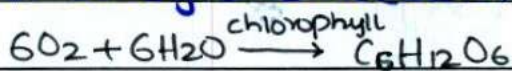


Q. No. 2 Part (i)

Photosynthesis

1. It is a process in which plants make their own food (glucose).
2. In plants, it occurs only in day time.
3. CO_2 and water are the raw products required
4. Glucose and O_2 is produced.
5. It occurs in green parts of plants. (chlorophyll)
6. Sunlight is needed for this.



Respiration

1. It is a process in which C-H bonds in food (glucose) are broken down.
2. It occurs all the time.
3. Glucose and O_2 is required for this.
4. CO_2 and H_2O is produced.
5. It occurs in every cell of plant.
6. Energy is produced in this.



Q. No. 2 Part (ii)

Lobes of Cerebrum :

Lobe	Function
1. <u>Frontal Lobe</u>	1. Controls motor functions. 2. Permits conscious control of skeletal muscles. 3. Coordinates movements involved in speech.
2. <u>Occipital Lobe</u>	Receives sensory information from eyes and responsible for vision.
3. <u>Temporal Lobe</u>	Concerned with hearing and smell.

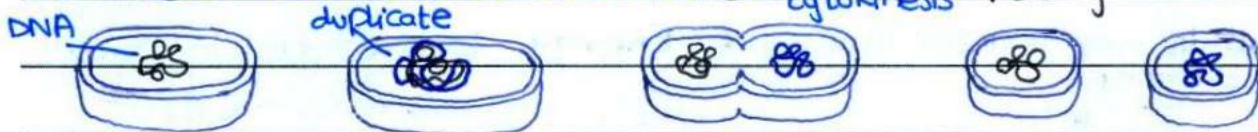
Q. No. 2 Part (iii) **Binary Fission :**

Meaning : Binary fission means "division into 2."

Type : It is a type of asexual reproduction and most common form of reproduction in prokaryotes, unicellular eukaryotes and some invertebrates.

Binary fission in Prokaryotes :

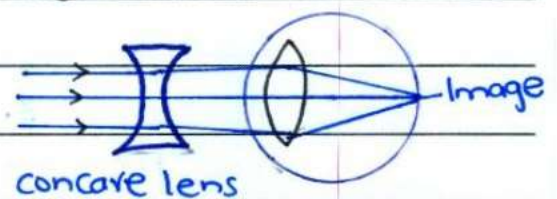
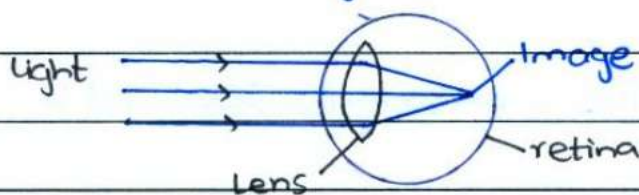
Binary fission occurs in bacteria. In bacteria, DNA duplicates and 2 copies of DNA are formed. The 2 copies move to opposite poles. The cell membrane invaginates in the centre and new cell wall is deposited between 2 cross membranes. 2 daughter bacteria are formed identical to each other.



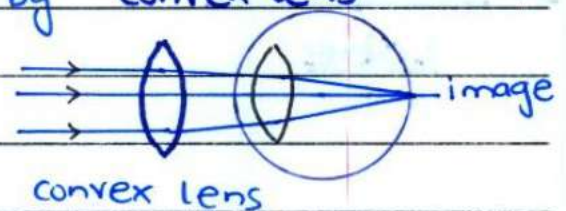
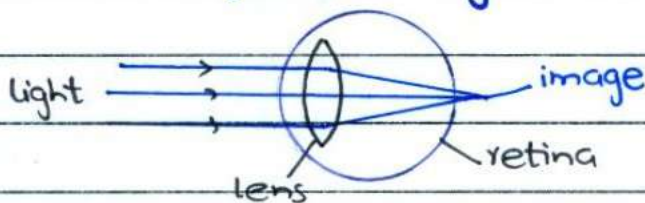
Q. No. 2 Part (iv) **Disorders of eye :**

B : The disorder in B is Myopia (Short sight). It is caused due to elongation of eye ball and image forms in front of retina. They can't see far objects clearly.

Correction : By use of "concave lense".



A : It is hypermetropia (long sight) caused due to shortening of eyeball. Image behind the retina and such people can't see near object clearly. Correction : by "convex lens"



Q. No. 2 Part (v) **Single cell Protein :**

Definition : SCP refers to the protein content extracted from pure or mixed cultures of algae, bacteria, yeast or fungi.

Why is it called SCP? : It is called so because the organisms used are single celled or filamentous individuals.

Substrates : These organisms use substrates like methane (natural gas), agricultural waste, industrial wastes etc.

Growth : These organisms are grown in fermenters.

Advantages : As the world population is increasing, to fulfill protein deficiency, SCP is used.

- | | |
|---------------------------------------|----------------------------|
| 1. It doesn't depend on seasons. | 4. Provides vitamins also. |
| 2. Less land required. | 5. Reduces Pollution. |
| 3. has high protein content (30-70%). | 6. Less time required. |
-

Q. No. 2 Part (vi) **Diagram:**

The diagram shows "spore formation" in *Rhizopus*.

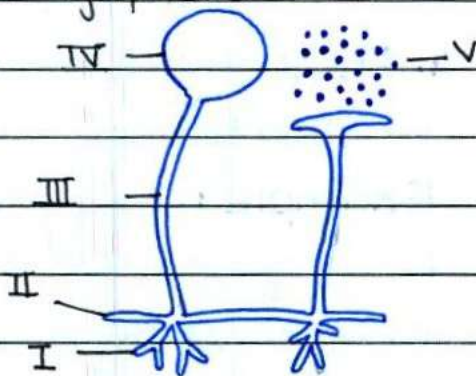
I : Rhizoids

IV : Sporangium

II : Stolon

V : Spores

III : Sporangioophores



Q. No. 2 Part (vii) **4 o'clock Flower:**

4 o'clock flower is an example of Incomplete dominance in which the 2 different alleles express themselves as a mixture (blend) with neither dominant.

Key:

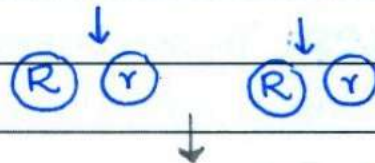
Red flower RR

White flower rr

Pink flower Rr

$F_1 \times F_1$

Rr x Rr



P ₁	RR	x	rr	
	↓		↓	
	R		r	
	↘		↙	
F ₁			Rr	

	R	r	
R	RR	Rr	
r	Rr	rr	

F₁ generation consists of all

Red : Pink : White

Pink (blend of white and red)

1 : 2 : 1 (Phenotype)

Q. No. 2 Part (viii) **Variations** :

<u>Continuous Variation</u>	<u>Discontinuous Variation</u>
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1. They show a complete range of phenotypes.	1. They show distinct or clear-cut phenotypes.
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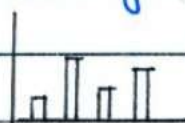
2. They can be measured.	2. They can't be measured.
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3. Controlled by more than 1 gene pair.	3. Controlled by alleles of only 1 gene pair.
---	---

4. Affected by environment.	4. Environment has no effect on discontinuous variation.
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Example: Height, weight, intelligence etc.	Example: Tongue rolling, Blood groups, 6 th finger etc.
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There is complete range of heights:	There is nothing except 4 blood groups.
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Q. No. 2 Part (ix) - **Hormones:**

Hormones	Functions
1. ADH (anti-diuretic hormone)	It is released by pituitary gland and increases rate of reabsorption. When there is more water in body fluids, it is less released. When there is less water, it is released more to maintain water level.
2. Adrenaline (Emergency hormone).	It is released by adrenal glands when we face any emergency situation. It increases blood pressure, heart rate, blood flow to limbs etc to deal stress, anxiety etc.
3. Oestrogen	Released by ovaries. Responsible for appearance of secondary female characters eg: developing breast and depositing Ca in bone.

.....

Q. No. 2 Part (x) **Antibiotic Resistance:**

Antibiotics are used to treat bacterial infections however bacteria have ability to resist their function by:

1. **Mutation**: It is one of the causes that bacteria develop resistance.
2. **Internal mechanism**: Sometimes their internal mechanism stops working of antibiotics.
3. **Conjugation**: The bacteria that has antibiotic resistive genes can also transfer the genes to others and this helps all bacteria get resistance.
4. **No efficacy**: The use of antibiotics in diseases in which they have no efficacy also develops resistance. (e.g. use of antibiotics in viral infections).
5. **Overuse**: Overuses also develops resistance.

Q. No. 2 Part (xi) **Antagonism:**

Flexion

1. It is caused by flexor muscles.
2. During flexion, the flexor muscle contracts.
3. Due to contraction, the joint is bent at insertion.
4. Bending is called flexion.
5. During flexion, extensor muscles relax.

Example: Biceps (flexor) contracts, bends the arm, produces flexion at elbow joint.

Extension

1. It is caused by extensor muscles.
2. During extension, extensor muscle contracts.
3. Due to contraction, the joint is straightened at insertion.
4. Straightening is called extension.
5. During extension, flexor muscles relax.

Example: Triceps (extensor) contracts, straightens the arm, produces extension at elbow joint.

Use for rough work

Mechanism of Breathing

Definition : The physical movements that cause outside air to come in and inside air to go out is called breathing.

Breathing occurs in 2 steps i.e Inhalation & Exhalation.

1. Inhalation :

It is also called inspiration. During this the outside air comes inside the body. Following changes in respiratory system cause it :

1. Rib muscles	Rib muscles contract
2. Ribcage	moves upward.
3. Diaphragm	contracts and moves down.
4. Volume / Area of Thoracic cavity	Area increases.
5. Pressure on lungs	Decreases.
6. Pressure in lungs	Pressure inside also decreases.
7. Result	As a result, outside air comes in to equalize pressure on both sides. due to expansion of lungs.

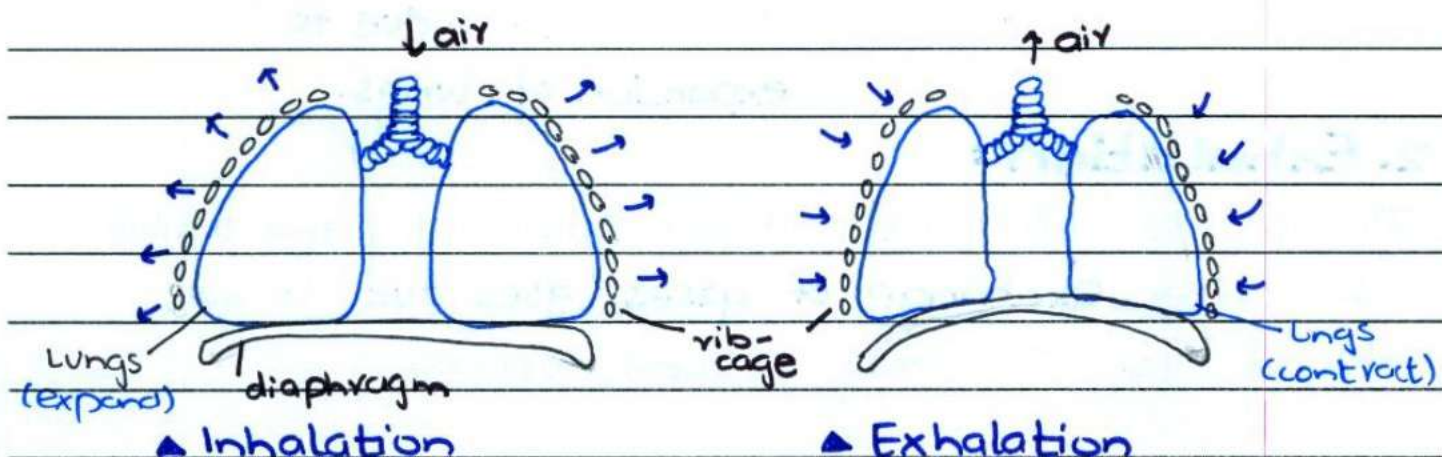
2. Exhalation :

It is also called expiration. During it, the inside air after exchange of gases goes out to get rid of CO_2 . Following process occurs.

1. Rib muscles	intercoastal muscles relax.
2. Ribcage	Ribcage moves downward.
3. Diaphragm	Relaxes & gets raised dome shape
4. Volume of Thoracic cavity	Volume decreases.
5. Pressure on lungs	Increases.
6. Pressure in lungs	Pressure inside also increases.
7. Lungs	So, lungs contract.
8. Result	As a result, inside air is expelled out.

1. Normal breathing rate: Normal rate is 16-20 times per minute. However, it can also increase.

2. Increase in breathing rate: When we do hard job, our muscles carry out more respiration to provide energy, as a result more CO_2 is released in blood. This stimulates the respiratory centre medulla in brain that sends signals to ribs and diaphragm to increase the rate to remove extra CO_2 . Hence, the rate increases upto 30-40 times / minute.



LAW OF SEGREGATION

Definition:

"During gamete formation, the gene (allele) pair separates in meiosis and each allele enters one gamete. When fertilization occurs, (egg and sperm) combines, the offspring again gets gene in pair 1 from each parent."

Hybrid: The variety obtained by crossing 2 genetically different parents is called hybrid.

"Law of segregation involves monohybrid cross"

It means that only 1 trait is studied at a time.

Mendel's Experiment:

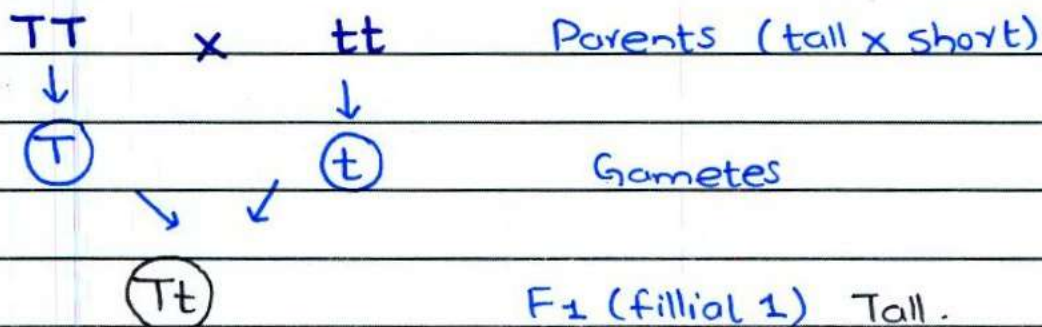
He chose pea plant and studied different traits.

Key :

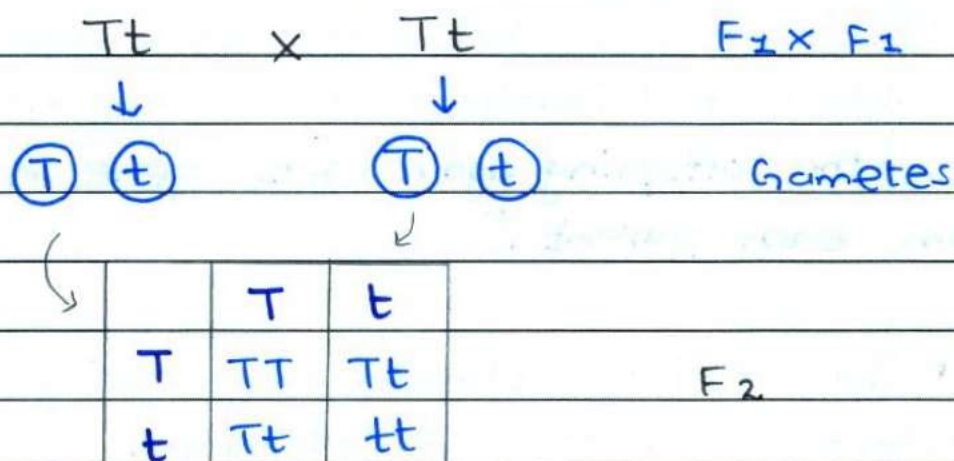
Dominant trait : Tall height TT

Recessive trait : Small height tt

Cross :



Tt represents the phenotype is tall but with heterozygous genotype.



phenotype Tall : Short
3 : 1

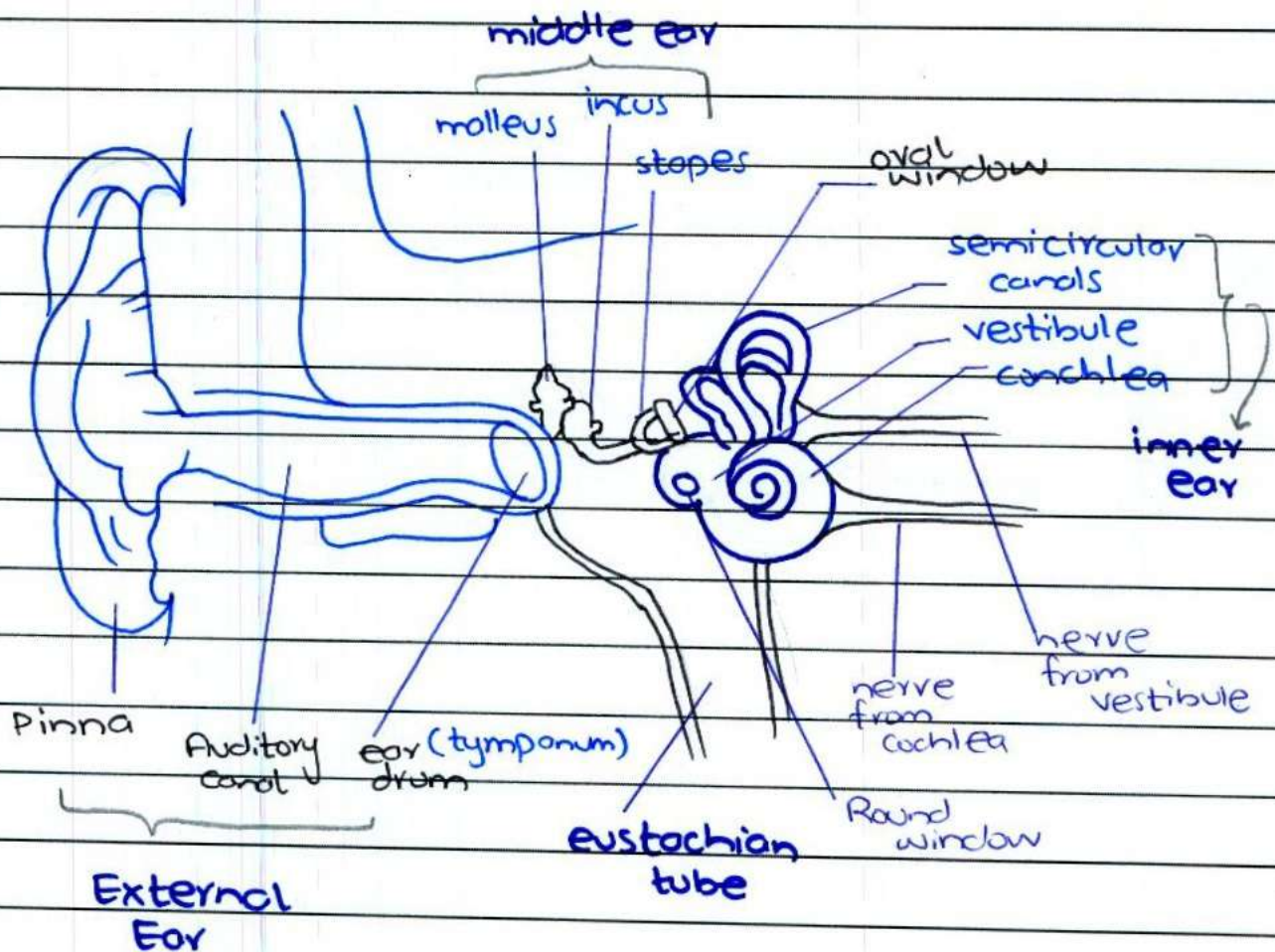
genotype homozygous : heterozygous : homozygous
tall tall short
1 : 2 : 1

Explanation:

2 parents with homozygous tall and homozygous short height were crossed. All the F_1 were Tall.

It says tall - dominant, short - recessive. In next generation, F_1 were allowed to self fertilize, as a result, we got 3:1 of tall to short plants.

Structure of Ear



Q. No. 5 (Page 2) _____

NEGATIVE FEEDBACK

Feedback mechanism

"Regulation of a process by output of the same process is called feedback mechanism".

Many processes in our body are controlled by feedback mechanisms such as hormone secretions. There are 2 types:

1. Positive feed back.
2. Negative feed back.

Definition :

"The output of a process inhibits the process is called negative feed back".

Example :

"Secretion of insulin and glucagon".

When we eat a meal rich in carbohydrates and the blood glucose level rises above normal value of $80-120 \text{ mg/100 ml}$. In this condition, pancreas secrete insulin which influences the liver to take excess glucose from blood and store it in the liver in the form of glycogen. When excess is stored, blood glucose level comes to normal. In this condition, insulin secretion is stopped.

When our blood glucose level falls below normal value of $80-120\text{mg}/100\text{ml}$ pancreas secrete glucagon which influences the liver to release glucose in blood by converting glycogen to glucose. When glucose is released, blood glucose level increases and comes to normal value. This normal value stops secretion of glucagon.

Overall result : The blood glucose level controls secretion of production of insulin and glucagon. Which means normal value of glucose in blood (output) stops secretion of hormones.

Characteristics:

Negative feedback has the property that it is homeostatic in mechanism and converts a value to normal.

