

# ICSE 2025 EXAMINATION

## Sample Question Paper - 10

### BIOLOGY

Time: 2 hrs.

Total Marks: 80

#### General Instructions:

1. Answers to this paper must be written on the paper provided separately.
2. You will be not 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.

**Section A** is compulsory. Attempt any **four questions** from **Section B**.  
The intended marks for questions or parts of questions are given in brackets [ ]

#### SECTION A

(Attempt all questions from this Section.)

#### Question 1

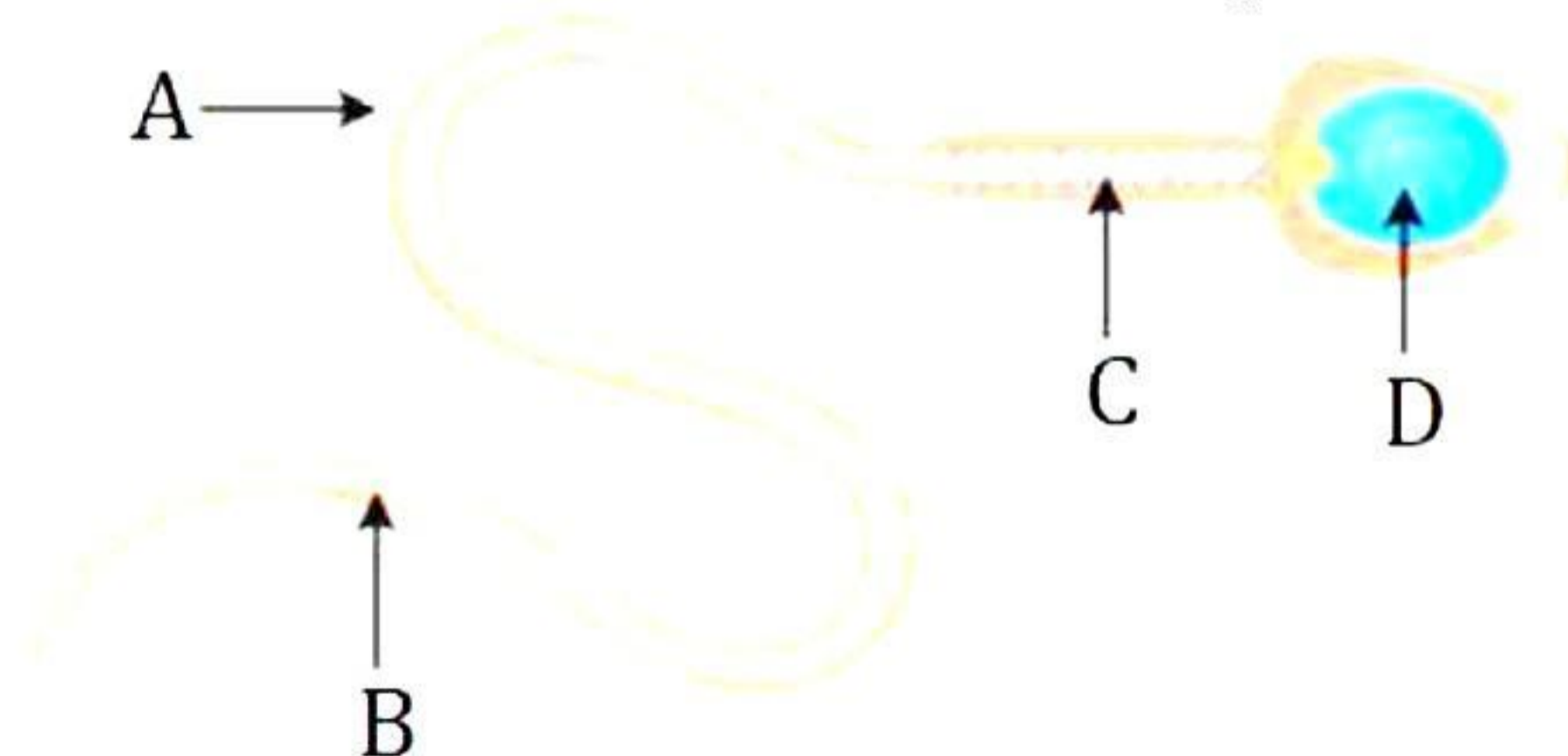
Choose the correct answers to the questions from the given options.

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

[15]

- (i) The blood vessel leaving the left ventricle of the mammalian heart is the
1. Portal vein
  2. Hepatic vein
  3. Pulmonary vein
  4. Aorta

- (ii) Given below is the structure of human sperm.



In which part of the sperm will you find mitochondria?

1. Part A
2. Part B
3. Part C
4. Part D

(iii) The first stable product formed during carbon dioxide fixation is

1. Glucose
2. Hexose-3-phosphate
3. PGA
4. PEP

(iv) Duplicated chromosomes are joined at a point termed as

1. Centrosome
2. Centromere
3. Centriole
4. Chromatid

(v) There is an overgrowth of the adrenal cortex in Sushama's body. She developed a beard, moustache, and a deep male voice. Which condition is Sushama suffering from?

1. Addison's disease
2. Cushing's syndrome
3. Adrenal virilism
4. Acromegaly

(vi) **Assertion (A)** The optimum temperature at which maximum photosynthesis occurs is 35°C.

**Reason (R):** The rate of photosynthesis continues to rise with a rise in temperature above 35°C.

1. Both A and R are true
2. Both A and R are false
3. A is true and R is false
4. A is false and R is true

(vii) Euro Bharat norms have been laid down by the Central Government.

In view of these norms, few statements are given below.

- I. These norms aim to effectively cut down sulphur and nitrogen oxides from automobile exhausts.
- II. These norms focus on the recycling of plastic, metal, and glass materials.
- III. The emission standards have been set to check on the pollutant levels emitted by the vehicles that use combustion engines.
- IV. The goal of these norms is to make an Open Defecation Free (ODF) India.

Which of these statements form the basis of Euro Bharat norms?

1. I, II
2. II, III
3. I, III
4. I, IV

(viii) The part that is cut in tubectomy is the

1. Urethra
2. Oviduct
3. Vas deferens
4. Uterus

(ix) **Assertion (A):** Blind spot is the region of brightest and colourful vision.

**Reason (R):** It contains the maximum sensory cells particularly the cones.

1. Both A and R are true
2. Both A and R are false
3. A is true and R is false
4. A is false and R is true

(x) Industrial melanism was highlighted by the

1. Polar bear
2. Butterfly
3. Peppered moth
4. Finches

(xi) Twining of tendrils around a support is an example of

1. Geotropism
2. Thigmotropism
3. Phototropism
4. Chemotropism

(xii) Olfactory lobes are a part of the

1. Forebrain
2. Midbrain
3. Hindbrain
4. Spinal cord

(xiii) **Assertion (A):** Leaves of balsam plant wilt in the evening and recover during mid-day.

**Reason (R):** Transpiration is more during mid-day and less in the evening.

1. Both A and R are true
2. Both A and R are false
3. A is true and R is false
4. A is false and R is true

(xiv) Marine fish when thrown under tap water burst because of

1. Endosmosis
2. Exosmosis
3. Diffusion
4. Plasmolysis

(xv) **Assertion (A):** If a pure tall plant is crossed with a pure dwarf plant, the progeny obtained in the F<sub>1</sub> generation will be dwarf.

**Reason (R):** Tallness is the dominant character while dwarfness is the recessive character.

1. Both A and R are true
2. Both A and R are false
3. A is true and R is false
4. A is false and R is true

## Question 2

(i) **Name the following:**

[5]

- (a) Phase of the cell cycle in which chromosomes appear thread-like.
- (b) Resting stage of mitosis.
- (c) Gland which has both endocrine and exocrine function.
- (d) Gas which reduces the oxygen-carrying capacity of blood.
- (e) Part of the chloroplast where photophosphorylation occurs.

(ii) **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.**

[5]

- (a) Photons, Hydroxyl ions, Oxygen, Water molecules
- (b) Sclera, Retina, Fovea, Choroid
- (c) Pulmonary artery, Pulmonary veins, Aorta, Lungs
- (d) Zygote, Foetus, Morula, Blastocyst
- (e) Ovulation, Implantation, Gestation, Fertilisation

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

[5]

Column I	Column II
(a) Amniotic fluid	1. Cell division
(b) Auxins	2. Protection
(c) Light reaction	3. Ripening of fruits
(d) Seminal fluid	4. Grana
(e) Dark reaction	5. Epidermis
	6. Nourishment
	7. Stroma

**(iv) Choose the odd one out from the following terms and name the category to which the others belong:** [5]

- (a) Vasopressin, Growth hormone, TSH, ACTH
- (b) Vas deferens, Penis, Uterus, Seminal vesicles
- (c) Corpus luteum, Corpus callosum, Pons, Cerebellum
- (d) Anus, Vermiform appendix, Wisdom teeth, Ear pinna
- (e) Haemophilia, Colour blindness, Muscular dystrophy, Hypertrichosis of pinna

**(v) State the exact location of the following structures.** [5]

- (a) Loop of Henle
- (b) Pineal gland
- (c) Testes
- (d) Chordae tendinae
- (e) Eustachian tube

## SECTION B

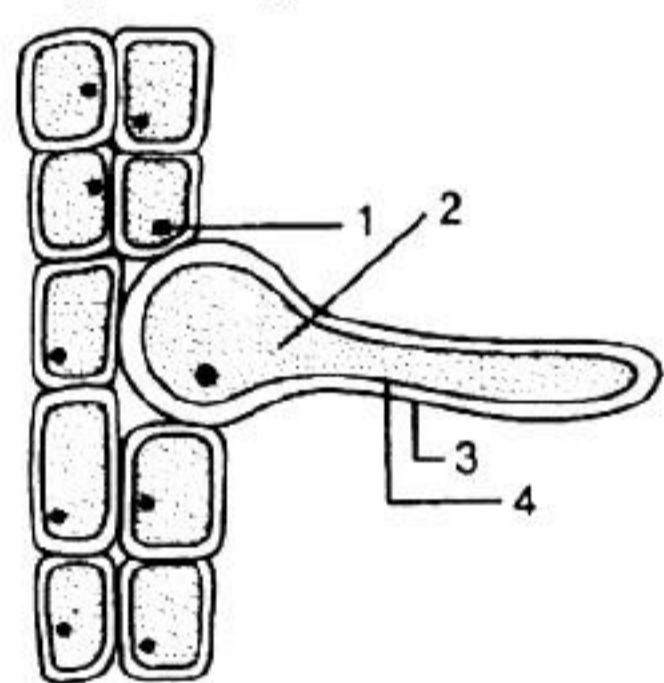
*(Attempt any four questions from this section.)*

### Question 3

- (i) How does warm water act as a pollutant? [1]
- (ii) There is a pressing need for adopting population control measures. Give reason. [2]
- (iii) List two functions of the amnion. [2]
- (iv) Differentiate between the following pairs based on what is mentioned in the brackets: [2]
  - (a) Natality and Mortality (Definition)
  - (b) Acromegaly and Cretinism (Symptoms)
- (v) 'Urine is formed from alkaline blood, but it is acidic in nature'. Comment. [3]

### Question 4

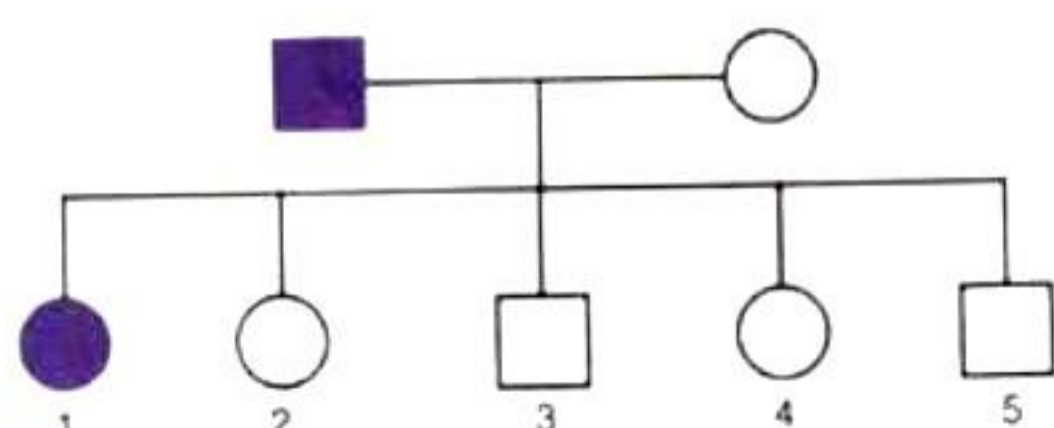
- (i) State the functions of the ureters and the urethra. [1]
- (ii) What is a gene? How is it related to heredity? [2]
- (iii) The figure given below shows a root hair. [2]



- (a) Label the parts 1 to 4.
- (b) What is the role of part 4?
- (iv) How do non-green plants such as fungi and bacteria obtain their nourishment? [2]
- (v) Draw neat and labelled diagrams showing the cross-sections of an artery and a vein. [3]

### Question 5

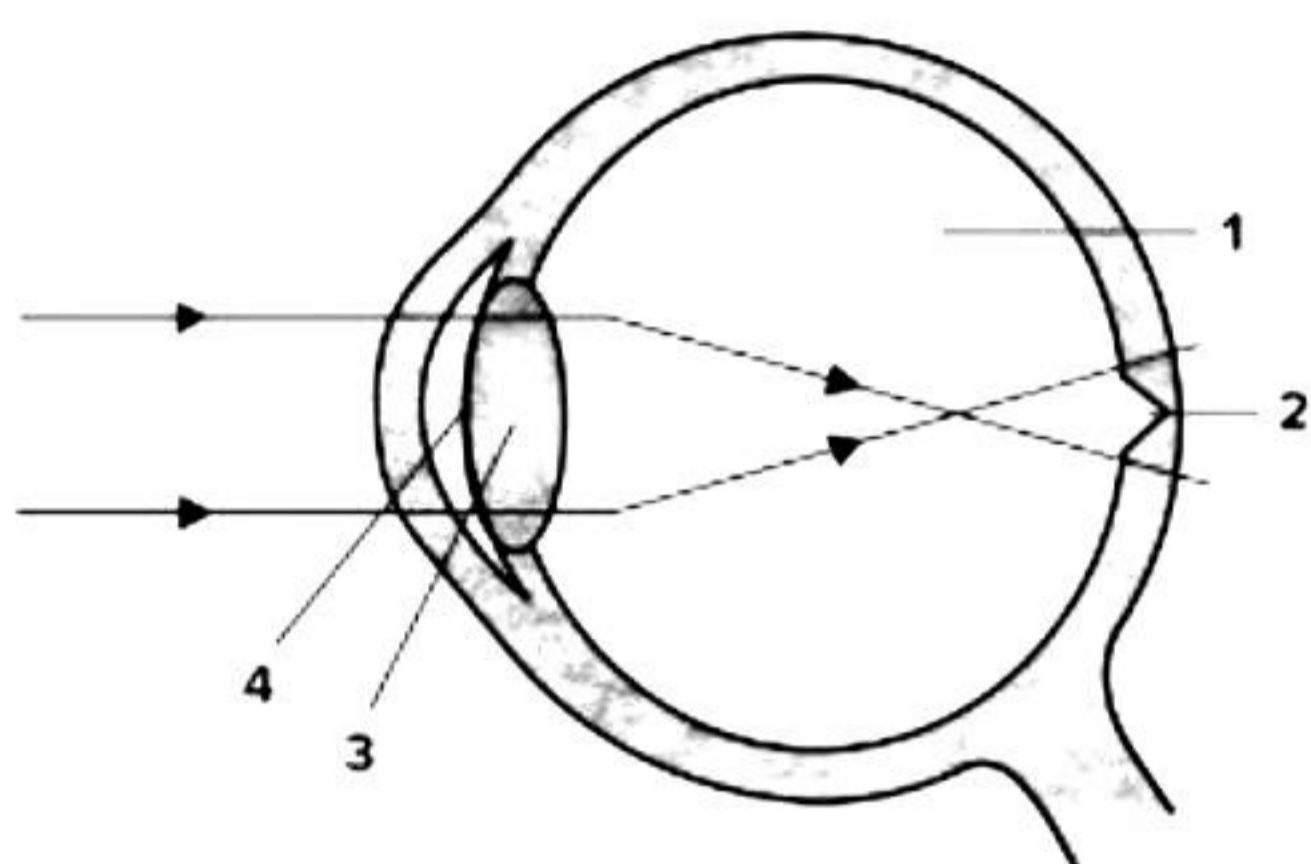
- (i) Define pollution. [1]
- (ii) What is parthenocarpy? Give one example. [2]
- (iii) Addition of salt to pickles prevents the growth of bacteria. Explain by giving two suitable reasons. [2]
- (iv) Oxygen given out during photosynthesis comes from water. Explain this statement. [2]
- (v) A family consists of two parents and their five children, and the pedigree chart shown below shows the inheritance of the trait colour blindness in them. [3]



- (a) What does child 1 indicate about this trait?
- (b) On which chromosome is the gene of this trait located?
- (c) Name one more trait in humans which follows a similar pattern of inheritance.

### Question 6

- (i) State one important function of chloroplast. [1]
- (ii) State two functions of auxins. [2]
- (iii) Can the blood clot inside the blood vessels? Give reason in support of your answer. [2]
- (iv) Write about the excretory role of the lungs. [2]
- (v) Given below is a diagram depicting a defect of the human eye. Study the same and then answer the questions that follow: [3]



- (a) Identify the defect.
- (b) Label the parts 1-4.
- (c) Name the type of lens used to correct this eye defect.

### Question 7

- (i) A person after consuming alcohol walks clumsily. Give reason. [1]
- (ii) How is mitosis in animals different from mitosis in plants? [2]
- (iii) Why do plants absorb more water than is required by them? [2]
- (iv) Our hair stands on its ends during scary situations. Give reason. [2]
- (v) How is prophase-I of meiosis different from prophase of mitosis in an essential way? Describe how it affects the daughter cells. [3]

### Question 8

- (i) What are tropic hormones? [1]
- (ii) List two characteristic features of the Neanderthal man. [2]
- (iii) Plants droop on a hot day even though the soil is well-watered. Explain. [2]
- (iv) List any two measures to minimise noise pollution. [2]
- (v) Draw a labelled diagram of a myelinated neuron. [3]

# Solution

---

## SECTION A

### Solution 1

- (i) Aorta
- (ii) Part C
- (iii) PGA
- (iv) Centromere
- (v) Adrenal virilism
- (vi) A is true and R is false
- (vii) I, III
- (viii) Oviduct
- (ix) Both A and R are false
- (x) Peppered moth
- (xi) Thigmotropism
- (xii) Forebrain
- (xiii) A is false and R is true
- (xiv) Endosmosis
- (xv) A is false and R is true

### Solution 2

#### (i)

- (a) Telophase
- (b) Interphase
- (c) Pancreas
- (d) Carbon monoxide
- (e) Thylakoid/Grana

#### (ii)

- (a) Photons, Water molecules, Hydroxyl ions, Oxygen
- (b) Sclera, Choroid, Retina, Fovea
- (c) Pulmonary artery, Lungs, Pulmonary veins, Aorta
- (d) Zygote, Morula, Blastocyst, Foetus
- (e) Ovulation, Fertilisation, Implantation, Gestation

(iii)

Column I	Column II
(a) Amniotic fluid	2. Protection
(b) Auxins	1. Cell division
(c) Light reaction	4. Grana
(d) Seminal fluid	6. Nourishment
(e) Dark reaction	7. Stroma

(iv)

- (a) Vasopressin (Rest are hormones secreted by the anterior lobe of the pituitary)
- (b) Uterus (Rest are parts of the male reproductive system)
- (c) Corpus luteum (Rest are parts of the brain)
- (d) Anus (Rest are vestigial organs)
- (e) Hypertrichosis of pinna (Rest are X-linked disorders)

(v)

- (a) Loop of Henle: In the renal medulla
- (b) Pineal gland: Dorsal side of the forebrain
- (c) Testes: Inside the scrotum outside the abdominal cavity
- (d) Chordae tendinae: Right ventricle
- (e) Eustachian tube: Middle ear

## SECTION B

### Solution 3

- (i) Warm water released by the factories into a nearby river or a pond raises the temperature of the water, and harmfully affects the aquatic animals and the plants growing there.
- (ii) There is a pressing need for adopting population control measures because of the following reasons:
- Decrease in the per capita income
  - Depletion of natural resources like land, minerals, wood, and fuel
  - Deteriorating general health of the people
- (iii) Amnion contains the amniotic fluid which surrounds the embryo.  
Functions of the amniotic fluid: (Any two)
- This fluid protects the embryo from physical damage.
  - It maintains even pressure all around the embryo.
  - It also prevents sticking of the foetus to the amnion.

(iv)

(a) Natality and mortality (Definition)

<b>Natality</b>	<b>Mortality</b>
Natality is the number of live births per 1000 of population per year.	Mortality is the number of deaths per 1000 of population per year.

(b) Acromegaly and Cretinism (Symptoms)

<b>Acromegaly</b>	<b>Cretinism</b>
Acromegaly is caused due to hypersecretion of the growth hormone. It causes extra growth of the bones in the face, hands, and the feet.	Cretinism is caused due to hyposecretion of thyroxine. It affects the growth of the children resulting in dwarfism and mental retardation.

(v) Blood is alkaline in nature, but urine formed from blood is acidic. It is because although acidic products are continuously added to the blood, the kidneys, at the same time, perform an important function of selectively filtering out substances from the blood into the urine. This makes the urine acidic in comparison to blood alkalinity.

#### **Solution 4**

(i) Ureters carry urine from the kidneys to the urinary bladder.

Urethra carries urine from the urinary bladder to the outside of the body.

(ii) Genes are specific parts of a chromosome, which determine the hereditary characteristics. Genes are responsible for various characteristics shown externally by plants and animals. A single gene may affect one or more characteristics of the offspring.

(iii)

(a) 1 - Nucleus

2 - Vacuole

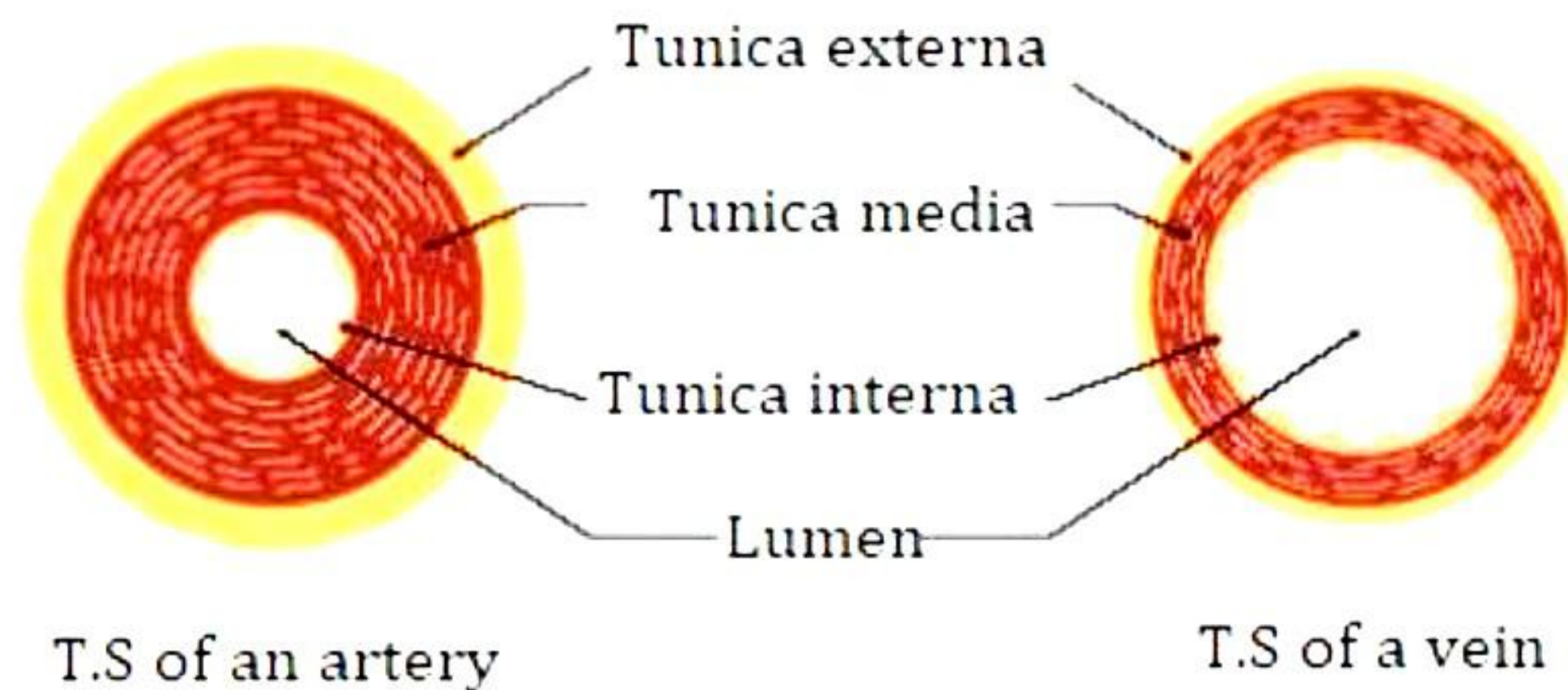
3 - Cell wall

4 - Cell membrane

(b) Cell membrane (part 4) is semi-permeable. It allows only water molecules to pass through it.

(iv) Non-green plants such as fungi and bacteria obtain their nourishment from the decaying organic matter in their environment, which comes from dead animals and plants. Thus, indirectly, they are dependent on photosynthesis for their nourishment.

(v) Cross-sections of an artery and a vein:



### **Solution 5**

- (i) Pollution is the addition of any such constituent to air, water or land which deteriorates the natural quality of the environment.
- (ii) Development of fruits without fertilisation is called parthenocarpy and the fruits are called parthenocarpic fruits. Bananas, apples, and tomatoes are some common examples of parthenocarpic fruits.
- (iii) Addition of salt to pickles increases the concentration of the surrounding medium. When bacteria come in contact with the salt, they undergo exosmosis. Water is drawn out of the bacterial cells due to which they become flaccid or plasmolysed resulting in their death.
- (iv) During the process of photolysis of water, in the presence of light, the water molecule splits up to release  $H^+$  and  $OH^-$  ions. These  $OH^-$  ions react to liberate oxygen. Thus, we can say that the oxygen liberated during photosynthesis comes from water.
- (v)
  - (a) The child 1 (daughter) is colour blind.
  - (b) X chromosome
  - (c) Haemophilia

### **Solution 6**

- (i) Chloroplast contains chlorophyll which is used to trap the solar energy from the sunlight which falls on the leaf. This energy is used during photolysis to split the water molecule into hydrogen and oxygen.
- (ii) Functions of auxins:
  - 1. Promote cell elongation
  - 2. Suppress the growth of the lateral buds

- (iii) The blood inside the blood vessels does not clot because there is no free thromboplastin enzyme available to convert inactive prothrombin into active thrombin. Also, the blood contains anticoagulants like heparin which prevent the clotting of blood.
- (iv) Lungs possess blood capillaries which absorb  $O_2$  and pass on  $CO_2$  to the alveoli by diffusion. The  $CO_2$  is then removed from the body. If retained inside the body, it may prove fatal. In this way, lungs act as excretory organs.
- (v)
- a) Myopia (short-sightedness).
  - b) 1 - Vitreous humour  
2- Retina  
3 - Lens  
4 - Pupil
  - c) Concave lens

### Solution 7

- (i) Alcohol affects the cerebellum which is the centre of body balance and co-ordination. Under the effect of alcohol, the cerebellum is unable to co-ordinate muscular movements properly. Therefore, a person after consuming alcohol walks clumsily.
- (ii) Differences between mitosis in animals and plants:

Mitosis in animals	Mitosis in plants
1. Asters are formed	1. Asters are not formed
2. Cytokinesis by furrowing of cytoplasm	2. Cytokinesis by cell plate formation
3. Occurs in most tissues throughout the body	3. Occurs mainly at the growing plant tips and sides

- (iii) Plants absorb more water than required because minerals are present in extremely small quantities in the absorbed water. To obtain a continuous supply of minerals, plants must absorb a large quantity of water.
- (iv) During scary situations, the adrenal medulla secretes the hormone adrenaline which prepares the body to face the situation by increasing the heartbeat, blood pressure and energy production. Therefore, in response to these bodily changes, our hair stands on its ends.

- (v) Prophase-I of meiosis is divided into five substages: Leptotene, Zygotene, Pachytene, Diplotene, and Diakinesis. During the pachytene stages, the genetic material is exchanged between the non-sister chromatids via crossing over and chiasma formation, which does not occur in the mitotic prophase. As a result, unlike identical daughter cells of mitosis, the daughter cells produced during meiosis exhibit a diversity in their genetic composition.

### **Solution 8**

- (i) Hormones secreted from the anterior pituitary, which stimulate certain other endocrine glands are called tropic hormones.
- (ii) Characteristic features of the Neanderthal man: *(Any two)*
1. Cranial capacity -  $1450 \text{ cm}^3$
  2. Absolute bipedalism
  3. Large head and broad-flat and sloping forehead
  4. Prominent brow ridges
  5. Less hair on the body
- (iii) On a hot day, herbaceous plants wilt even in well-watered soil because their rate of transpiration exceeds the rate of water absorption by the roots. Due to less water in the cells, the plants become flaccid, and their leaves become soft and wilt.
- (iv) Measures to minimise noise pollution: *(Any two)*
1. Use of loudspeakers should be banned.
  2. Airports should be located away from the residential areas.
  3. Blowing of horns should be prohibited.
  4. Firecrackers should not be burnt.
- (v) Myelinated neuron

