ICSE 2025 EXAMINATION

Sample Question Paper - 7

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) Cell wall is .....

(a) Semi-permeable (b) Selectively permeable
(c) Impermeable (d) Freely permeable

Answer: (d) Freely permeable

(ii) Loss of water as droplets from hydathodes is called

(a) Transpiration (b) Bleeding
(c) Guttation (d) Evaporation

Answer: (c) Guttation

(iii) Assertion (A): Aqueous humour is present between the cornea and lens.
Reason (R): Aqueous humour helps maintain intraocular pressure and provides nutrients to the lens and cornea.

(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) Neha was learning about blood vessels and their functions. She made the following table:

Blood Vessel	Function
P	Carries oxygenated blood away from the heart.
Q	Carries deoxygenated blood toward the heart.

Identify the correct pair.

(a) P – Arteries, Q – Veins
(b) P – Veins, Q – Arteries
(c) P – Capillaries, Q – Arteries
(d) P – Veins, Q – Capillaries

Answer: (a) P – Arteries, Q – Veins

(v) Bicuspid and tricuspid valves are closed during
(a) ventricular diastole (b) ventricular systole
(c) atrial systole (d) late joint diastole

Answer: (b) ventricular systole

(vi) When the environmental resistance is negligible and there is plenty of food and space, the population would show
(a) Zero growth curve (b) J-shaped growth curve
(c) Sigmoid growth curve (d) none of the above

Answer: (b) J-shaped growth curve

(vii) Assertion (A): In human beings, egg contains both X-chromosomes.
Reason (R): In human beings, females are homogametic.

(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 Reason is true.

Answer: (a) Both Assertion and Reason are true.

(viii) The thin membranous sac serving as the reservoir of urine is

(a) ureter (b) urinary bladder
(c) glomerulus (d) kidney

Answer: (b) urinary bladder

(ix) The deficiency of ADH causes :

(a) diabetes insipidus (b) diabetes mallitus
(c) dwarfism (d) acromegaly

Answer: (a) diabetes insipidus

(x) Assertion (A): The left ventricle has the thickest wall in the heart.
Reason (R): The left ventricle needs to pump oxygenated blood to all parts of the body, requiring a stronger contraction and thicker muscular wall.

(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).

(xi) Ravi is studying cell division and observes a stage where daughter chromosomes start moving toward the poles of the spindle. The stage in which daughter chromosomes move toward the poles of the spindle is:

(a) Anaphase (b) MetaPhase
(c) Prophase (d) TeloPhase

Answer: (a) Anaphase

(xii) Assertion (A): Auxins are abundantly produced in the meristematic region of the shoot.
Reason (R): Auxins are responsible for promoting cell elongation, particularly in the growing tips of plants.

(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).

(xiii) A teacher asked her students to name two organs involved in human reproduction.
Raj said: Ovaries and Uterus
Sonu said: Testes and Pancreas
Lata said: Uterus and Fallopian tubes
Abhay said: Liver and Ovaries

Who were correct?
(a) Raj and Lata
(b) Sonu and Abhay
(c) Raj and Sonu
(d) Lata and Abhay

Answer: (a) Raj and Lata

(xiv) At which stage in mitosis and meiosis do chromosomes always line up at the equator of the spindle?
(a) Prophase
(b) Telophase
(c) Anaphase
(d) Metaphase

Answer: (d) Metaphase

(xv) How many times a red blood corpuscle will have to pass through the heart in its journey from hepatic artery to the aorta ?
(a) only once
(b) two times
(c) several times
(d) four times

Answer: (b) two times

QUESTION 2.
(i) Name the following

(a) Main excretory organ in man.
(b) Movement of molecules from a region of high concentration to a region of low concentration.
(c) One genetic disease.
(d) The gland that regulates calcium in blood.
(e) Wave of electrical disturbance that sweeps over the nerve cell.

Answer: (a) Kidneys
(b) Diffusion

(c) Haemophilia
(d) Parathyroid gland
(e) Nerve impulse

(ii) Fill in the blanks with suitable words.
The inner ear or (a) ..... has two main parts (b) ..... and (c) ..... The cochlea is (d) ..... and look like a (e) ..... .

Answer: (a) membranous labyrinth
(b) cochlea
(c) semicircular canals
(d) spiral-shaped
(e) snail shell

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

(a) Cell wall, Nucleus, Nucleoplasm, Cell membrane, Cytoplasm
(b) Australopithecus, Homo erectus, Cro-Magnon, Homo habilis, Homo sapiens sapiens
(c) Head, Pulmonary artery, Right ventricle, Right auricle, Superior vena cava
(d) Menstrual phase, Luteal phase Ovulatory phase, Follicular phase
(e) Gamete formation, Zygote, Fertilisation, Embryo

Answer:

(a) Cell membrane, Cytoplasm, Nucleus, Nucleoplasm, Cell wall

(b) Australopithecus, Homo habilis, Homo erectus, Cro-Magnon, Homo sapiens sapiens

(c) Superior vena cava, Right auricle, Right ventricle, Pulmonary artery, Head

(d) Menstrual phase, Follicular phase, Ovulatory phase, Luteal phase

(e) Gamete formation, Fertilisation, Zygote, Embryo

(iv) Read the explanations given below and name the structure:
Example: The organ responsible for filtering blood and producing urine.
Answer: Kidneys.

(a) The blood vessels that carry oxygenated blood to the body.
(b) The process of breaking down glucose to release energy in cells.
(c) The organ in plants responsible for reproduction.

(d) The type of blood vessels that exchange nutrients and waste between tissues and blood.
(e) The cells in the human body that fight infections.

Answer:

(a) Arteries
(b) Cellular respiration
(c) Flower
(d) Capillaries
(e) White blood cells

(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.	Junction between neuron	1.	Testosterone
B.	Luteal phase	2.	Synapse
C.	Auditory nerve	3.	Cranial meninges
D.	Protective covering Progesterone of brain	4.	Progesterone
E.	Occiptall	5.	Visual perception
		6.	Ears

Answer:

	Column I		Column II
A.	Junction between neuron	2.	Synapse
B.	Luteal phase	4.	Progesterone
C.	Auditory nerve	6.	Ears
D.	Protective covering Progesterone of brain	3.	Craninal meninges
E.	Occiptal lobe	5.	Visual perception

SECTION – B

(Attempt any four questions.)

QUESTION 3.

(i) Write the names of four nitrogenous bases in a DNA molecule.

Answer: The four nitrogenous bases in a DNA molecule are:

1) Adenine (A)
2) Guanine (G)
3) Cytosine (C)
4) Thymine (T)

(ii) Why did Mendel select garden pea for his experiment on genetics?

Answer: Mendel selected pea plants for his experiment because of the following reasons:

1. A pea plant has many contrasting characters.

2. Self-fertilization takes place in pea plants and so it is possible to get a pure line of traits.

3. Flowers are bisexual and hermaphrodite. Therefore, cross-pollination is achieved easily.

(iii) What is a SAT chromosome?

Answer: SAT-chromosome:

1. The terminal part of a chromosome may bear a round structure called a satellite, which remains separated from the rest of the chromosomes by a constriction. Such a chromosome is called SAT-chromosome.

2. A human being has 23 pairs (46 individually) of chromosomes in a single cell.

3. Human chromosome numbers 21 and 22 are examples of SAT- chromosomes:

(iv) (a) State Mendel's law of dominance.
(b) State Mendel's law of segregation.

Answer: Mendel's Law of Dominance:

1. When a pair of contrasting alleles are present in the same generation, only one of them expresses itself.

2. The dominant allele is the one that expresses itself, while the recessive allele is the one that does not.

Mendel's law of segregation:

Law of Segregation or the law of purity of gametes: The two members of a pair of factors separate during the formation of gametes. They do not blend but segregate

or separate into different gametes. The gametes combine together by random fusion at the time of zygote formation.

(v) Define the following :

a) Genome
b) Alleles
c) Punnett square

Answer:

a) Genome: It is a complete copy of genetic information (DNA) or one complete set of chromosomes (monoploid or haploid) of an organism.

b) Alleles: An allele is one of two or more versions of a gene that can exist at a specific location (locus) on a chromosome. Different alleles can result in different observable traits, such as different eye colors or blood types.

C) Punnett square:

1. A diagram that represents the possible genotypes of offspring, developed after the event of breeding.

2. It was first developed by geneticist Reginald Punnette.

3. The possible genotypes of offspring are represented in tabular form.

4. Each box in the table represents one event of fertilization.

5. Each allele in every Punnett square is represented by the first letter of the dominant phenotype

QUESTION 4.

(i) What is colostrums ?

Answer: Colostrum:

1. Colostrum is the primary milk that is secreted by the mammary glands after childbirth.
2. Colostrum is called bee stings or the first milk produced by the mother.
3. The necessary elements, fat, and protein are present in colostrum.
4. Since it contains high antibodies, it is protective for the newborn.

5. The colostrum contains immune cells and many antibodies, cytokines, and other factors which help the newborn to adapt well to the existing surroundings.

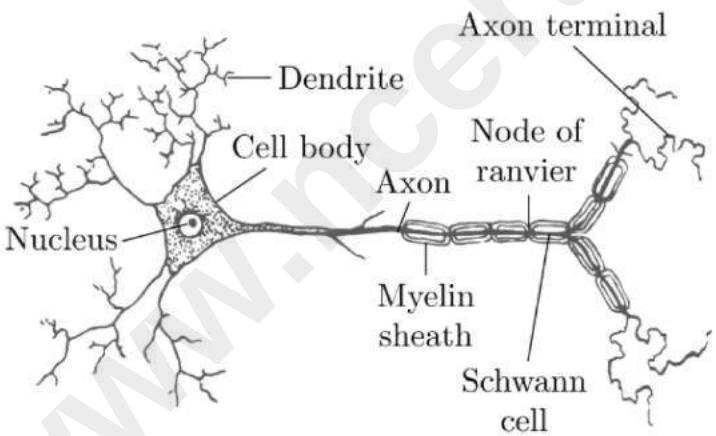
(ii) State the role of testosterone

Answer: Testosterone:

1. Testosterone is a sex hormone that plays important role in the male reproductive system.
2. Testosterone is an androgen that are produced in the testes.
3. It is responsible for the development of male accessory sex organs, muscular growth, and secondary sexual characters.
4. It regulates spermatogenesis and libido in males.
5. They also regulate bone mass, fat distribution, muscle mass, and strength.

(iii) Draw a labelled diagram of a myelinated neuron.

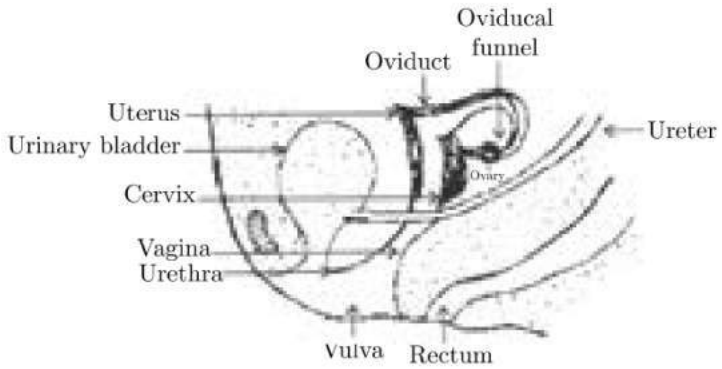
Answer: A myelinated neuron diagram is given below



(iv) What is the significance of human testis being located in the scrotum?

Answer: Scrotum protects the testis. It also regulates the temperature of the testis. Sperms need a temperature less than the body temperature for their production and development.

(v) Ramesh was studying a diagram of the female reproductive system in his biology class. His teacher asked him to identify specific parts of the system.



(a) Name the fully developed part of ovary containing the ovum.
(b) Name the organ of the female body in which the foetus develops.
(c) Name the part homologous to penis of male.

Answer:

(a) Graafian follicle
(b) Uterus
(c) Clitoris

QUESTION 5.

(i) How does the raw materials reach the plant cell?

Answer: The following raw materials are required for photosynthesis:

- Carbon Dioxide: Plants get CO_2 from atmosphere through stomata.
- Water: Plants absorb water from soil through roots and transport to leaves.
- Sunlight: Sunlight, which is absorbed by the chlorophyll and other green parts of the plant.

(ii) Give one example of osmosis occurring in human body and a green leaf

Answer: Osmosis occurs in the human body when water moves from the intestines into the bloodstream,

absorbing essential nutrients. [1] In a green leaf, osmosis helps in the uptake of water from the soil into the plant cells, aiding in photosynthesis and overall plant growth.

(iii) Mention three advantages of transpiration.

Answer: Three advantages of transpiration are as follows:
(a) It provides a suction force.

(b) It produces a cooling effect.
(c) It helps in the distribution of water throughout the plant.

(iv) Give scientific reasons:

(a) It is not possible to demonstrate respiration in green plants in daytime.
(b) Some leaves have shiny and green upper surface.

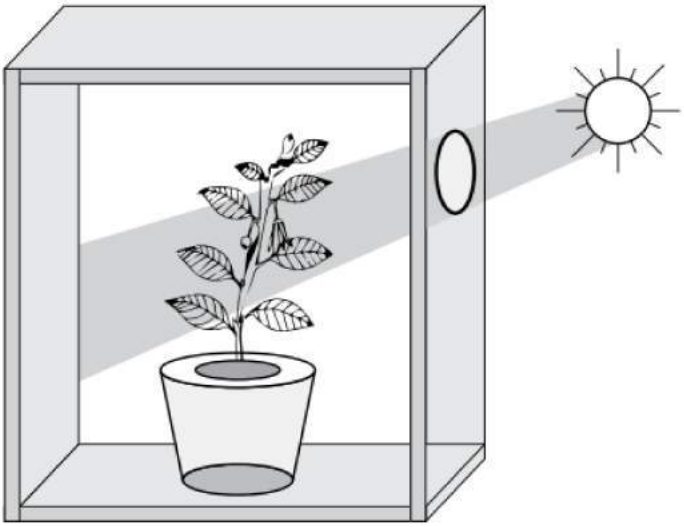
Answer:

(a) It is not possible to demonstrate respiration in green plants in daytime because during daylight, photosynthesis, which consumes carbon dioxide, occurs simultaneously with respiration, which releases carbon dioxide. As a result, the carbon dioxide released during respiration is immediately used up by photosynthesis, making it difficult to detect the release of carbon dioxide, a hallmark of respiration.

(b) Some leaves have shiny and green upper surfaces due to the presence of a waxy cuticle on the upper epidermis. This cuticle helps to reduce water loss through transpiration. Additionally, the upper surface of the leaf is typically more exposed to sunlight, and the shiny surface can reflect some of the sunlight, helping to prevent overheating of the leaf. The green color of the upper surface is due to the presence of chlorophyll, the pigment responsible for photosynthesis. Chlorophyll absorbs sunlight and uses its energy to convert carbon dioxide and water into glucose, the plant's food.

(v) Study the figure and answer the following.

(a) What is depicted in the figure?



(b) Define the process.

(c) How does the plant move towards the light?

Answer: (a) Phototropism.
(b) The movement of shoots towards light.
(c) This is due to the synthesis of auxin hormone at the shoot tip. In the presence of light, auxin accumulate on the shaded part of the stem causes growth on one side causing a curvature towards the lighted side.

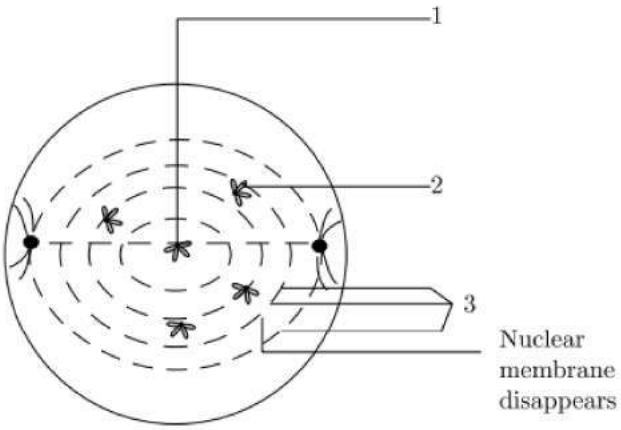
QUESTION 6.

(i) What are the two main defects of eye ?

Answer: Myopia (nearsightedness) and Hyperopia (farsightedness)

(ii) Given is a diagram representing a stage during mitotic cell division in an animal cell.

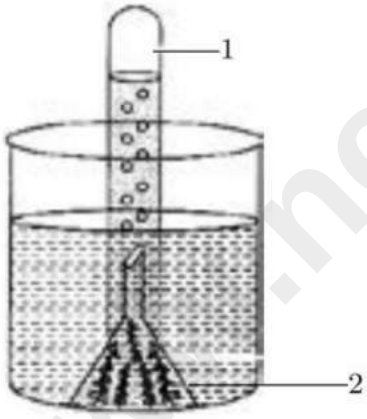
a) Identify the stage. Give a reason to support your answer.
b) Name the cell organelle that forms the aster.



Prophase

Answer: (a) Late prophase. The reason is that nuclear membrane disappears.
(b) Centrosome (centrioles).

(iii) The following diagram demonstrates a physiological process taking place in green plants. The whole set up was placed in bright sunlight for several hours. Study the diagram and answer the questions that follow :



(a) What aspect of the physiological process is being examined?
(b) Explain the physiological process mentioned in (a) above.

Answer: (a) Oxygen is evolved during photosynthesis in green plants.

(b) Photosynthesis is a physiological process during which green plants synthesize complex organic compounds (Glucose) from simple inorganic compounds -CO_2, and H_2O in the presence of sunlight and chlorophyll.

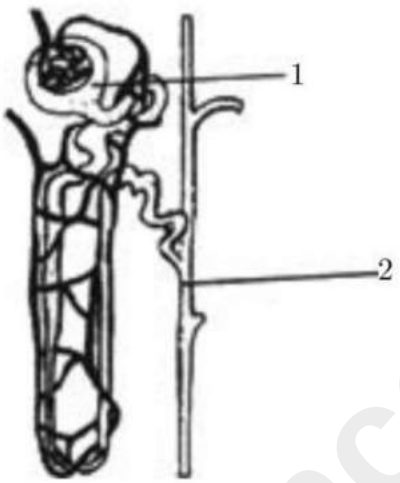
(iv) State any two reasons for selecting garden pea by Gregor Johann Mendel for his experiments.

Answer: Two reasons for selecting garden pea by Gregor Mendel for his experiments are:
(a) Peas are self-pollinated since it is bisexual.
(b) Reproductive span of pea plant is small.

(v) The diagram given below is that of a structure present in a human kidney

Study the same and answer the questions that follow:

(a) Name the structure represented in the diagram.



Answer: (a) Nephron/Uriniferous tubule

(b) What is the liquid entering part 1 called ?

Answer: (b) Glomerular filtrate.

(c) What is the fluid that comes to part '2' called ? Name the main nitrogenous waste in it.

Answer: (c) Urine; Urea

QUESTION 7.

(i) Who wrote Origin of species?

Answer: Charles Darwin

(ii) The figure shows a human ancestor. Study it and answer the following.

(a) Identify the figure.

(b) Mention the structures that support bipedalism.

Answer: (a) Cro-Magnon.

(b) Location of foramen magnum and curvature of the spine support bipedalism.

(iii) How does lymph flow?

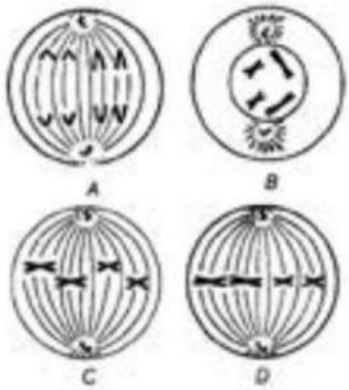
Answer: Lymph flows towards the heart from lymph capillaries into lymphatic vessels and into a lymphatic duct which opens into a larger vein near the heart.

(iv) The need to limit the size of the family is more vital today than ever. Give two reasons.

Answer: –Smaller families are typically more financially stable due to fewer expenses and shared resources.

– A smaller family unit is easier to manage and requires less time and energy to care for. This leaves more time for parents to devote to other important aspects of their lives.

(v) Given below diagrams are showing four stages A, B, C and D of a certain kind of cell division. Answer the following questions.



(a) Is it a plant cell or an animal cell? Give reason.
(b) Is it undergoing mitosis or meiosis?
(c) What would be the correct sequence of these stages?

Answer: (a) The given figure is of an animal cell, because it contains a contains and centrosome, which form spindle fibres. Secondly, a cell wall is also absent.

(b) The given animal cell is undergoing mitosis.

(c) The correct sequence of these stages would be

B→ C→ D→ A.

QUESTION 8.

(i) Explain the term root pressure.

Answer: The pressure in plants helps to drive fluids upward into the water-conducting vessels (xylem).

Root pressure is osmotic pressure within the cells of a root system that causes sap to rise through a plant stem to the leaves. Root pressure occurs in the xylem of some vascular plants when the soil moisture level is high either at night or when transpiration is low during the day.

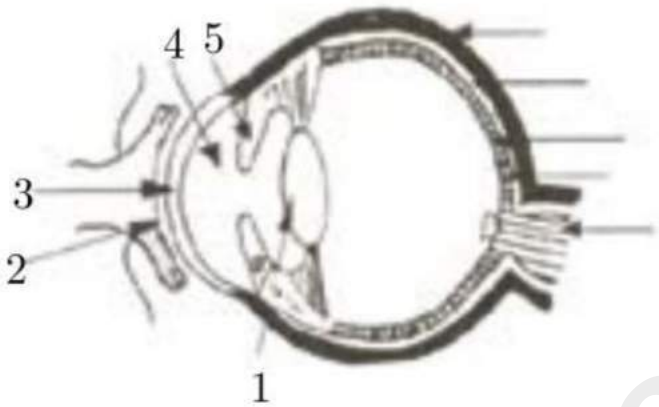
(ii) Define Synapse.

Answer: **Synapse Definition –** Synapse is a junction between two neurons or a neuron and a target or effector cell such as a muscle cell. It permits the transmission of electrical or chemical signals.

The synapse is formed between presynaptic and postsynaptic neurons. It is known as the neuromuscular junction between a neuron and muscle.

The conduction of nerve impulses from an axon terminal of a neuron to dendrites of the next neuron occurs through a synapse. It can be electrical or chemical.

(iii) The diagram given below refers to the vertical section of the eye of a mammal. Label the parts 1 to 4 to which the guidelines point.



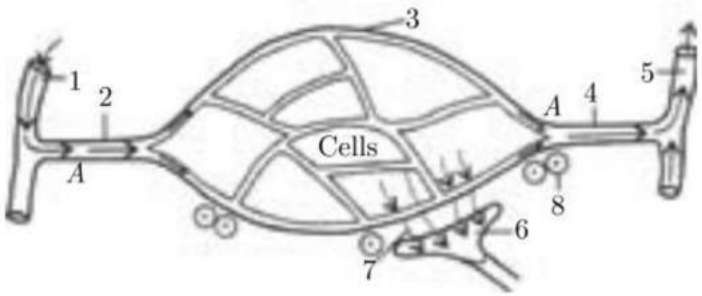
Answer: 1. Aqueous humor
2. Lens
3. Iris
4. Cornea

(iv) Explain the term greenhouse effect

Answer: The greenhouse effect is a natural process that helps keep Earth's temperature suitable for life. Here's how it works:

1. Sun's Energy: The sun sends out energy in the form of light and heat.
2. Earth's Atmosphere: Some of this energy reaches Earth's surface, while some is reflected back into space. The rest is absorbed by the atmosphere.
3. Greenhouse Gases: Certain gases in the atmosphere, like carbon dioxide, methane, and water vapor, trap some of this heat. They act like a blanket, keeping the Earth warm.
4. Temperature Regulation: This trapped heat warms the Earth's surface and keeps it at a comfortable temperature. Without this natural greenhouse effect, Earth would be much colder.

(v) Given below is a diagrammatic sketch of blood vessels:



(a) Label the parts 1 to 5.
(b) What is the difference in the quality of blood contained in 1 and 5 ?
(c) Name any one important component of the blood which remains inside the capillary and fails to move out into the spaces.

Answer:

(a) 1 Artery; 2 - Arteriole; 3 - Capillary; 4 Venule; 5 - Vein;
(b) Artery contains oxygenated blood while Vein contains deoxygenated blood.
(c) RBC.