

GREENLAWNS SCHOOL, WORLI
PRELIMINARY EXAMINATION: 2024-25
BIOLOGY

Std: X

Marks: 80

Date: /01/2025

Time: 2 hrs

Answers to this paper must be written on the paper provided separately. You will **not** be allowed to write during the first **15** minutes. This time is to be spent in reading the question paper. 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**.

SECTION A

*(Attempt **all** questions from this section)*

Question 1

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

[15]

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

- (i) Scientifically, the delivery of the developed foetus is termed as:
- (a) Abortion (c) Parturition
(b) Ovulation (d) Gestation
- (ii) The picture below shows a girl with short stature and slow growth patterns compared to children of the same age. Which endocrine gland's underproduction of hormones could likely lead to this condition?



- (a) Pituitary gland
(b) Adrenal gland
(c) Pancreas
(d) None of the above
- (iii) Which part of the sperm contains enzymes that help it penetrate the egg during fertilization?
- (a) Tail (c) Nucleus
(b) Middle piece (d) Acrosome
- (iv) Which of the following statements is **NOT** true for meiosis?
- (a) The process results in genetically identical daughter cells.
(b) It involves two rounds of cell division.
(c) It produces cells with half the original chromosome number.
(d) Crossing over occurs between homologous chromosomes.
- (v) During the light-dependent reactions of photosynthesis, water molecules are split to release which two products?
- (a) Glucose and carbon dioxide (c) Carbon dioxide and glucose
(b) Hydrogen ions and Oxygen (d) ATP and NADPH

- (vi) Which of the following statements is true regarding the blood carried by the pulmonary artery and pulmonary vein?
- Both carry oxygenated blood
 - Pulmonary artery carries oxygenated blood, and pulmonary vein carries deoxygenated blood.
 - Pulmonary artery carries deoxygenated blood, and pulmonary vein carries oxygenated blood.
 - Both carry deoxygenated blood.
- (vii) **Assertion:** Blood entering the glomerulus is filtered under high pressure.
Reason: The afferent arteriole entering the glomerulus is narrower than the efferent arteriole.
- Both A and R are true, and R is the correct explanation of A.
 - Both A and R are true, but R is not the correct explanation of A.
 - A is true, but R is false
 - A is false, but R is true
- (viii) Abscisic acid (ABA) plays a crucial role during water stress in plants. Which of the following actions does ABA trigger?
- Promotion of flowering
 - Increased nutrient absorption
 - Stimulation of growth
 - Closure of stomata to reduce water loss
- (ix) How did the development of bipedalism contribute to the survival of early human ancestors?
- It allowed them to run faster than predators.
 - It freed the hands for tool use and carrying objects.
 - It reduced the need for water intake.
 - It enabled them to climb trees more efficiently.
- (x) In an accident, Ronit suffers from injury to the hypothalamus. This would most likely disrupt:
- Regulation of body temperature
 - Coordination during locomotion
 - Blinking of eyes
 - Short term memory
- (xi) Acid rain is primarily caused by the release of which pollutants into the atmosphere?
- Ozone and particulate matter
 - Heavy metals and organic compounds
 - Carbon dioxide and methane
 - Nitrogen oxides and sulphur dioxide
- (xii) The alternative forms of a gene are referred to as 'X'. Genes are located on 'Y'.
- X-Alleles, Y-Nucleus
 - X-Alleles, Y-Chromosomes
 - X-Genotype, Y-Mitochondria
 - X-Phenotype, Y-Ribosomes
- (xiii) **Assertion (A):** The function of Lymphocytes and Monocytes present in the lymph is to defend the body against infections.
Reason (R): The lymphocytes produce antibodies and the Monocytes are phagocytic in function.
- A is True, and R is false
 - A is False, and R is true
 - Both A and R are true
 - Both A and R are false

- (xiv) A plant with Yellow and wrinkled seeds with the genotype (Yyww) will give rise to which gametes:
- (a) Yy and ww (c) Yw and yw
 (b) Yw and Yw (d) Yw and ww
- (xv) Sana was looking at a nearby object. For better viewing which of the following is / are involved in the change in curvature of the elastic lens making it thicker?
1. Ciliary body
 2. Ciliary muscles
 3. Suspensory ligament
 4. Pupil
- (a) Only 1 and 2 (c) Only 1, 3 and 4
 (b) Only 4 (d) Only 1, 2 and 3

Question 2

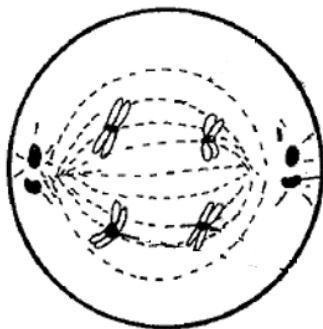
(i) Name the following:

[5]

- (a) The middle layer of the meninges.
- (b) The chemical substance released at the site of injury which initiates the process of blood clotting.
- (c) The other name of the internal ear.
- (d) The external female genitalia.
- (e) Loss of water through a cut stem.

(ii) Given below is a diagram representing a stage during mitotic cell division. Read the information given below the diagram and fill in the blanks:

[5]



Mitosis is the cell division in which one parent cell divides into two identical daughter cells. By and large, the four phases of mitosis are similar in both animal and plant cells.

In the phase shown in the diagram, the (a) _____ start moving apart and reach opposite poles. The (b) _____ become distinct. Sister chromatids attach to each other at a small region called (c) _____. The (d) _____ and (e) _____ disappear.

(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.

[5]

- (a) Ear ossicles, Pinna, Auditory nerve, Auditory canal.
- (b) Vas deferens, Epididymis, Seminiferous tubules, Urethra, Efferent ducts.

- (c) Axon endings, Cyton, Synapse, Node of Ranvier, Dendrite.
- (d) Conjunctiva, Retina, Cornea, Optic nerve, Lens.
- (e) Luteal phase, Menstrual phase, Follicular phase, Ovulatory phase.

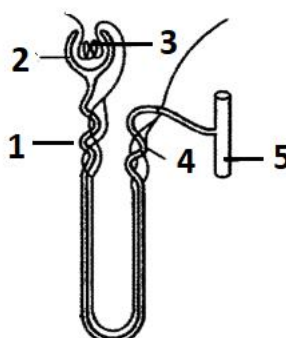
(iv) Read the explanations given below and name the structure: [5]

Example: The largest gland in the human body that secretes bile.

Answer: Liver

- (a) Equalises the air pressure on either side of the ear drum allowing it to vibrate freely.
- (b) Lying in the cortex at the end of the kidney tubule, opening into a collecting duct.
- (c) A blood vessel which has a small lumen and thick wall.
- (d) Derived from the Latin word “pupa” meaning “doll”, which in this context refers to the tiny image of oneself seen reflected in another’s eye.
- (e) An extra-embryonic layer that is present between the amnion and chorion.

(v) The diagram below represents a mammalian kidney tubule. Match the structures marked (1) to (5) with their correct functions: [5]

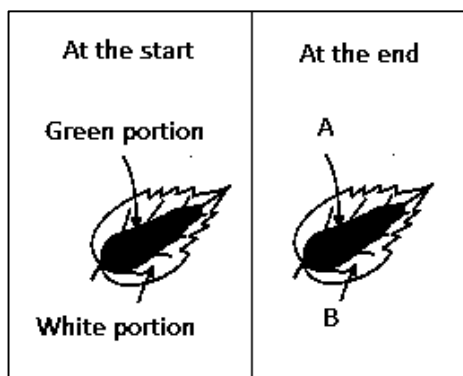
Male Reproductive System	Functions
	a. Ultrafiltration.
	b. Collects the glomerular filtrate.
	c. Reabsorbs most water.
	d. Collects urine.
	e. Involved in the process of tubular secretion.

SECTION B

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

Question 3

(i) The diagram given below is an experiment conducted to study a factor necessary for photosynthesis. Observe the diagram and answer the following questions: [5]

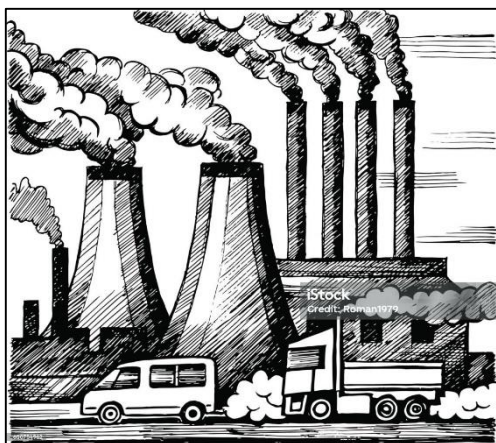


- (a) What is the aim of the experiment?
- (b) Name the test performed on the leaf and the solution used for the test.
- (c) What type of leaf was used for the experiment? Give an example.
- (d) What is the expected result of the above test on the parts marked A and B?
- (e) Give a balanced chemical equation to represent the process of photosynthesis

- (ii) State the difference between the arrangement of white and grey matter in the spinal cord and brain. [2]
- (iii) Some women have facial hair like beard and moustache. Give suitable reason. [1]
- (iv) State Mendel's law of segregation. [1]
- (v) Define photophosphorylation. [1]

Question 4

- (i) Observe the image given below and answer the following questions: [5]



- (a) Identify the type of pollution in the given image.
- (b) State one natural source for this pollution.
- (c) Mention the impact of this pollution on human health.
- (d) State one measure to control this pollution.
- (e) What is a 'pollutant'? Explain the term.

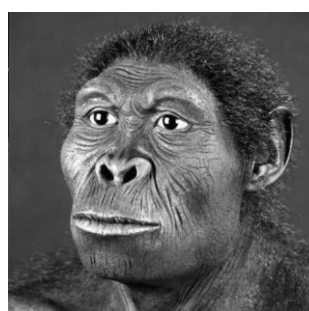
- (ii) The mature erythrocytes in humans lacks nucleus and mitochondria. Give reason. [2]
- (iii) Mention the exact location of the following: [2]
 - (a) Incus
 - (b) Prostate gland
- (iv) Define Gene. [1]

Question 5

- (i) Given below are two stages in the evolution of man. Study them and answer the questions that follow: [3]



(A)



(B)

- (a) Identify Australopithecus and Neanderthal man from the above pictures.
- (b) Mention one characteristic feature for each of the stage.
- (ii) Draw a neat and labelled diagram of portion of leaf epidermis showing one single stoma. [3]
- (iii) Mention any two adaptations in plants to reduce excessive transpiration. [2]

- (iv) Define the following terms: [2]
- (a) Pulse
 - (b) Demography

Question 6

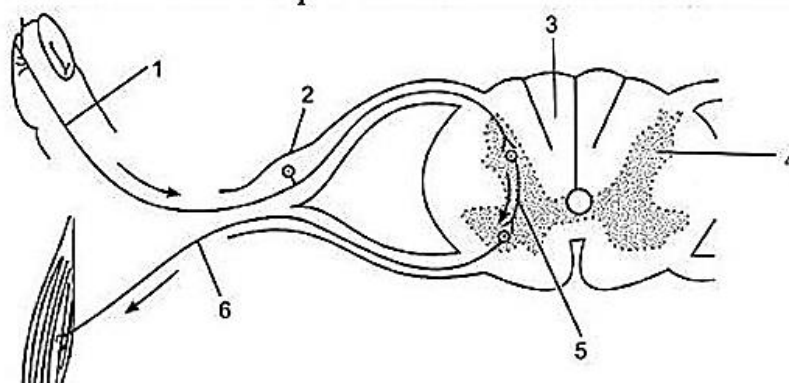
- (i) A pea plant which is homozygous for axial and purple flowers (AAPP) is crossed with a homozygous plant for terminal and white flowers (aapp). [5]
- (a) Give the genotype of the offsprings of F₁ generation.
 - (b) What is the phenotypic ratio of the F₂ generation?
 - (c) What is the scientific name of the plant which Mendel used for his experiments?
 - (d) Give a reason why Mendel selected garden pea for his experiments.
 - (e) Define mutation.

- (ii) State one function of each of the following structures: [3]
- (a) Ampulla
 - (b) Oviducts
 - (c) Pericardium

- (iii) Expand the following: [2]
- (a) ADH
 - (b) NADP

Question 7

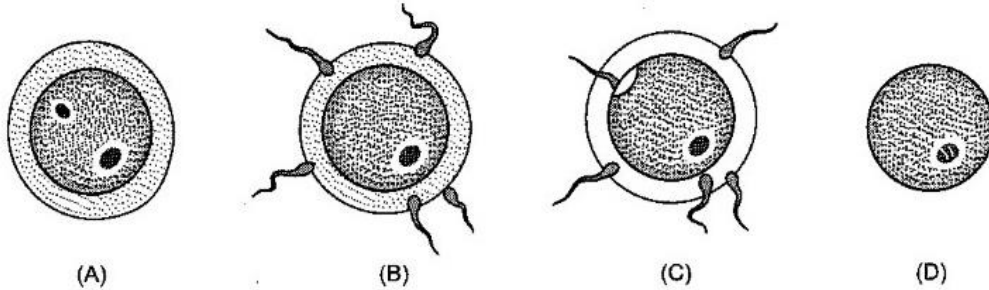
- (i) The diagram given below is a representation of a certain phenomenon to the nervous system. Study the diagram and answer the questions that follow: [5]



- (a) Name the phenomenon that is being depicted.
 - (b) Name the parts 1, 2, 3 and 4.
 - (c) Write the functions of parts 5 and 6.
- (ii) Draw a neat and labelled diagram of the structure of a single full grown root hair. [3]
- (iii) Complete the following definitions by inserting the key word/words indicated by '^'. Rewrite the complete definition and underline the key word/words inserted: [2]
- (a) The expulsion of urine from the ^ through the ^ by relaxation of the ^ under the impulse of the ^ is called micturition.
 - (b) Active transport is the passage of a substance from its ^ to ^ concentration through a living ^ using ^ of the cell.

Question 8

(i) Given below are diagrams showing the different stages in the process of fertilization of an egg in the human female reproductive tract. Study the diagrams and answer the questions: [5]



- (a) Arrange the letters given below each diagram in a logical sequence to show the correct order in the process of fertilization.
- (b) What is 'Implantation'?
- (c) Mention the chromosome number of the egg and zygote in humans.
- (d) Explain the term 'Gestation'. How long does Gestation last in humans?
- (e) How does the uterus prepare for the reception of zygote?

(ii) Draw a neat and labelled diagram of a generalized structure of a nerve cell. [3]

(iii) Give two possible reasons for 'Hyperopia'. [2]
