators 2 (secondary consumers) etc.

→ **FOOD CHAIN :-**

A food chain is a series in an ecosystem in which one organisms feed on another organism before being fed by another organism (predator) e.g

Grass →	Grass hopper →	Frog →	Snake →	Eagle
(producer)	(herbivore)	(carnivore)	(secondary)	(tertiary

Q. No. 2 (xv)

Joints are the location where two or more bones meet.

→ **Moveable Joints**:- These are the joints that allow movement. These are of 2 types.

(i) Ball and Socket Joints

These joints allow movement in all directions instead of movements in the same plane. These include. "hip joints" & "shoulder joints"

(ii) Hinge joints:

These joints allow movement in one/single plan only i.e back and forth or up and down. But not all directions. They act just like hinge of door i.e Knee joints Elbow joints

Q. No. 3 (Page 1/4)

-a-

(i) Alveoli (singular :- alveolus).

(ii) Alveoli are sacs like structures that allow gaseous exchange. There are many alveoli and they collectively constitute lungs. Air passageways inhalation ends at alveoli and they are formed by the alveolar ducts that are narrow continuation of bronchi and bronchioles. They consists of a single layer of cells and have blood capillaries around them. They are formed when the bronchi narrow into bronchioles to alveolar ducts that open to alveoli. Singular of alveoli is called **alveolus.** The air passageway is given below

Nasal cavity — Pharynx — larynx — Trachea - Bronchi - Bronchioles — Alveolar ducts - alveoli.

(iii)

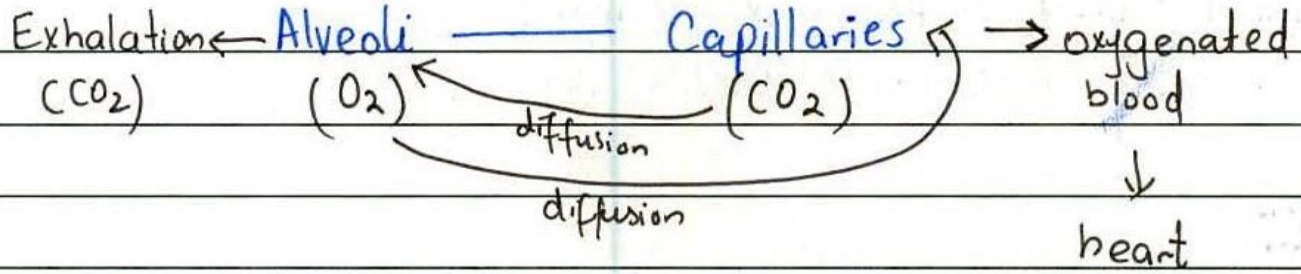
Structure :-

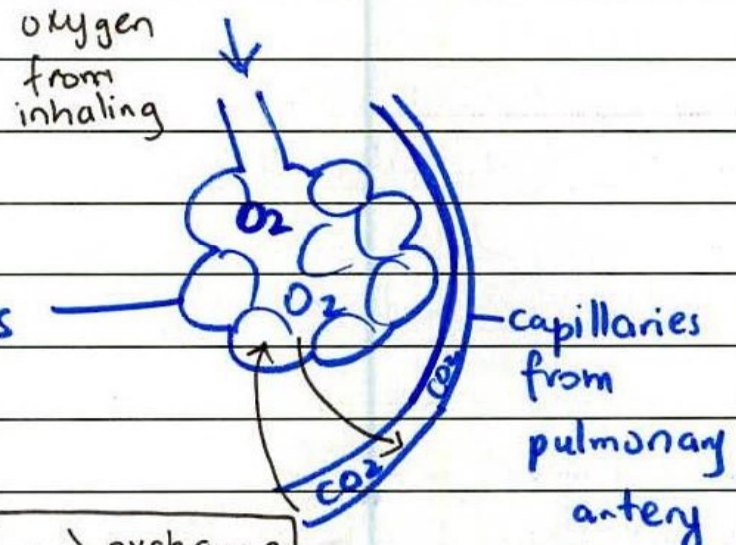
Alveoli are sac like structures, they are constituted of single unit called as alveolus. Alveolus consists of single layers of epithelial cells. They are also surrounded by thin blood capillaries that allow gaseous exchange.

Function :-

Alveoli are responsible for "gaseous exchange". During

that reach the alveoli and on the contrary the pulmonary artery carries deoxygenated blood. This is pumped by heart to lungs, from here the arteries branch to **arterioles** and **capillaries** surrounded the alveoli. Here the inhaled oxygen and the carbondioxide are diffused the oxygen diffuses from the alveoli to the capillaries whereas as carbondioxide from the deoxygenated blood in capillaries diffuse to alveoli, where they are removed by exhalation. The oxygen in blood capillaries makes the blood oxygenated and capillaries join to form venules and then the pulmonary vein which carries oxygenated blood back to heart and it is pumped to body parts. The CO_2 produced in blood is due to **cellular respiration** in our cells.





(b)

→ NITROGEN FIXATION :-

Nitrogen fixation means the conversion of gaseous atmospheric nitrogen to "nitrates". It occurs because producers like plants cannot obtain nitrogen directly it has to be chainged in to nitrates to form required proteins.

There are **3 types** of nitrogen fixation.

1. Atmospheric Nitrogen Fixation :-

In this type of fixation, the gaseous nitrogen in the atmosphere is fixed during **thunderstorms** & lightenings. Here the nitrogen converts to nitrogen **oxides** and then these dissolve in rainwater to form **nitrous and nitric acid**. These then fall on earth land and react with the salts to form **nitrates**.

Nitrogen → Nitrogen oxides → Nitric acid → Nitrates

2. Biological nitrogen fixation :-

In this type of nitrogen fixation, the nitrogen gas is converted into nitrates by use of nitrogen-fixing bacteria. These directly converts N_2 gas to **nitrates** and these bacteria can either be **symbiotic** (Rhizobium) etc or **free living** (Nitrobacter, Nitrosomonas).

3. Industrial nitrogen fixation:

In industrial nitrogen fixation the nitrogen gas is reacted with **hydrogen gas** at high pressure and temperature and it produces **ammonium nitrate** which is reduced to form **ammonia** which then by nitrification by Nitrosomonas bacteria forms **nitrates**. These are used as fertilizers.

Nitrogen + Hydrogen → Ammonium nitrate → Ammonia ↓ Nitrates

(a)

Bone :-

Bone is a dense connective tissue. It is hard and articulated structure that forms the **skeletal system** along with cartilage, tendons, joints & ligaments. It contains of abundant number of collagen fibres.

Structure :-

Bones have the following characteristics

- Dense and very hard structure
- It contains 2 regions (**compact bone & soft bone**)
- It produces red blood cells & white blood cells
- It stores minerals like calcium and phosphate
- It has nerves in it and it is made of living cells, It contains bone marrows.
- It has many cells, the mature cells are called as **osteocytes**.
- They provide protection, support and movement.

Layers / Regions :-

Bones have 2 regions

(i) Outer region called compact bone.
(ii) Inner regions called spongey bone.

• Outer Region :-

It is really hard and it forms the outer region of the bone along with this it consists of sturdy connective tissue. This provides mechanical support and protection.

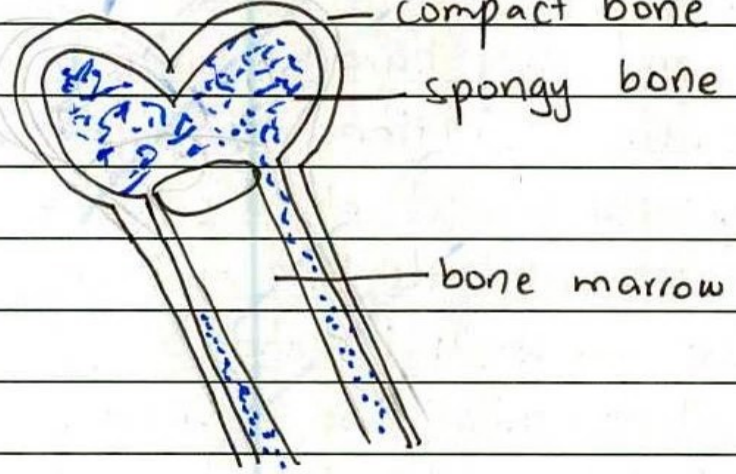
- **Inner Region:-**

The inner region consists of soft and porous surface. This area is called as **spongy bone**

- **Bone Marrow:-**

There is bone marrow present in the inner bone and it produces blood cells i.e red blood cells and white blood cells.

- **Figure:-**



^ BONE

(b)

- **Fermentation:-**

It is a process of incomplete oxidation ~~of~~ reduction of glucose. It is a microbial process. In biotechnology terminology it means.

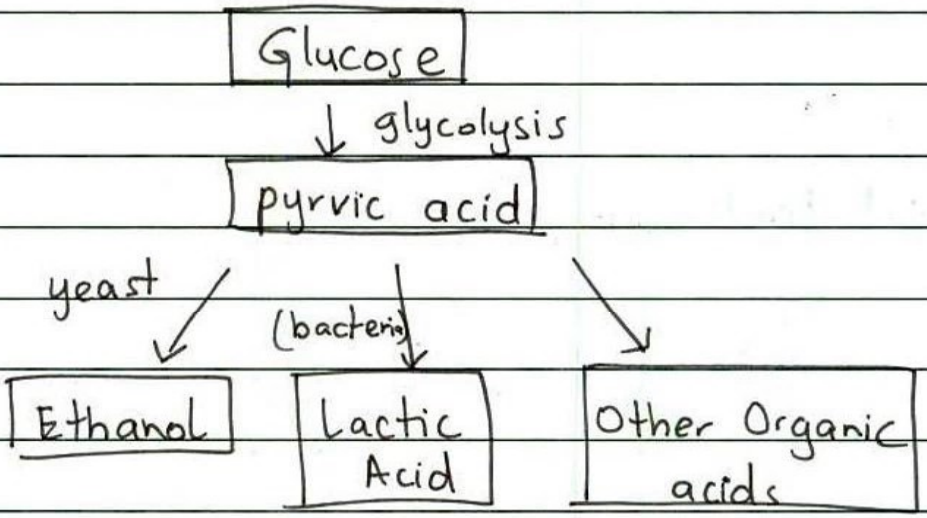
"Production of large amounts of products by mass culture of microorganisms"

too.

(i) Alcoholic fermentation by **yeast**

(ii) Lactic Acid fermentation by **bacteria**

These are followed by carbohydrate fermentation in which glucose molecule breakes done to two moleaules of **pyrvic acid**. After this it is proceeded by different microorganisms that form desired products.



• Fermented foods:-

• Breads

Breads are produced by alcoholic fermentation by S. cerivisiae (a yeast). The CO_2 produced by breaking down of pyrvic acid forms CO_2 and ethanol.

• Daiy Products

Dairy products like yogurt and cheese are produced

the coagulation of the milk protein causes yogurt to form. Cheese is formed when ~~its~~ the milk protein undergoes lactic acid fermentation and forms cheese. It is also done for souring milk.

• Beverage Products:-

Beer is obtained by malting, crushing, grinding cereals. They undergo alcoholic fermentation by Saccharomyces cerevisiae and it then greates acetaldehyde from the pyruvic acid and then it converts into ethanol.

Wine is obtained by alcoholic fermentation of yeasts.

→ Industrial Products:-

Product	Microorganism	Uses
Formic acid	Aspergillis	electroplating
Ethanol	Saccharomyces	beverage + vinegar ↑ production
Glycol	Saccharomyces	drugs and dye synthesis.
Acrylic acid	Bascillus	plastic synthesis

→ Advantages of Fermentation:-

Advantages of fermented food.

- more nutritious
- more tastier
- great perservator
- does not spoil instantly

Fermenter:-

Fermentation is also carried in fermenters at industrial

(a)

- **Reflex action and Reflex arc:-**

The quick and involuntary actions that are produced are called as "reflex ~~action~~ arc" and they are not fully reached to brain to produce voluntary response. The pathway taken by the nerve impulse ~~from~~ to produce reflex arc is called as **'reflex action'**. Spinal cord acts as a coordinator in involuntary actions.

- **Example:-**

Withdrawal of hand from hot object

1. Sensory Impulses:-

When we bring our fingers close to ~~our~~ any (stimulus) nearby hot object i-e candle burning. The heat stimulates the pain and temperature receptors which activate sensory neurons and a sensory nerve impulse is formed.

2. Interneurons & Motor Pathway:-

These nerve impulse that are carried by the sensory neurons enter the "interneurons" at the spinal cord the interneurons generate and transmit nerve impulses to motor neurons. The spinal cord sends information in form of nerve impulses.

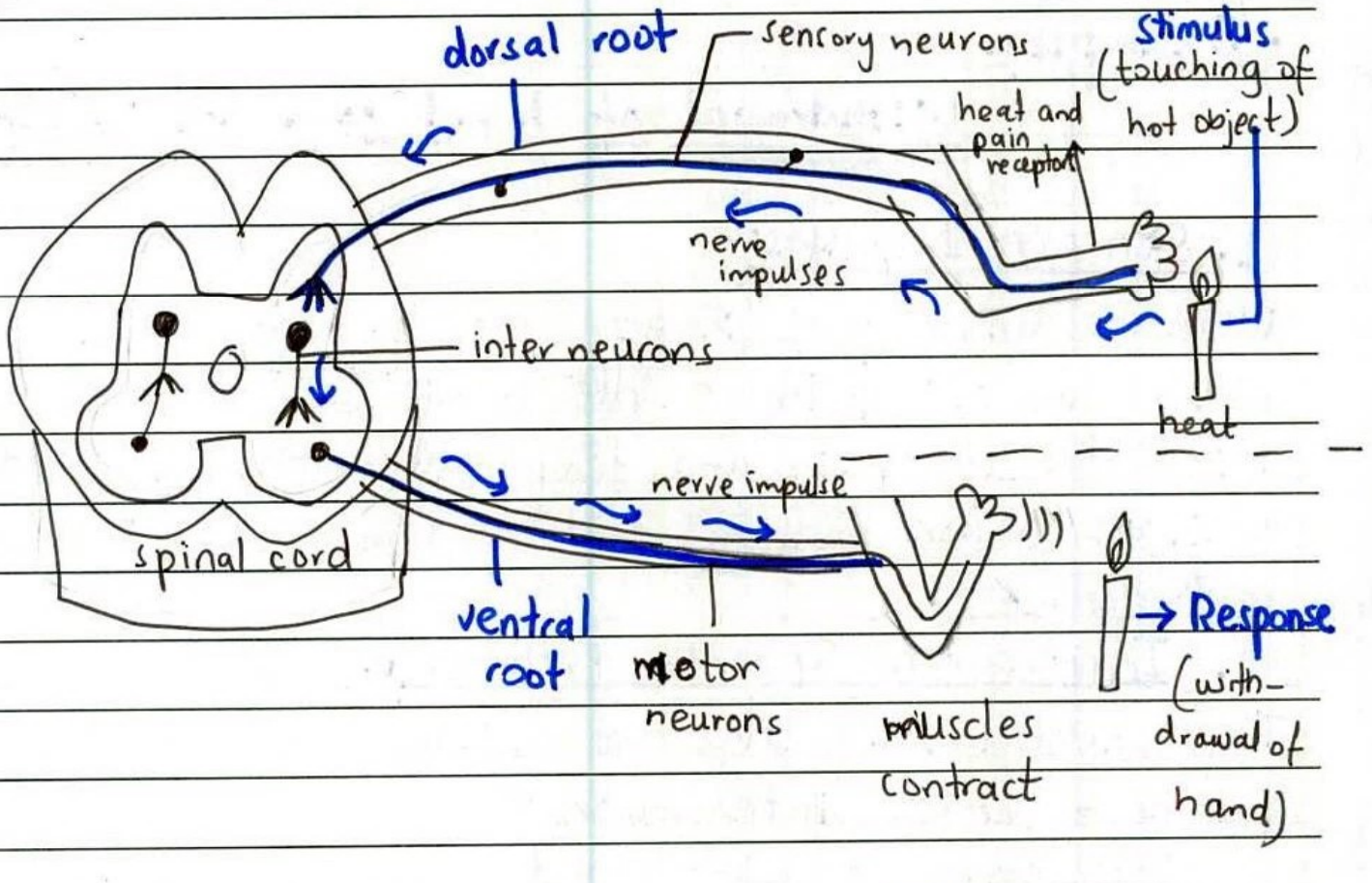
3. Response:-

On reaching the motor neurons, the nerve impulse are

travel and reach our arm muscles (effectors) which results in a response which is withdrawal of hand.

Hence, this is how reflex action works. ~~There motor neuron~~ It produces involuntary actions and after millisecords the impulse in transmitted to Brain so we become aware of what happened.

• **Figure :-**



(b) —

(b) **Vegetative Propagation :-** It is production of a new plant from the vegetative parts i.e (stem, leaves) from parent plant.

Artificial Vegetagive Propagation

It is the production of plants artificially. The two types are.

i- Grafting :-

In this process a stem of the parent plant is cut and attached to the plant having an already established root system of the same species.

→ **Method :-**

The vasular bundles of both plants after some time join togather, then both grow togather into a new plant that is genetically identical.

→ **Example :.**

Grapevines, Plum trees, Peach trees and Roses are produced this way.

→ **Advantages :.** Plants with desirable characteristics are used and it forms plants with beneficial factors

ii- Cuttings :-

In this process cutting is taken from either the stems or leaves of a plant and applied and dug inside soil.

→ **Method :-**

The cuttings must be taken from the merismatic regions i.e where growth can occur so a new plant is produced. The cutting is applied to a soil with given conditions (sunlight, water, temperature, nutrients, light) etc. After some

and ultimately a new plant. This way a genetically identical daughter plant is produced.

→ **Example:-**

"Roses", "Ivy" and "Grapevines" are reproduced by ~~stem~~ method of cuttings.

Diagrams:-