

**ICSE 2025 EXAMINATION**  
**Sample Question Paper - 6**  
**BIOLOGY**

**Time: 2 Hours**

**Max. Marks: 80**

**General Instructions:**

1. Answer to this Paper must be written on the paper provided separately.
2. You will not be allowed to write during first 15 minutes.
3. This time is to be spent in reading the question paper.
4. The time given at the head of this Paper is the time allowed for writing the answers.
5. Section A is compulsory. Attempt any four questions from Section B.

**SECTION – A**

(Attempt all questions from this Section.)

**QUESTION 1.**

**Choose the correct answers to the questions from the given options.**

(Do not copy the questions, write the correct answer only.)

**(i) ..... is the pressure exerted by all contents on the cell wall.**

- |                      |                      |
|----------------------|----------------------|
| (a) Osmotic pressure | (b) Turgor pressure  |
| (c) Wall pressure    | (d) All of the above |

**Answer:** (b) Turgor pressure

**(ii) Mention the exact location of the following :**

**Guard Cells :**

- |                            |                           |
|----------------------------|---------------------------|
| (a) Around the root hairs. | (b) Around the lenticels. |
| (c) Around the thylakoids. | (d) Around the stoma.     |

**Answer:** (d) Around the stoma.

**(iii) Assertion (A):** Salivation at the sight of food is not a natural reflex action.

**Reason (R):** It is a learned response, not an innate reflex.

- (a) Both Assertion (A) and Reason (R) are true, and Reason (R) is the correct explanation of Assertion (A).
- (b) Both Assertion (A) and Reason (R) are true, but Reason (R) is not the correct

explanation of Assertion (A)

(c) Assertion (A) is true, but Reason (R) is false.

(d) Assertion (A) is false, but Reason (R) is true

**Answer:** (a) Both Assertion (A) and Reason (R) are true, and Reason (R) is the correct explanation of Assertion (A).

**(iv) Which one of the following is non-biodegradable?**

(a) Vegetable peel

(b) DDT

(c) Cardboard

(d) Bark of trees

**Answer:** (b) DDT

**(v) Normal blood pressure in human is**

(a) 80/120 mm Hg

(b) 80/110 mm Hg

(c) 100/80 mm Hg

(d) 120/80 mm Hg

**Answer:** (d) 120/80 mm Hg

**(vi) Lamarckism fails to explain which of the following phenomenon?**

(a) An intellectual person having a dull son

(b) Absence of all the four limbs amongst amphibians

(c) Exceptionally long neck of giraffe

(d) Loss of vision in cavedwelling mammals

**Answer:** (a) An intellectual person having a dull son

**(vii) Assertion (A)** The proximal convoluted tubule of a nephron is present in cortex.

**Reason (R)** Both the Bowman's capsule and proximal convoluted part lie in the cortex giving it a dotted appearance in sectional view.

(a) Both assertion and reason are true

(b) Both assertion and reason are false

(c) Assertion is true and reason is false

(d) Assertion is false and R is true

**Answer:** (a) Both assertion and reason are true

**(viii) Riya studied the types of asexual reproduction in plants. She created the following table:**

Method	Example
P	Formation of new plants from tubers.
Q	Formation of new plants from stem cuttings.

**Identify the correct pair.**

- (a) P – Vegetative propagation, Q – Grafting
- (b) P – Vegetative propagation, Q – Stem cutting
- (c) P – Budding, Q – Vegetative propagation
- (d) P – Grafting, Q – Budding

**Answer:** (b) P – Vegetative propagation, Q – Stem cutting

**(ix) Gigantism and dwarfism are the diseases related to**

- (a) prolactin hormone of mammary gland
- (b) growth hormone of adenohypophysis
- (c) luteinising hormone of pituitary gland
- (d) thyroid stimulating hormone of thyroid gland

**Answer:** (b) growth hormone of adenohypophysis

**(x) Which of the following is not a part of the female reproductive system in human beings?**

- (a) Uterus
- (b) Ureter
- (c) Ovary
- (d) Fallopian tube

**Answer:** (b) Ureter

**(xi) Assertion (A):** The pyrimidine bases present in DNA are thymine and cytosine.

**Reason (R):** Apart from pyrimidine bases, purine bases (adenine and guanine) are also present in DNA.

- (a) Both Assertion (A) and Reason (R) are true, and Reason (R) is the correct explanation of Assertion (A).
- (b) Both Assertion (A) and Reason (R) are true, but Reason (R) is not the correct explanation of Assertion (A)
- (c) Assertion (A) is true, but Reason (R) is false.
- (d) Assertion (A) is false, but Reason (R) is true

**Answer:** (b) Both Assertion (A) and Reason (R) are true, but Reason (R) is not the correct explanation of Assertion (A)

**(xii) Ravi observed that in autumn, mature leaves and fruits fell naturally from plants in his garden. He learned that a specific hormone triggers this fall. The plant hormone triggering the fall of mature leaves and fruits from plants is**

- (a) auxin
- (b) gibberellin
- (c) kinetin
- (d) abscisic acid

**Answer:** (d) abscisic acid



**(xiii) Assertion (A):** Homo erectus had a cranial capacity of 850-1000 cc.]

**Reason (R):** Homo erectus was one of the early human ancestors known for walking upright and using simple tools.

(a) Both Assertion (A) and Reason (R) are true, and Reason (R) is the correct explanation of Assertion (A).

(b) Both Assertion (A) and Reason (R) are true, but Reason (R) is not the correct explanation of Assertion (A)

(c) Assertion (A) is true, but Reason (R) is false.

(d) Assertion (A) is false, but Reason (R) is true

**Answer:** (a) Both Assertion (A) and Reason (R) are true, and Reason (R) is the correct explanation of Assertion (A).

**(xiv) A biology teacher asked her students to name two examples of endocrine glands.**

Raj said: Thyroid and Adrenal

Sonu said: Liver and Thyroid

Lata said: Pancreas and Pituitary

Abhay said: Kidney and Adrenal

**Who were correct?**

(a) Raj and Lata

(b) Sonu and Abhay

(c) Raj and Abhay

(d) Lata and Sonu

**Answer:** (a) Raj and Lata

**(xv) A cell has five pairs of chromosomes. After mitotic division, the number of chromosomes in the daughter cells will be:**

(a) Five

(b) Ten

(c) Twenty

(d) Forty

**Answer:** (b) Ten

## **QUESTION 2.**

**(i) Name the following**

(a) The muscle which guards the urethra.

(b) The phenomenon by which living or dead plant cells absorb water by surface attraction.

(c) Two sex-linked inherited diseases.

(d) A condition caused due to the hyposecretion of thyroxine in children.

(e) Long thread like part of the nerve cell.

**Answer:**

- (a) Sphincter muscle
- (b) Imbibition
- (c) Haemophilia and colour blindness
- (d) Cretinism
- (e) Axon

**(ii) Fill in the blanks with suitable words.**

The loss of excess water in the form of drops along the (a) ..... due to excessive (b) ..... is called guttation. In certain plants, like (c) ....., grass etc. the root pressure is high enough to force the water all the way through the (d) ..... and comes out through the ends of (e) .....

**Answer:**

- (a) Leaf margin
- (b) Root pressure
- (c) Tomato/Banana
- (d) Stem
- (e) Leaf veins

**(iii) Arrange and rewrite the terms in each group in the correct order so as to be in a logical sequence beginning with the term that is underlined.**

- (a) Ureter, Kidney, Renal artery, Urinary bladder
- (b) Intestine, Intestinal artery, Hepatic portal vein, Liver
- (c) Right auricle, Pulmonary artery, Vena cava, Right ventricle
- (d) Sperm duct, Sperm, Vagina, Urethra coitus.
- (e) Fertilisation, Gamete formation, Embryo, Zygote.

**Answer:**

- (a) Kidney, Renal artery, Ureter, Urinary bladder
- (b) Intestine, Intestinal artery, Hepatic portal vein, Liver
- (c) Vena cava, Right auricle, Right ventricle, Pulmonary artery
- (d) Sperm, Sperm duct, Vagina, Urethra coitus
- (e) Gamete formation, Fertilisation, Zygote, Embryo

**(iv) Read the explanations given below and name the structure:**

**Example:** The tube through which air passes from the larynx to the lungs.

**Answer:** Trachea

- (a) The substance that gives red blood cells their color.
- (b) The organ responsible for producing bile.
- (c) The hormone that regulates blood sugar levels.

- (d) The tissue in plants responsible for transporting water.  
 (e) The structure in the human brain that controls involuntary actions.

**Answer:**

- (a) Hemoglobin  
 (b) Liver  
 (c) Insulin  
 (d) Xylem  
 (e) Medulla oblongata

**(v) Match the items given in Column I with the most appropriate ones in Column II and rewrite the correct matching pairs.**

	Column I		Column II
A.	Family welfare	1.	Alkaline secretion into semen
B.	Prostate gland	2.	Copper-T
C.	IUDs	3.	Red triangle
D.	Vasectomy	4.	Death rate
E.	Mortality	5.	Birth rate
		6.	Vas deferens

**Answer:**

	Column I		Column II
A.	Family welfare	3.	Red triangle
B.	Prostate gland	1.	Alkaline secretion into semen
C.	IUDs	2.	Copper-T
D.	Vasectomy	6.	Vas deferens
E.	Mortality	4.	Death rate

## SECTION – B

(Attempt any four questions.)

### QUESTION 3.

**(i) If a colorblind man marries a woman with normal vision, what will be the nature of their children ?**

**Answer:** Their daughter will be a carrier of colourblindness but their son will have normal vision.

**(ii) Why did Mendel select garden pea for his experiments?**

**Answer:** Gregor Mendel choose pea plants to perform his experiments because they grow quickly, are easy to breed, and have a variety of traits.

**(iii) What happens during metaphase of mitosis?**

**Answer: Mitosis:**

1. Mitosis is a process that occurs in all cells in the body except reproductive cells.
2. The number of chromosomes in the daughter cells remains the same (i.e., diploid  $2n$ ); hence it is called equational division.
3. Mitosis results in the formation of two daughter cells.
4. Prophase, metaphase, anaphase, and telophase are the four stages of mitosis.

**Metaphase:**

1. Maximum condensation of chromosome occurs.
2. Spindle fibers attach to chromosomal kinetochores.
3. Through spindle fibers, chromosomes are transported to the spindle equator.
4. The duplicated chromosomes align themselves in the equatorial plane ( metaphase plate) at this stage.

**(v) If a homozygous pure tall plant (T) is crossed with a homozygous pure dwarf plant (t), what will be the appearance of :**

- (a)  $F_1$  progenies
- (b)  $F_2$  progenies



**Answer:** (a) When a **homozygous pure tall plant (TT)** is crossed with a **homozygous pure dwarf plant (tt)**, the following happens in the F<sub>1</sub> generation:

**1. Parental Genotypes:**

- Tall plant (TT) is homozygous dominant.
- Dwarf plant (tt) is homozygous recessive.

**2. F<sub>1</sub> Generation:** All the F<sub>1</sub> progenies will inherit one allele from each parent:

- From the tall parent (TT), the F<sub>1</sub> plants will receive one **T** allele.
- From the dwarf parent (tt), the F<sub>1</sub> plants will receive one **t** allele.

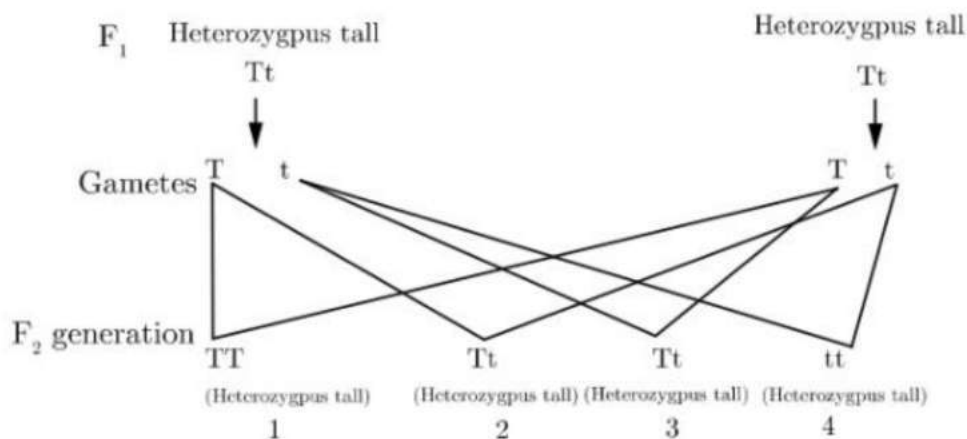
So, all the F<sub>1</sub> progeny will have the genotype **Tt**, which is **heterozygous**.

**3. Appearance of F<sub>1</sub> Progenies:**

- The **T** allele is dominant over the **t** allele.
- Therefore, all the F<sub>1</sub> plants will appear **tall** because the presence of just one dominant **T** allele (heterozygous Tt) will cause the tall phenotype to be expressed.

(b) The F<sub>1</sub> hybrids are self-pollinated and crossed to produce F<sub>2</sub> progenies as follows:

Three plants will be tall and one plant will be dwarf in F<sub>2</sub> generation. Out of three tails one will be homozygous and two will be heterozygous.



**QUESTION 4.**

**(i) What are the components of vulva ?**



**Answer:** The vulva consists of the mons pubis, labia majora, labia minora, clitoris, urethral opening, and vaginal opening.

**(ii) What is umbilical cord?**

**Answer: Umbilical Cord:**

1. It is a flexible, tubular formation between the fetus and the placenta of the mother.
2. It is also known as the birth cord.
3. Foetus's belly is attached to the umbilical cord.
4. A blood vessel in the umbilical cord transports fetal blood from and to the placenta.
5. The umbilical cord blood (cord blood) is 100% baby blood.
6. The cord consists of two umbilical arteries and one vein.
7. It is an important source of stem cells.

**(iii) Explain briefly :**

**Most often only one embryo is formed at a time although there are two ovaries in women.**

**Answer:** One ovum under the influence of hormones is released alternatively every month.

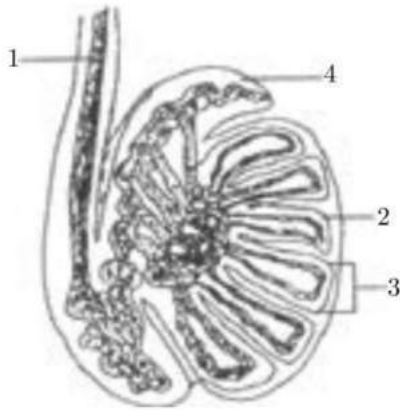
**(iv) Mention the functions of the different parts of a nephron.**

**Answer:**

1. Glomerulus: Filters blood, allowing small molecules like water, glucose, and waste products to pass into Bowman's capsule.
2. Bowman's Capsule: Collects the filtered fluid from the glomerulus.
3. Proximal Convoluted Tubule: Reabsorbs most of the filtered water, glucose, amino acids, and electrolytes back into the bloodstream.
4. Loop of Henle: Creates a concentration gradient in the medulla, allowing for efficient reabsorption of water.
5. Distal Convoluted Tubule: Regulates the reabsorption of sodium and water, and secretes potassium and hydrogen ions.

6. Collecting Duct: Reabsorbs water under the influence of antidiuretic hormone (ADH), concentrating the urine.

**(v) Arjun is studying a diagram showing the lateral section of a testis in a man.**



**Study it carefully and answer the questions that follow:**

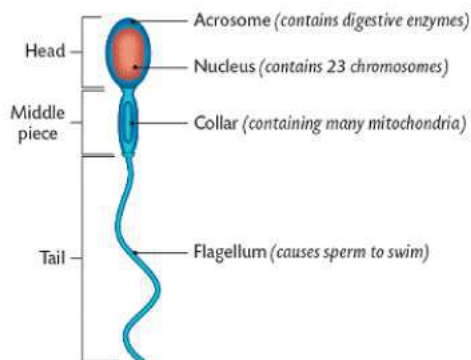
- (a) Label the parts 1 to 4 of the diagram.
- (b) State the functions of the parts labelled 1 and 2.
- (c) Draw a labelled diagram of a sperm.

**Answer:**

- (a) 1 Vas deferens
- 2. Seminiferous tubule
- 3. Testicular lobules
- 4 – Epididymis

- (b) Part 1 - To transport sperms.
- Part 2 - Production of sperms.

(c)



### **QUESTION 5.**

**(i) Mention any Two adaptations found in plants to favour the process of photosynthesis.**

**Answer:**

- (i) Large surface area of leaves.
- (ii) Presence of more stomata.
- (iii) The thinness of leaves.

**(ii) Explain the terms:**

- (a) Diffusion
- (b) Turgidity

**Answer: (a) Diffusion:**

1. Diffusion means to disperse.
2. Diffusion can be defined as the movement of ions/ atoms/ molecules of a substance from the region of their higher concentration to the region of their lower concentration till equilibrium is reached.
3. The movement is due to the kinetic energy of the molecules.
4. Water passes into the cell by diffusion through a freely permeable cell wall.

**(b) Turgidity:**

1. Turgidity is a cellular phenomenon of cell swelling because of the absorption of high fluid content.
2. The cells take up water and it gets stored in vacuoles resulting in swelling of cells.
3. Turgidity occurs because of the presence of the cell wall and the osmoregulatory effect of the vacuole.
4. The turgor pressure because of turgidity is maintained by osmosis.

**(iii) Blowing wind can be useful to the plants in many ways. Mention any three such uses giving a suitable example wherever possible.**

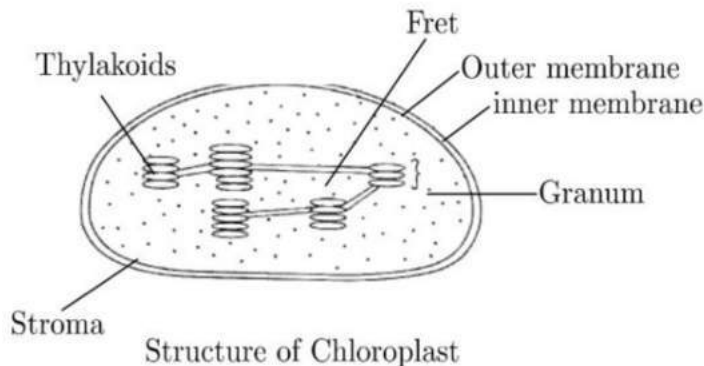
**Answer:** Some of the uses of blowing winds for plants are as follows:

- (a) Blowing wind helps in the dispersal of fruits and seeds of the plants, e.g. madar (oak).
- (b) It helps in cross-pollination, e.g. maize.

(c) It also increases the rate of transpiration and absorption of water and minerals in all the plants.

**(iv) Draw a simplified diagram of a chloroplast.**

**Answer:**



**(v) Potato cubes 1 cm in size were placed in two containers, one containing water, the other containing concentrated sugar solution. After about 24 hours when the cubes were examined, then those placed in water were found to be firm and had increased in size by a few millimeters. Those placed in concentrated sugar solution were found to be soft and had decreased in size. Use the above information to answer the questions that follow :**

(a) Account for the firmness and increase in size of the potato cubes which were placed in water.

(b) Account for the softness and decrease in size of the potato cubes which were placed in the sugar solution.

(c) Name and define the physical process being investigated in this experiment.

**Answer:** (a) Water is hypotonic to the potato cells, due to which endosmosis occurs and water enters the potato cells. The protoplasm swells up pressing tight against the cell wall. The cells are fully distended i.e. turgid. This causes the firmness and increases in the size of the potato cubes when placed in water.

(b) The sugar solution is hypertonic to the potato cells, due to which exosmosis occurs and water flows out of the potato cells. The potato cell loses its distended appearance, the cytoplasm shrinks and the plasma membrane withdraws from the cell wall. The cells become limp or flaccid. This causes the softness and decrease in the size of the potato cubes when placed in a sugar solution.



(c) The process being investigated is osmosis. Osmosis is the diffusion of water molecules across a semi-permeable membrane from a more dilute solution (with a lower solute concentration) to a less dilute solution (with a higher solute concentration).

#### QUESTION 6.

(i) What are the various parts of the external ear ?

**Answer:** Pinna, auditory canal and tympanic membrane.

(ii) The given diagram shows a stage during mitotic division in an animal cell:

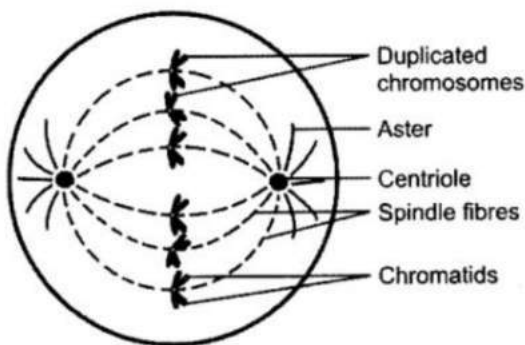


(a) Identify the stage. Give a reason to support your answer.

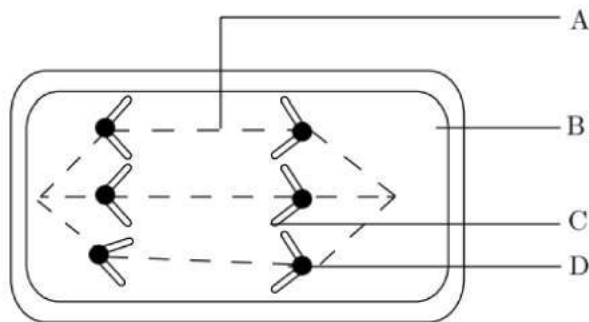
(b) Draw a neat labelled diagram of the cell as it would appear in the next stage. Name the stage.

**Answer:** (a) Prophase Reason – Nuclear membrane is disappearing.

(b)



**(iii) The diagram represents a stage in cell division. Study the same and answer the questions that follow:**



- (a) Identify the stage of cell division.
- (b) Name the parts labelled A, B, C and D.

**Answer:**

- (a) Anaphase
- (b) (i) Centromere
- (ii) Cell wall
- (iii) Spindle fibre
- (iv) Chromatid

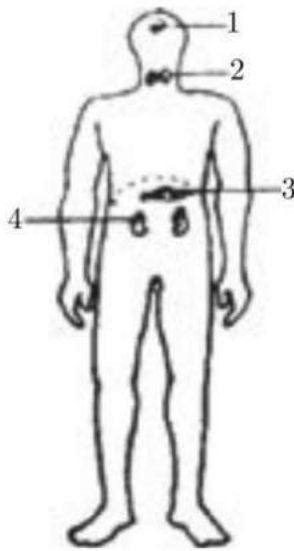
**(iv) What are the factors affecting transpiration ?**

**Answer:** The factor that affect transpiration are:

- (i) Temperature
- (ii) Humidity
- (iii) Light intensity
- (iv) Soil moisture
- (v) Air movement

**(v) Given below is the outline of the human body showing the important glands :**

- (a) Name the glands marked 1 to 4.
- (b) Name the hormone secreted by part.2. Give one important function of this hormone.



**(c) Name the endocrine part of the part numbered 3.**

**Answer:** (a) Naming the glands marked 1 to 4:

Pineal Gland, Thyroid Gland, Pancreas, Adrenal Glands

**b) Hormone secreted by part 2 and its function:**

Metabolism, Growth and Development, Brain Function,

(c) Islet of Langerhans.

**QUESTION 7.**

**(i) Distinguish between a ustralopithecus and Neanderthals (period of living).**

**Answer:** Australopithecus: They lived around four million years ago. Neanderthals They lived around 500000 to 600000 years ago.

**(ii) Study the figure and answer:**



- (a) Mention the scientific name of the figure.  
(b) State its features.

**Answer:** (a) Homo Sapiens

(b) Their cranium is high, rounded with thin bones. They have small pronounced brow ridges and show bipedalism.

**(iii) Write difference between Mitral Valve and Semilunar Valve**

**Answer:**

Sr. No.	Mitral valve	Semilunar vales
1.	The valve present between the left atrium left ventricle is called mitral valve.	The valves present at the openings of right and left ventricles into the pulmonary artery and aorta are semilunar valves.
2.	It is made of two flaps.	These are of three half moon shaped cusps.

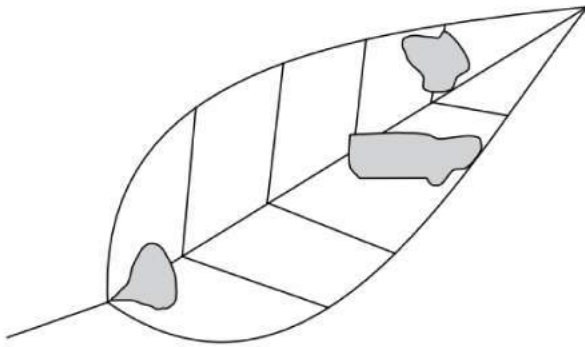
**(iv) Rapid rise of population demands the use of non-conventional use of energy. Comment.**

**Answer:** The rapid rise in population has led to a surge in energy demand, putting immense pressure on conventional energy sources like fossil fuels.

These sources are not only depleting rapidly but also contribute significantly to environmental pollution and climate change. Non-conventional energy sources, such as solar, wind, hydro, and geothermal, offer a sustainable and environmentally friendly alternative. They are abundant, renewable, and have minimal impact on the environment. By embracing these sources, we can meet the growing energy needs of our population while ensuring a healthier and more sustainable future for generations to come.

**(v) Ravi is studying a diagram that shows an experiment involving a leaf. Based on his observations, answer the following questions:**





- (a) Identify the experiment to be performed with this leaf.  
(b) What will you observe if starch test is performed on this leaf.  
(c) What does the experiment signify?

**Answer:** (a) The leaf given above is used to prove that the chlorophyll is necessary for photosynthesis.

**(b) Starch:**

1. Starch is a polysaccharide made up of multiple monomers of glucose.
2. Starch is produced by plants during the process of photosynthesis.
3. Hence, starch is stored inside plant leaves.
4. The process to test the presence of leaves is explained below.

(c) The experiment proves that photosynthesis can occur only in the presence of chlorophyll.

**QUESTION 8.**

**(i) What is flaccid condition of a cell?**

**Answer:** A flaccid cell is a cell that has lost its turgor pressure, meaning it is not firm or rigid. This occurs when the cell loses water, causing its contents to shrink and the cell membrane to pull away from the cell wall. In plant cells, this can lead to wilting.

**(ii) Write down the difference between Cerebrum and Spinal cord.  
(Arrangement of nerve cells).**

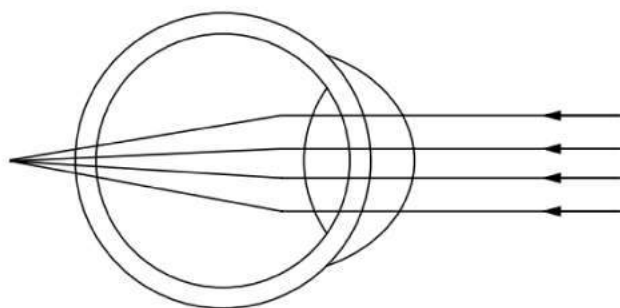
**Answer:**

1. **Cerebrum:** The largest anatomical region of the human forebrain containing the highest neural centers of the nervous system is called the cerebrum.

2. **Spinal cord:** The cylindrical part of the central neuron system originates from the lower part of the medulla oblongata and is present within the cerebral canal extending from the foramen magnum up to the first or second lumbar vertebra is called the is the **spinal cord**.

Cerebrum	Spinal cord
i. Grey matter (cell bodies of neurons) is present on the surface of the cerebrum.	i. Grey matter (all bodies of neurons) is present in the central part of the spinal cord.
ii. White matter (axons of neurons) is present just beneath the grey matter of the cerebrum.	ii. In the spinal cord white matter (axons of neurons) envelops the grey matter.

(iii) The diagram given below represents a defect of vision of the human eye :



- (a) Mention two causes for the defect.  
 (b) How can this defect be rectified ?
- Answer:** (a) (i) The lens is flattened.  
 (ii) The eye ball is shortened from front to back.  
 (b) This defect can be rectified by biconvex lens.

(iv) **Why the use of CFCs should be banned?**

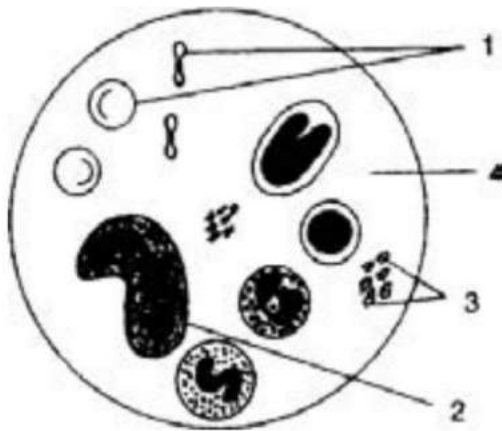
**Answer: CFCs:** CFCs are gases that are utilised in products such as aerosols and refrigerators, and they can harm the ozone layer. The term "CFC" stands for "chlorofluorocarbon."

**CFC is banned in many countries:**

1. Many countries prohibit the use of CFC because it degrades to chlorine atoms, which then degrades or thins the ozone layer.

2. Thinning of the ozone layer allows dangerous UV radiation to enter the earth and cause sunburn/genetic disorders/skin cancer/affecting forest and marine production.

**(v) Given below is a diagram of a smear of human blood. Study the same and then answer the questions that follow:**



- (a) Name the parts 1, 2, 3 and 4 indicated by guidelines.  
(b) Mention structural differences between the parts labelled '1' and '2'.  
(c) What is the main function of the parts labelled 1 and 3?

**Answer:** (a) 1. RBC, 2. WBC, 3. Platelets, 4. Plasma.

(b)

	RBC		WBC
(1)	Non-nucleated	(1)	Nucleated

- (c) (i) Transport oxygen to all parts of the body.  
(ii) Clotting of blood.