Q. No. 2 (i) **LARYNX:**

STRUCTURE: Larynx is a box made of cartilage, also known as voicebox

LOCATION: It is present between the pharynx and trachea.

FUNCTION: Two pairs of fibrous bands, called the vocal chords are stretched across the larynx. The vocal chords vibrate when air passes through it. This vibration produces sound. The movement of tongue, cheeks, lips, jaws and the vibration of vocal chords together result in speech. Speech is an ability gifted to humans, and has put humans superior to all.

FURTHER DIVISION: It is followed by trachea (windpipe).

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Q. No. 2 (ii) **a) TYPE OF CARTILAGE:** The cartilage A at the joint is Hyaline cartilage.

b) CHARACTERSTIC: 1) It is a strong yet flexibe cartilage *

EXAMPLE: It is found at the ends of long bones, nose, larynx, trachea and bronchi

* 2) It provides support, movement of bones at joints, flexibility.

3) Blood vessels donot enter the cartilage and has a matrix with fluid filled spaces called lacuna, containing the cells of cartilage (chondrocytes)

Q. No. 2 (iii) **SELECTIVE REABSORPTION**: It is the second step of urine formation by the kidneys. In this step, 99% of the glomerular filtrate is reabsorbed from the renal tubule into the cappillaries surrounding the renal tubule.

PROCESS: It is done by diffusion, active transport and osmosis

REABSORPTION:

Most of the water and glucose is reabsorbed from the proximal convulated tubule. Here water is reabsorbed by osmosis and salts by diffusion. The descending limb of loop of Henle allows the reabsorption of water. The ascending limb of loop of Henle allows the reabsorption of salts. Distal convulated tubule allows the reabsorption of water.

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Q. No. 2 (iv)

NAME OF GLAND		
A. Parathormone	:	Parathyroid glands (posterior to thyroid gland)
B. Corticosteroids	:	Adrenal glands (above kidneys)
C. Glucagon	:	Pancreas (in abdominal cavity)

Q. No. 2 (v) **a)** **A**: Outermost layer (Sclera)

B: Hole between the iris (pupil)

b) **C**: It is the middle layer of eye called choroid.

COMPOSITION AND FUNCTION: It contains the blood vessels and gives eye most of its dark colour. The dark colour prevents the disruptive reflection within the eye.

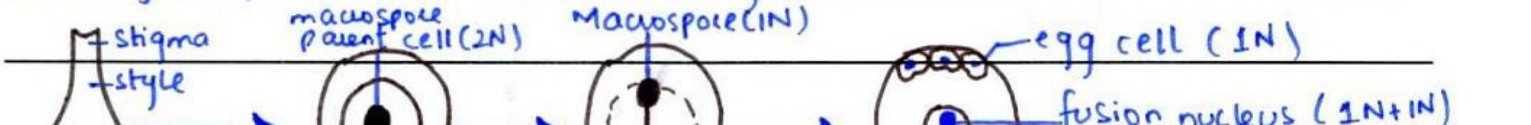
STRUCTURE: It forms a muscular ring at the front called iris. Between iris, there is a hole called pupil. Light passes through the pupil and its size is controlled by iris. The pupil constricts in bright light as the radial muscles relax and it dilates in dim light as the radial muscles contract. A **convex lense** is also present which focuses the light on retina. Attached to the ciliary muscles, it changes shape to see distant (ciliary muscle relax) and nearby objects (ciliary muscle contract).

.....

Q. No. 2 (vi) **FEMALE REPRODUCTIVE PART**: The forth whorl 'gynocium' is the female reproductive part of flower.

STRUCTURE: its indivial units are called carpel (pistil). It consists of a basal ovary, middle style, upper stigma..

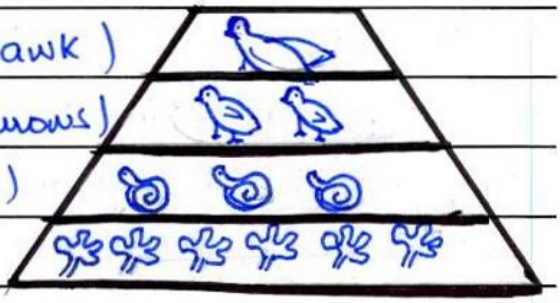
GAMETE FORMATION: The ovary contains one to many ovules. Inside each ovule, one macrospore (1N) is formed by meiosis. The macrospore germinates into the **female gametophyte** generation. It undergoes mitosis and so produces an egg cell and associated structures called the fusion nucleus. The egg cell and associated structures are the female gametophyte generation of flowering plant.



Q. No. 2 (vii) **ECOLOGICAL PYRAMID:** "The graphic representation of the number of individuals, the amount of biomass and the energy present at various trophic levels is called Ecological pyramid."

PYRAMID OF NUMBER: It is the graphic representation of number of individuals present at various trophic levels in an ecosystem.

- The organisms in the start of food chain (producers) are small in size and maximum in number. The organisms at the end (tertiary consumers) are big in size and small in number.



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Q. No. 2 (viii) **a)** This process is called **Binary Fission**. It is a type of asexual reproduction which means 'division in two'. It occurs in prokaryotes (bacteria), unicellular eukaryotes (protozoa) and some invertebrates.

b) • In the binary fission of bacteria, the DNA of the chromosomes duplicate and so 2 copies of DNA are formed (B stage) which move to the opposite poles of cells.

• The cell membrane invaginates in the centre, and divides the cytoplasm into two. A new cell wall is formed across each cross membrane (C stage) and divides the cell into 2 daughter cells.

Q. No. 2 (ix)

a) **HETEROZYGOUS**: The genotype in which the gene pair consists of 2 different alleles is called heterozygous genotype.

EXAMPLE: It is represented by Aa or Bb.

b) **GENOTYPE**: The specific combination of genes in a pair is called its genotype.

TYPES: It has 2 types; homozygous and heterozygous.

EXAMPLE: Albinism is a trait in which normal body pigments are absent. It is controlled by 2 alleles; A and a. The possible combination of alleles (genotype) will be AA, Aa, aa.

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Q. No. 2 (x)

A. **SEDATIVES**: It interacts with the central nervous system and slows the functioning of brain. It causes dizziness, lethargy, slow brain functioning, depression. It may also lead to suicidal thoughts. It induces sedation.

B. **HALLUCINOGENS**: It brings changes in the perception, thought, emotions, consiousness. It effects the sympathatic nervous system and causes pupil to dilate, increase in blood pressure. Marijuana (type of hallucinogen) causes a feeling of well being, large doses can increase heart rate, effect sperm production etc.

C. **HEROIN**: It is deived from morphine and effects the central nervous system and causes drowsiness.

Q. No. 2 (xi)

Q. No. 2 (xii) **CONTINUOUS VARIATION** : The variations which show a wide range of phenotypes and are not distinct are called continuous variations.

MEASURABLE: The phenotypes are measurable.

EFFECT OF ENVIRONMENT: Environment effects the continous variation.

CONTROLLED BY: They are controlled by many pairs of genes.

EXAMOLE: .Human height, weight, intelligence, feet size.

. The individuals of a population have wide range of heights (ranging from very small to large). No population has 2 or 3 dinstint heights. It can be measued and so is continuous variation. Individuals can have different weights (20Kg, 50Kg, 70Kg, 72Kg...) and likewise show variety.

Q. No. 2 (xiii)

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Q. No. 2 (xiv)

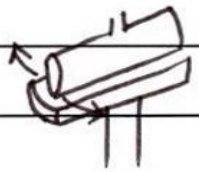
Q. No. 2 (xv) **MOVEABLE JOINTS**: They allow movement in variety of directions. They are of 2 types;

1) **HINGE JOINTS**: They allow movements in only 1 direction. They allow the back and forth movement in only one plane.

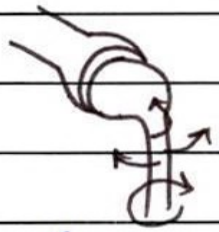
E.g knee joint, elbow joint

2) **BALL AND SOCKET JOINTS**: They allow movements in all directions

E.g Shoulder (pectoral) joint, Hip joint (pelvic)



(Hinge)



(Ball and socket)

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Q. No. 3 (Page 1/4)

Q. No. 3 (Page 2/4)

Q. No. 3 (Page 3/4)

Q. No. 3 (Page 4/4)

Q. No. 4 (Page 1/4)

-a-

BONES:

DEFINITION: Bones are hard, articulated structures present in the skeletal system of the body.

TYPE: They are the hardest connective tissue of body.

FUNCTION: The bones provide;

1) Movement: The bones are connected to the skeletal muscles of body and the contraction of muscles lead to the movement of bones at joints as they exert a pulling force on bones.

2) Protection: Bones protect the internal organs. E.g skull protects the brain, ribs protect heart and lungs, vertebral column protects spinal chord.

3) Support: They provide support to body. E.g, the backbone (vertebral column) that extends to the lower back supports the body.

4) Formation of red and white blood cells

5) Store minerals (Calcium, phosphate)

PARTS OF BONE:

Bone has 2 parts;

1) Compact bone 2) Spongy bones

COMPACT BONE:

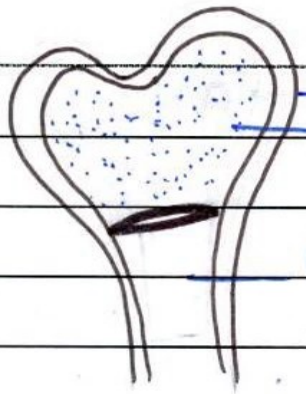
The hard outer region of bone is called the compact bone

SPONGY BONE:

The inner soft and porous region of bone is spongy bone. It contains blood vessels and bone marrow.

Q. No. 4 (Page 2/4)

Structure of bone



COMPOSITION OF MATRIX: The matrix of bone consist of collagen fibres and stores minerals e.g Calcium and phosphate.

TYPES OF BONE CELLS: There are 3 types;

Osteoblasts: Bone forming cells (young, immature)

Osteocytes: Mature bone cells

Osteoclasts: Bone reabsorbing cells (old cells)

BONES IN HUMAN BODY:

There are 206 bones divided in the axial and appendicular skeleton.

- **AXIAL SKELETON:** Contains 80 bones;

Skull: Consist of 22 bones (8 cranial, 14 facial)

Ear: 6 middle ear oscicles

Neck: 1 Hyoid Bone

Chest: 1 main bone (Sternum) and 24 ribs

vertebral column: 33 vertebral discs (vertebraes)

- **APPENDICULAR SKELETON:** Contains 126 bones;

Shoulder (pectoral girdle): 4 bones

Arms: 6 bones

Hand: 54 bones

Hip: 2 bone

Legs: 6 bones

Q. No. 4 (Page 3/4) (b)

FERMENTATION:

DEFINITION: The incomplete oxidation-reduction of a glucose molecule is termed as fermentation.

PROCESS: It is a chemical process.

DISCOVERY: In 1857, Pasteur convinced the scientific community that all fermantation were the results of microbial activities. It was always followed by the developement of microorganisms.

PROCESS OF FERMENTATION:

- **GLYCOLYSIS:** The first step of fermentation is similar to respiration (glycolysis). A molecules of glucose is broken down into 2 molecules of pyruvic acid.
- **SECOND STEP:** Different microorganisms react with pyruvic acid to form different compounds.

Glucose

↓ Glycolysis

Pyruvic acid

Lactic acid ethanol other organic compounds

TYPES: There are 2 types of fermentation;

- **ALCOHLIC FERMENTATION:**

Occurance: It is done by yeast (Saccharomyces cerevisae)

Process: CO_2 is removed from pyruvic acid, the product acetaldyhyde is reduced to ethanol.

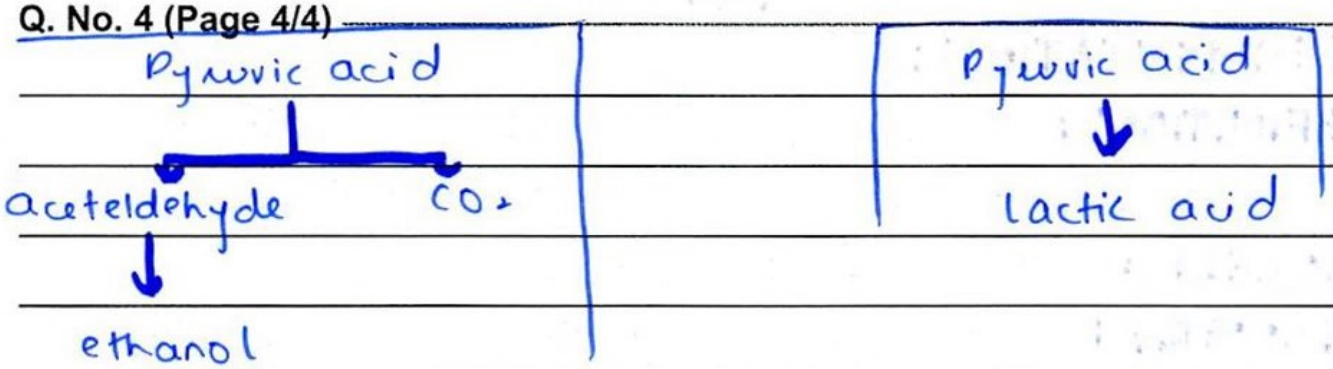
Uses: Used in making bread, beer, wine, spirits

- **LACTIC ACID FERMENTATION:** (Bacteria)

Occurance: • Streptoccocas • Lacto Bacillus species

Process: Pyruvic acid converts into lactic acid

Q. No. 4 (Page 4/4)



PRODUCTION OF FERMENTED FOOD:

Fermentation makes the food more nutritious, tasty, digestible. It also preserves the food.

- **CEREAL PRODUCTS:** Bread is made by fermentation process. The wheat flour is converted to bread by S. cerevisae and some lactic acid bacteria.
- **DIARY PRODUCTS:** Cheese is formed when milk protein coagulates. The coagulation occurs when acid of lactic acid bacteria reacts with milk protein. Yougail is formed from milk by lactic acid bacteria
- **FRUITS, VEGETABLES:** Fermentation along with use of salts, acids are used to preserve pickles, fruits, vegetable etc.
- **BEVERAGE:** Beer is made from cereal grains that are are dried, malted and ground into powder. The yeast converts the glucose into ethanol. Grapes are directly converted to wine by yeast.

Q. No. 5 (Page 1/4)

(a)

INTRODUCTION:

Two types of responces are made when information is sent from CNS;

- The higher centres of brain control the voluntary action. (under concious control)
- When the information is not passed to the higher centre of brain, an involuntary action is produced (not under concious control.

REFLEX ACTION:

Such an involuntary action that is rapid and quick is called reflex action.

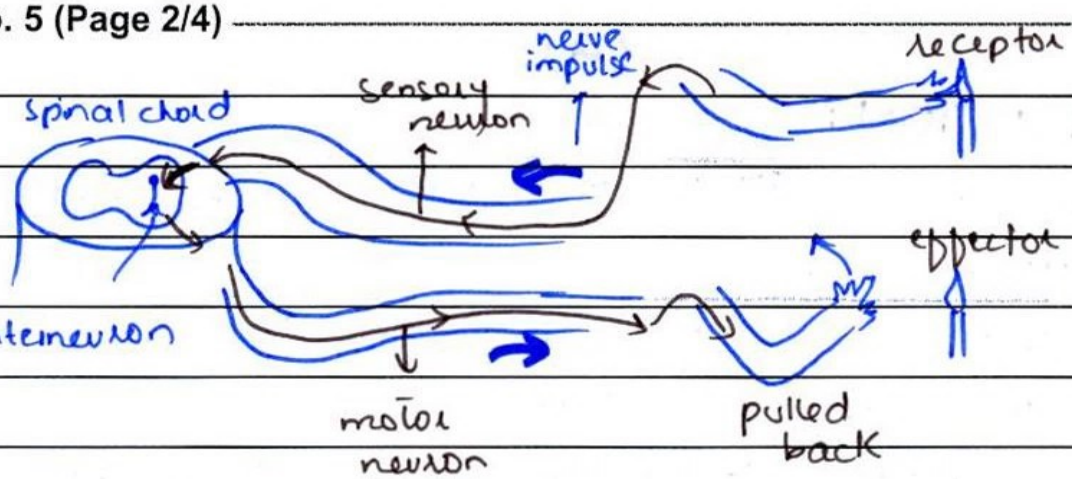
REFLEX ARC:

The path taken by the nerve impulse to produced a reflex action is called reflex arc.

EXAMPLE:

When we touch a hot object, we immediately pull our hand away. The Temperature (heat) stimulates the sensory neurons at finger (receptor). As a result a nerve impulse is generated which are carried by the sensory neurons to spinal chord (coordinator). The spinal chord sends the impulse to motor neurons at effector. At the same time, some interneurons sends the message to brain to signal what happened and peciever pain.

Q. No. 5 (Page 2/4)



VEGETATIVE PROPOGATION : When the vegetative part of plant (stem, leaf, roots) grow into new organism, this is called vegetative propogation.

ARTIFICAL VEGETATIVE PROPOGATION :

1) CUTTINGS :

- Cuttings are taken from the merastimatic region of plant which have ability to grow. The cuttings are placed in suitable medium and soil for the growth of roots and shoots. After it the plant grows into a new plant with the characteristics similar to parent plant.

  E.g; . Roses, ivy, grapewine are produced by stem cutting.

  . Potato is enlarged root. It is placed in soil which produces plantlets. They are removed and placed into field.

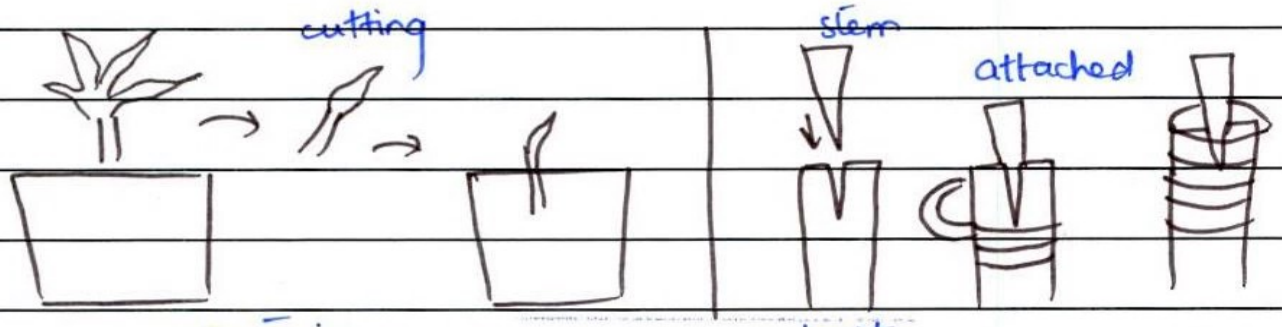
  . Sugarcane production.

Q. No. 5 (Page 3/4)

2) GRAFTING:

A piece of stem is cut from a plant and attached with plant of established root system. After some time, the vascular bundles of attached stem and host plant combine and both grow together

E.g Peach tree, plum tree, fruitless trees (grapes)



Cutting

Grafting

Q. No. 5 (Page 4/4)

Cutting Line