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for

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Class 10

**BIOLOGY**

Questions ONLY

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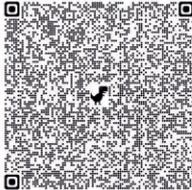
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**HINDI GRAMMAR**

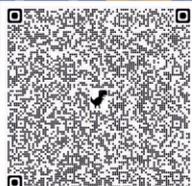
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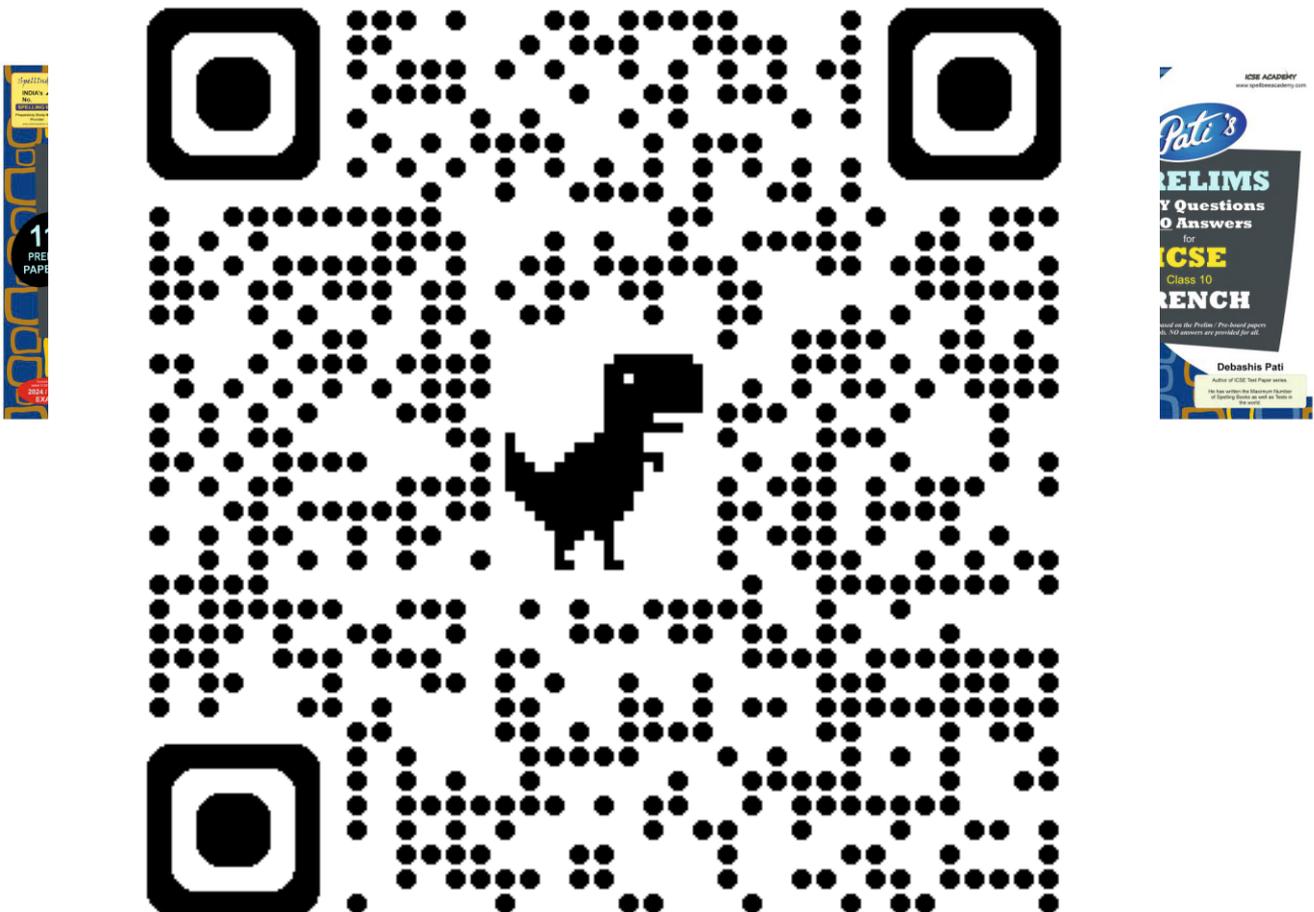
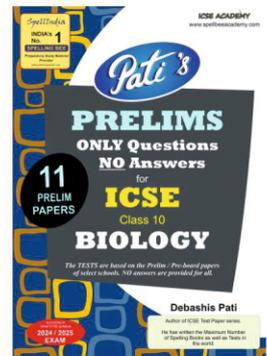
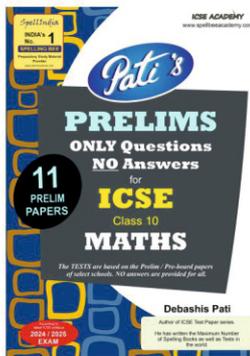
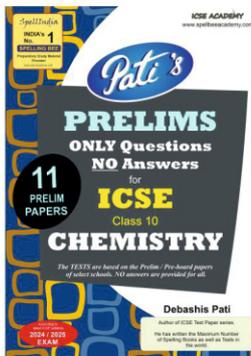
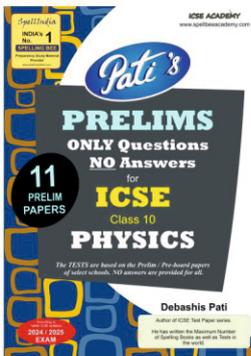
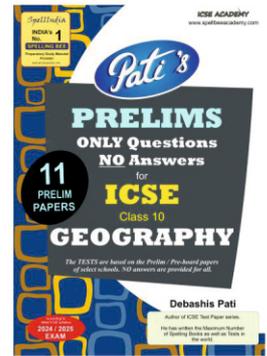
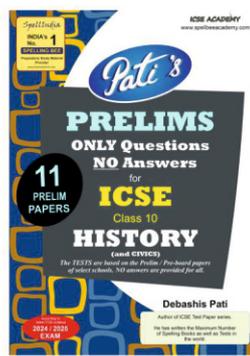
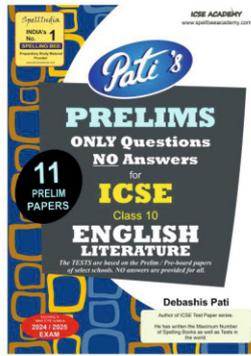
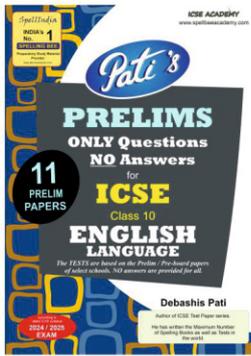
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(In this flipbook for 3a)

11. Loreto House, Kolkata
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15. Vissanji, Mumbai
16. Cathedral & John Connon, Mumbai
17. Pawar Public, Chandivali, Mumbai
18. Orion, Mumbai
19. Pawar Public, Hadapsar, Pune
20. Lilavati Podar, Mumbai

2025-2026 - Prelim 2



**ICSE ACADEMY**

## **Set 3c : Question Papers**

(Not in this flipbook but in the following one for 3c)

21. Bombay Scottish, Mumbai
22. Jamnabai Narsee, Mumbai
23. Anand Niketan, Nashik
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25. Karnataka ICSE Schools Association KISA
26. Bai Avabai F Petit Girls, Mumbai
27. Unknown - 1, Kolkata
28. Unknown - 2, Kolkata

LORETO HOUSE  
PRE-BOARD EXAMINATION 2025-2026  
BIOLOGY

CLASS: X

READING TIME: 15 MINS  
WRITING TIME: 2HRS  
FULL MARKS: 80

Section A

(Attempt all questions from this Section)

Question 1

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

[15x1]

- i. The hormone that maintains the thickening of the endometrium during pregnancy is-
- a) oxytocin   b) progesterone   c) oestrogen   d) testosterone
- ii. Planting trees is a better alternative than burning wood as fuel, due to which of the following reason?
- P. easily available  
Q. reduces soil erosion  
R. improves air quality
- a) only P   b) only Q   c) only P and R   d) only Q and R
- iii. Green leaf is boiled in methylated spirit in the test of starch, to remove-
- a) microbes   b) starch   c) cuticle   d) chlorophyll
- iv. A pair of corresponding chromosomes of the same shape, size and one from each parent is called:
- a) Autosomes   b) Allosomes   c) Analogous chromosomes   d) Homologous chromosomes
- v. Cytokinins are present in permanent tissues. Which of the following functions do they perform?
- P. promote cell division  
Q. inhibit germination  
R. promote seed dormancy
- a) only P   b) only Q   c) only P and Q   d) only Q and R
- vi. A person with antigen A in RBC and antibody B in plasma belongs to blood group-
- a) A   b) B   c) O   d) AB
- vii. Crossing over is observed in-
- a) mitosis   b) meiosis   c) interphase   d) resting phase

viii. Industrial melanism is the phenomenon by which the peppered moth-  
 a) extinct due to industrialisation    b) became darker in industrial areas for camouflage  
 c) became light resistant                d) became lighter due to natural selection

ix. Assertion (A): The foetus respire but does not breathe.

Reason (R): The maternal blood supplies oxygen to the foetus through placenta.

a) A is true R is false    b) A is false R is true    c) Both A and R are true    d) Both A and R are false

x. Sterilization of females involve cutting and tying of the:

a) uterus    b) ureter    c) oviduct    d) ovary

xi. Assertion (A): People living in hilly area are advised to use non-iodised salt.

Reason (R): They may suffer from myxoedema.

a) A is true R is false    b) A is false R is true    c) Both A and R are true    d) Both A and R are false

xii. Kabir was playing in the playground when a dust particle enters his left eye. His eye starts flushing tears due to-

a) exosmosis    b) reflex action    c) dehydration    d) voluntary action

xiii. Loop of Henle lies in renal-

a) cortex    b) medulla    c) pelvis    d) hilum

xiv. Assertion (A): Root hairs are present in the outermost layer of root called cortex.

Reason (R): Root hairs absorb mineral nutrients from the soil by osmosis.

a) A is true R is false    b) A is false R is true    c) Both A and R are true    d) Both A and R are false

xv. A student places a plant which is exposed to hot afternoon sun. In the evening he observes that the leaves have wilted. This is due to:

- a) osmoregulation
- b) transpiration
- c) respiration
- d) excretion



### Question 2

i. Name the following:

- a) Organ of balance of the human body.
- b) The basic units of heredity.
- c) Smallest unit of light energy, that activates chlorophyll.
- d) Gaseous compounds released from refrigerators, responsible for breakdown of atmospheric ozone.
- e) Statistical study of human population.

[5x1]

- ii. Arrange and rewrite the terms in each group in the correct order in a logical sequence beginning with the term that is underlined: [5x1]
- a) Ovulation, gestation, implantation, fertilization
  - b) Burning of fuel, global warming, greenhouse effect, CO<sub>2</sub> accumulation
  - c) Australopithecus, Cro-Magnon, *Homo erectus*, Neanderthal man
  - d) Hepatic portal vein, hepatic vein, stomach, liver
  - e) Nucleotide, nucleosome, DNA, chromatin fibre

- iii. Given below is the diagram of the human heart. Read the information given with the diagram and fill in the blanks. [5]



The human heart pumps blood throughout the body. It is the size of a large fist. The heart is located between the lungs in the thoracic cavity. It has four chambers. The heart functions all through the lifespan of a person and is responsible for the survival of the person.

The heart is enclosed by a membrane called (a) \_\_\_\_\_. The ventricles give rise to two large blood vessels called (b) \_\_\_\_\_ and (c) \_\_\_\_\_. The flaps of the cuspid valves are kept in position by (d) \_\_\_\_\_. (e) \_\_\_\_\_ arteries supply oxygenated blood to the walls of the heart.

- iv. Read the explanations given below and name the structure: [5x1]
- a) Biconcave shaped cells of human blood.
  - b) Part of the human body where Copper T is fitted to prevent implantation of blastocyst.
  - c) Lamarck suggested, this part of giraffe's body to have evolved following his principle of "use and disuse".
  - d) Site of photolysis of water in the cells of a green leaf.
  - e) Plant part where ethylene hormone is produced and found in abundance.

- v. Study the diagram given below and match the structures with their correct functions: [5x1]

Structure	Function
	a) secretes testosterone
	b) transports sperms to urethra
	c) stores sperms till maturation
	d) produce sperms
	e) regulates temperature of testis

**Section B**

(Attempt any four questions from this Section)

**Question 3**

- i. What is albuminuria? [1]
- ii. What is ADH? What is its function in the human body? [2]
- iii. During an adventure holiday trip Sunil tried bungee jumping. Name the hormone released in his body during the activity. Where is it secreted from and what is its function? [2]
- iv. Explain how insulin and glucagon have antagonistic functions. [2]
- v. With diagrams show how a laboratory instrument demonstrates geotropism in a potted plant. Name the instrument. [3]

**Question 4**

- i. Expand- ATP. [1]
- ii. Give two adaptations in leaves for Photosynthesis. [2]
- iii. Draw a neat labeled diagram of chloroplast. [2]
- iv. State two significance of photosynthesis. [2]
- v. Surya used a plant with variegated leaves for an experiment on photosynthesis. He tested a leaf with iodine after keeping the plant in sunlight for a few hours. [3]



- a. Which parts of the leaf will turn blue black after the iodine test?
- b. What does this tell us about the role of chlorophyll in leaves?
- c. Write the overall chemical equation of the process.

**Question 5**

- i. State Mendel's Law of Dominance. [1]
- ii. Give the common name and the scientific name of the plant on which Gregor Mendel conducted his breeding experiments. [2]
- iii. Define the following: a. Genome b. Mutation [2]
- iv. State the difference between phenotype and genotype. [2]
- v. Santosh loved his garden, especially his pea plants. One year, he noticed that all the pea plants he grew from one batch of seeds had round seeds. Curious, he took the seeds from one of those plants and grew a new generation. To his surprise, 75% of the new plants had round seeds, but 25% had wrinkled seeds.



Round



Wrinkled

- a. What were the genotypes of parent plants, Santosh originally planted?
- b. Which trait is dominant – round or wrinkled seeds?
- c. What is the genotypic ratio of the second generation (F<sub>2</sub>) plants?

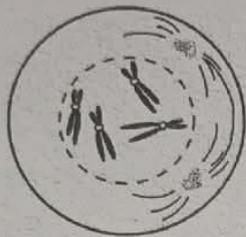
[3]

**Question 6**

- i. Define Natality. [1]
- ii. What is MTP? [2]
- iii. What is the cause of acid rain? [2]
- iv. Which radiation led to the Chernobyl disaster? What was the damage faced by the people? [2]
- v. State three harmful effects of noise pollution. [3]

**Question 7**

- i. What is pulse? [1]
- ii. Why are mature RBCs devoid of nucleus and mitochondria? [2]
- iii. What is double circulation? [2]
- iv. Pulmonary artery is an exception to the function of the other arteries. Explain. [2]
- v. Given below is a diagram depicting a stage in mitotic cell division. Study the same and answer the following questions. [3]



- a. Identify the stage.
- b. Give a suitable reason for your answer.
- c. Name the stage that follows.

**Question 8**

- i. Which tube connects the middle ear with the throat? [1]
- ii. Eye drop application can be sensed in the nose. Explain. [2]
- iii. What handicaps would result from damage to cerebellum? [2]
- iv. Sperms have large number of mitochondria in it. Give reason. [2]
- v. Draw a labeled diagram of a human sperm. [3]



Delhi Public School Megacity, Kolkata

Pre-Board Examination

Session : 2025-2026

Subject – Biology

Class - X

Maximum Marks: 40

Time: 1Hr

*This question paper contains 7 printed pages*

Section-A

*[Attempt all the questions from this section]*

✓ i. Select the correct answers to the questions from the given options. [5]

✓ i) A potato cube soaked in a certain solution for 48hrs, become turgid and heavy. The type of solution used, could be most likely:

- (a) 20% sucrose solution (b) Distilled water  
(c) Tap water (d) 75% sucrose solution

✓ ii) Identify the **incorrect** statement:

- (a)  $\text{CoCl}_2$  paper attached to the lower surface of a dorsiventral leaf turns pink faster on a windy day.  
(b) Stomatal transpiration is controlled by the size of the stomatal aperture.  
(c)  $\text{CoCl}_2$  paper attached to the upper surface of a dorsiventral leaf turns pink faster on a windy day.  
(d) Stomatal transpiration is controlled by the concentration of  $\text{CO}_2$  in the atmosphere.

✓ iii) Assertion (A) : Palisade parenchyma are loosely arranged towards the lower epidermis of a dorsiventral leaf.

Reason (R) : They contain maximum amount of chlorophyll and trap solar energy for photosynthesis.

- (a) A is true, R is false (b) A is false, R is true

(c) Both A and R are true (d) Both A and R are false

✓(iv) The phytohormone that accelerates senescence and abscission of leaves is:

(a) IAA (b) ABA (c) GA<sub>1</sub> (d) GA<sub>3</sub>

✓(v) Identify the **correct** pair of hormones:

P = Promotes rapid cell elongation in the side of the stem which is away from the light/sun.

Q = Stimulates the secretion of testosterone in males.

(a) P – Gibberellin Q- Oxytocin

(b) P – Auxin Q- Oestrogen

(c) P – Ethylene Q- FSH

(d) P – Auxin Q- LH

## Question 2

✓(i) Name the following: [3]

✓(a) A hormonal disorder marked by rapid heart rate, swollen neck region and protrusion of eyes.

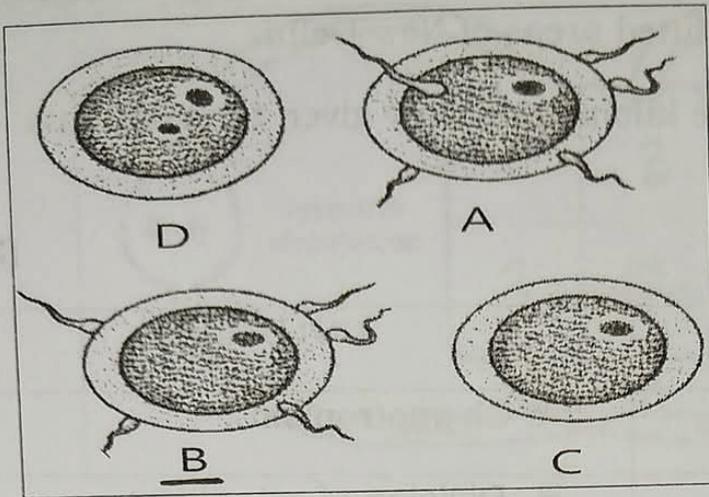
(b) Hair-like structures in the sunken stomata of *Nerium* sp.

✓(c) A particular kind of protein that constitutes 60% of the chromatin material.

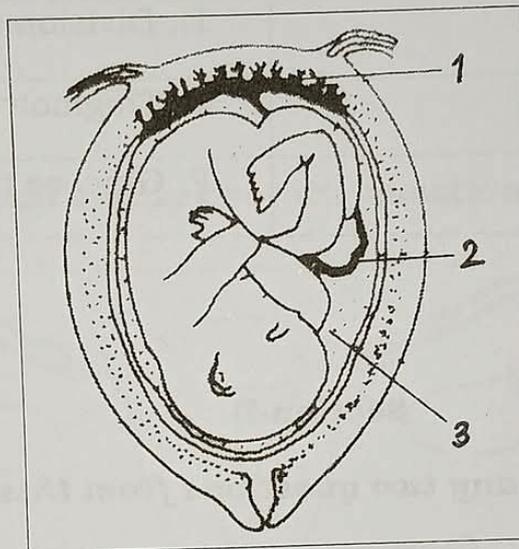
✓(ii) Arrange the following in logical sequence starting with the underlined words or the underlined alphabet in the diagram: [3]

✓(a) Cohesion in xylem, osmosis in root hair, conduction in root cortex, guttation.

✓(b) Removal of chlorophyll with methanol, dipping of leaf in boiling water, Softening of leaf in hot water, applying iodine solution to test for starch.



(iii) Fill in the blanks with suitable words, after studying the diagram properly: [3]



**Part (1)** is created by the chorion layer, which leads to the formation of **part (2)** that transports nutrients to the foetus and carries out metabolic wastes. **Part (3)** has a pivotal role in pregnancy since it not only protects the growing foetus, maintains an equal and even pressure on all sides to avoid any mechanical damage and prevents sticking of the foetus to the \_\_\_\_\_.

(iv) Read the descriptions and name the proper structure / substance / property : [3]

(a) The particular area in a leaf, near to the spongy mesophyll cells, that is saturated with water vapour on a cloudy day.

✓(b) A dense gaseous mixture of mainly two substances that lessen visibility and leads to respiratory problems in polluted areas of New Delhi.

✓(c) Number of individuals per square kilometer at any given time and in a particular area.

(v) Match the following:

[3]

COLUMN A	COLUMN B
1. Karyokinesis	A. Chemotropism
2. Stem Tendril	B. Division of cytoplasm
C. Polymerization	C. Glucose to Sucrose
	D. Division of nucleus
	E. Thigmotropism
	F. Glucose to Starch

### Section-B

*[Attempt any two questions from this section]*

#### Question 3

(a) Draw a neat diagram of an ideal blood smear under a microscope and label the following: [3]

1- A blood cell with 3-lobed nucleus

2- Initiators of blood clotting

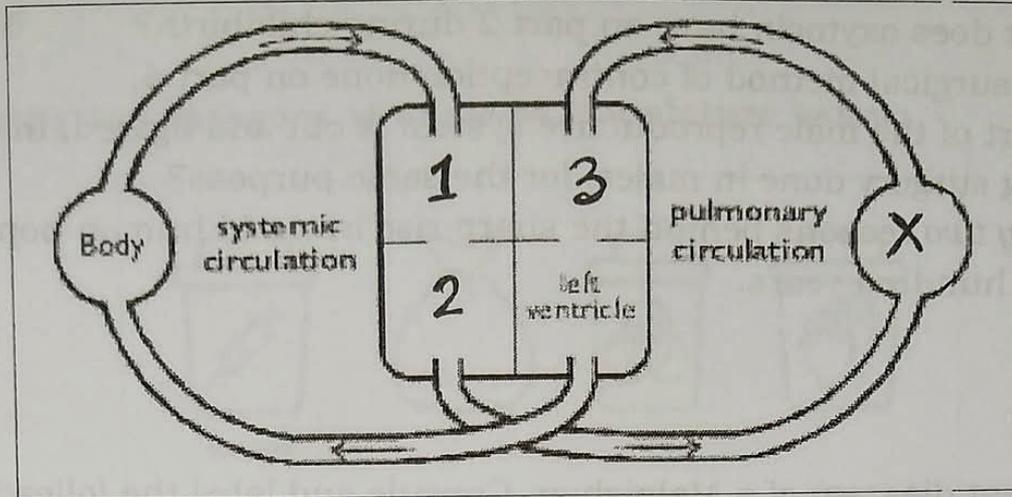
3- Biconcave-disc shaped blood cell

4- Liquid component of blood

(b) Absence of which cell organelle in a mature RBC allows it to squeeze through the walls of blood capillaries? Explain your answer. [2]

(c) Name two amoeboid blood cells that can perform phagocytosis. [1]

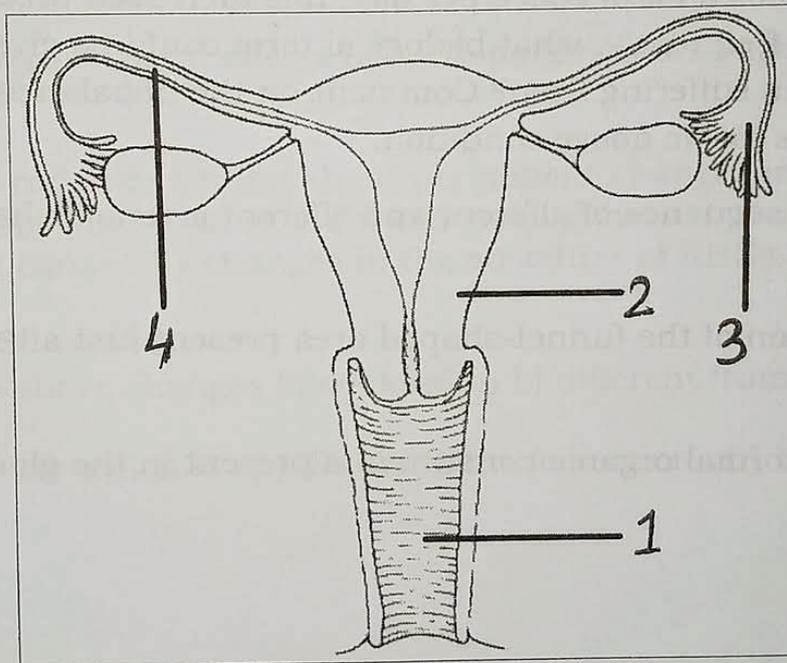
(d) Study the following diagram and answer the following questions:



- (i) Name the blood vessel leaving 2. What kind of blood flows through it? [2]
- (ii) Label part 3 and X. What is the function of X in circulation? [2]

✓ **Question 4**

**Study the following diagram and answer the questions that follow:**



- (i) Label the parts marked 1 to 4. [2]
- (ii) State why placenta is also considered an endocrine gland. [1]
- (iii) Mention any two other functions of placenta other than the one mentioned in subpart (ii). [1]
- (iv) Why do you think part 4 is lined with cilia? [1]

- ✓(vi) What effect does oxytocin have on part 2 during childbirth? [1]
- ✓(vi) Name the surgical method of contraception done on part 4. [1]
- ✓(vii) Which part of the male reproductive system is cut and ligated, in the corresponding surgery done in males, for the same purpose? [1]
- ✓(viii) State *any two* reasons behind the sharp rise in world human population since the last hundred years. [2]

### Question 5

(a) Draw a neat diagram of a Malpighian Capsule and label the following parts: [3]

- 1- Glomerulus                      2- Bowman's capsule  
3- Afferent arteriole              4 – Efferent arteriole

(b) What effect does adrenaline have on the sphincter muscles surrounding the urethra during an emergency situation? What happens to the same muscles when the crisis subsides? [2]

(c) If a man consumes a lot of coffee per day, has increased production of urine and has to urinate frequently, what biological term could be given to the *condition* the man is suffering from? Comment on the imbalance of a particular hormone that leads to the above condition. [2]

(d) Explain the consequence of afferent and efferent arterioles having different diameters. [1]

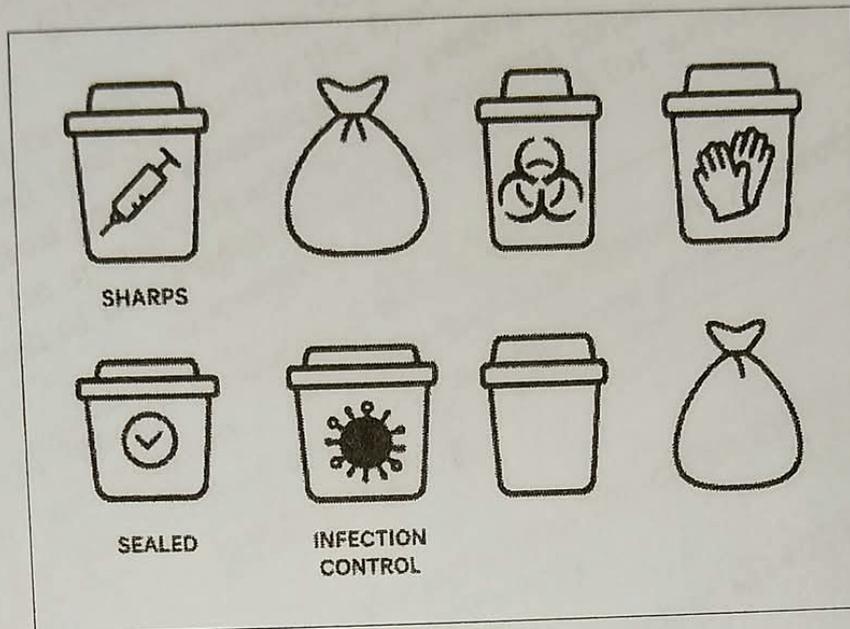
(e) State the function of the funnel-shaped area present just after the renal pyramids. [1]

(f) Name any two normal organic constituents present in the glomerular filtrate. [1]

✓ Question 6

✓(a) ✓(i) Identify the category of waste in the picture below:

[1]



✓(ii) Explain any two ways as to how these wastes are hazardous to humans/animals and aquatic life, if not disposed off properly. [2]

✓(iii) State *any three* harmful effects of noise pollution on humans/animals. [3]

✓(b) Radioactive radiations bring about permanent changes in the structure and number of chromosomes. What are these types of heritable changes called? Name a disease caused by changes in the structure of RBCs, due to these changes. [2]

✓(c) How are the above changes (discussed in b) different from Variations? [1]

✓(d) Explain the law which is applicable in the formation of F1 gametes of dihybrid cross. [1]

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HIRANANDANI FOUNDATION SCHOOL - POWAI  
SECOND PRELIMINARY EXAMINATION-JAN-2026  
BIOLOGY

STD: X  
DATE: 13.01.2026  
MARKS: 80

READING TIME: 15 min  
WRITING TIME: 2 Hour

---

*Answers to this paper must be written on 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.*

---

*Attempt all questions from section I and any four from section II.  
The intended marks for questions or parts of questions are given in brackets.*

---

**SECTION I (40 Marks)**

(Attempt all questions from this Section)

**Question 1**

Select the correct answers to the questions from the given options. (Do not copy the question. Write both the correct answer number and answer words): [15]

- i. Rohan was performing an experiment on transpiration. He placed a strip of paper on the lower surface of a leaf, which changed from blue to pink. The indicator of moisture that he used in the experiment was:
  - a. Filter paper
  - b. Blotting paper
  - c. Litmus paper
  - d. Cobalt chloride paper
- ii. The term 'heterozygous' refers to:
  - a. Two identical alleles for a gene
  - b. Two different alleles for a gene
  - c. A dominant allele
  - d. A recessive allele
- iii. Which of the following is a non-biodegradable pollutant?
  - a. Paper
  - b. Plastics
  - c. Vegetable waste
  - d. Animal remains

HFS, POWAI

.....2.....

Std. X/ BIOLOGY

iv. Surbhi experiences vision problems due to insufficient blood flow to the retina, reducing nutrient supply to it. Which part of the eye is impaired in this condition?

- a. Optic nerve
- b. Cornea
- c. Sclera
- d. Choroid

v. **Assertion (A):** Ultrafiltration in glomerulus is a process driven by high hydrostatic pressure.

**Reason (R):** Afferent arteriole has a wider diameter than efferent arteriole.

- a. Both A and R are True
- b. Both A and R are False
- c. A is True and R is False
- d. A is False and R is True

vi. The liver breaks down old red blood cells and produces a substance known as:

- a. Glucagon
- b. Insulin
- c. Bilirubin
- d. Glycogen

vii. **Assertion (A):** Imbibition is the phenomenon responsible for the swelling of wooden doors during rainy season.

**Reason (R):** Imbibition involves absorption of water by hydrophobic substances like cellulose in the wood.

- a. Both A and R are True
- b. Both A and R are False
- c. A is True and R is False
- d. A is False and R is True

Turn over...

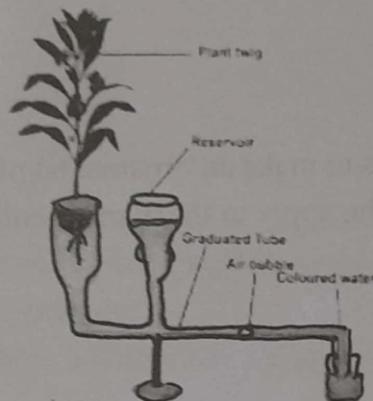
- viii. In humans, gestation period is vital for the complete development of the foetus. The average gestation period in humans is:
- 180 days
  - 190 days
  - 280 days
  - 290 days
- ix. A horticulturist wants to make an ornamental plant bushier. Which hormone can he apply to the plant to enhance lateral shoot growth?
- Auxins
  - Gibberellins
  - Cytokinins
  - Ethylene
- x. A Lab technician notices that a patient's urine is darker than usual. The pigment likely to be responsible for this increase in colour is:
- Melanin
  - Haemoglobin
  - Creatinine
  - Urochrome
- xi. **Assertion (A):** Adrenaline is released during stress to prepare the body for a 'fight or flight' response.  
**Reason (R):** During stress, adrenaline decreases blood glucose levels by stimulating the breakdown of glycogen in liver.
- Both A and R are True
  - Both A and R are False
  - A is True and R is False
  - A is False and R is True
- xii. The plant organelle that contains its own DNA:
- Mitochondria and chloroplast
  - Golgi bodies and mitochondria
  - Endoplasmic reticulum and golgi bodies
  - Golgi bodies and chloroplast

HFS, POWAI

.....4.....

Std. X/ BIOLOGY

- xiii. Riya sets up a Ganong's potometer to measure the rate of transpiration in a plant. She tests the plant under different conditions. What would be her observation?



- The air bubble moves quickly towards the twig when the apparatus is placed in humid conditions.
  - The air bubble moves very quickly towards the twig when the apparatus is placed in complete darkness.
  - The air bubble moves very quickly towards the twig when the apparatus is placed in bright light with a fan blowing air across the leaves.
  - The air bubble does not move towards the twig when the apparatus is placed in bright light with a fan blowing air across the leaves.
- xiv. Arrange the following steps in the correct sequence as they occur during photosynthesis.
- Photophosphorylation generates ATP
  - A photon excites chlorophyll molecules in the photosystem
  - Photolysis of water occurs, releasing hydrogen and hydroxyl ion
  - Glucose is synthesized during biosynthetic phase
- 4, 2, 3, 1
  - 3, 2, 1, 4
  - 2, 3, 1, 4
  - 1, 3, 2, 4

Turn over...

HFS, POWAI

.....5.....

Std. X/ BIOLOGY

xv. **Assertion (A):** Acid rain can damage buildings and monuments made of limestone and marble.

**Reason (R):** The acids in acid rain react with calcium carbonate in limestone and marble, leading to the erosion of the monuments.

- a. Both A and R are True
- b. Both A and R are False
- c. A is True and R is False
- d. A is False and R is True

**Question 2**

i. Name the following:

[5]

- a. The vitamin necessary for the production of prothrombin.
- b. Point of contact between homologous chromosomes during the exchange of genes during meiosis.
- c. Condition characterised by the development of male features in females, caused by the overgrowth of adrenal cortex.
- d. Metallic element present in the chlorophyll molecule that facilitates photosynthetic activities.
- e. Part of the human ear that plays a key role in maintaining static balance.

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

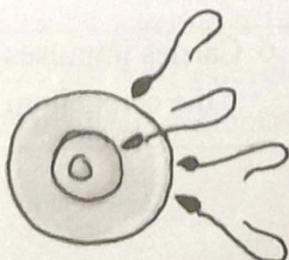
[5]

- a. Chromatin fibres, Nucleosome, Genes, DNA.
- b. Anterior vena cava, Lymph vessels, Right auricle, Lymph.
- c. Hypothalamus, Cortisone, Adrenal cortex, Anterior Pituitary Gland.
- d. Central nervous system, Stimulus, Effector, Motor neuron.
- e. Xylem of the leaf, Substomatal space, Water, Stomata

iii. Given below is the diagrammatic representation of fertilization in human body.

Read the information below the diagram and fill in the blanks:

[5]



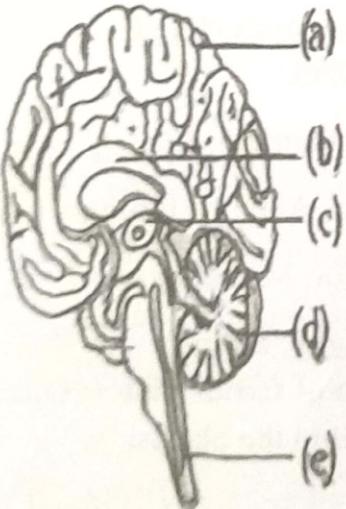
Turn over...

Fertilization in humans is the process where male gametes fuses with the female gametes to form a single cell called the zygote. The resulting zygote contains a complete set of 46 chromosomes, half of which comes from the father and the other half from the mother. This process is essential for sexual reproduction, as it combines genetic material from both the parents, giving rise to a genetically distinct individual.

During fertilization many sperm reach the egg, but only one fuses with the egg. The successful sperm releases an enzyme called hyaluronidase from its (a) \_\_ to dissolve the egg's outer layer. This process occurs in the (b) \_\_\_\_\_ of the female reproductive system. The resulting zygote undergoes repeated cell division to form a hollow ball of cells called (c) \_\_ which travels to the (d) \_\_ and fixes itself into its lining during a process called (e) \_\_\_\_\_.

- iv. Given below is a cross section of the human brain. Match the structures marked (a) to (e) with their correct functions: [5]

**Example: (f) – 6.** Carries impulses from one hemisphere of the cerebellum to the other

Cross Section of Human Ear	Functions
	1. Relays pain and pressure impulses to cerebrum.
	2. Coordinates muscular activity and maintains body balance
	3. Controls involuntary activities
	4. Transfer information from one cerebral hemisphere to the other
	5. Seat of intelligence and will power
	6. Carries impulses from one hemisphere of the cerebellum to the other

HFS, POWAI

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Std.X/ BIOLOGY

v. Read the explanations given below and name the structure: [5]

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

**Answer:** Liver.

- a. Organ of hearing found within the cochlea that contains sensory cells.
- b. Openings in the leaf epidermis, located at the margins of the leaves, which are involved in the process of guttation.
- c. Extensions of outer epidermal cells of the root.
- d. Type of leucocytes, characterised by a large, kidney shaped nucleus that plays a role in phagocytosis.
- e. Hollow muscular organ in the pelvic region that temporarily stores urine before it is excreted from the body.

**SECTION B**

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

**Question 3**

- i. State Mendel's Law of Segregation. [1]
- ii. Define the following terms: [2]
  - a. Vestigial organ
  - b. Speciation
- iii. What is the role of prostate gland and seminal vesicles in male reproductive system? [2]
- iv. A team of anthropologists has discovered a set of fossilised remains in a remote area. The team is trying to identify which early human ancestor these characteristics might belong to. Based on the characteristics, identify the human ancestors. [2]
  - a. Cranial capacity ranging between 450 – 600 cm<sup>3</sup>, prognathous face and lack of chin.
  - b. Cranial capacity ranging between 1450 – 1600 cm<sup>3</sup>, orthognathous face and a well developed chin.
- v. Draw a neat, labelled diagram of stomatal apparatus. [3]

**Turn over...**

HFS, POWAI

.....8.....

Std.X/ BIOLOGY

Question 4

- i. Why do unripe bananas ripen when stored with ripe oranges? [1]
- ii. Differentiate between population density and natality. [2]
- iii. Make a Punnett square and find out the genotypic and phenotypic ratios of  $F_2$  generation in the progeny of a genetic cross between:  
A pure tall (TT) pea plant with a pure dwarf (tt) pea plant. [2]
- iv. During a routine inspection at a nuclear power plant, a technician discovers that a radioactive isotope has leaked into a nearby river. This is found to accumulate in the endocrine gland which is responsible for regulating metabolic activities in the human body.  
Mention the radioactive isotope and the endocrine gland. [2]
- v. A group of students is conducting an experiment to investigate how different factors affect the rate of photosynthesis in a plant. [3]



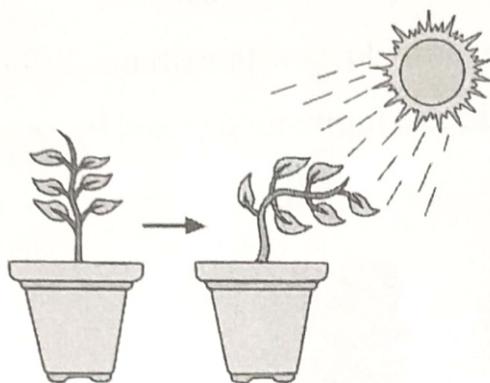
- a. Identify the factor being investigated.
- b. What is the reason for using potassium hydroxide in the experiment?
- c. What did the students observe when the leaf A was tested for starch?

Question 5

- i. Why do plants droop or wilt in the afternoon? [1]
- ii. Write two functions of centromere. [2]
- iii. What are the factors contributing to the population growth in India? [2]

Turn over...

- iv. Plants exhibit the ability to grow towards light, a process that helps them optimize photosynthesis. This movement is not random but is controlled by a specific biological mechanism that involves the distribution of plant hormones. [2]



- a. Define the phenomenon demonstrated in the picture?  
b. How does the hormone auxin contribute to this process?
- v. Draw a neat and well labelled diagram of a neuron. [3]

**Question 6**

- i. Why is blind spot considered as an area of no vision? [1]  
ii. What is the natural pacemaker of the human body? Where is it located? [2]  
iii. In what ways does the amnion support the foetus during pregnancy? [2]  
iv. In the process of pickling vegetables, how does salt help preserve the food and prevent spoilage? [2]  
v. Draw a neat, labelled diagram of a cross section of the blood vessel that transports blood towards the heart. [3]

**Question 7**

- i. Why is blood group 'O' referred to as the universal donor? [1]  
ii. During which stage of mitosis do the following events occur? [2]  
a. Chromosomes condense and become visible inside the nucleus.  
b. The mitotic spindle forms and chromosomes align themselves along the cell's equatorial plane.

HFS, POWAI

.....10.....

Std.X/ BIOLOGY

- iii. What are neurotransmitters? Give an example. [2]
- iv. Sanjay was walking in a forest when he suddenly encountered a wild animal. How did the activation of his sympathetic nervous system affect his pupils and blood vessels in this high stress situation? [2]
- v. The image shows two individuals with extreme differences in height. This condition is caused due to a hormone secreted by an endocrine gland. [3]



- a. Where is this gland located?
- b. Define tropic hormones.
- c. A couple struggling with infertility was advised to check the hormone secreted by this gland, that plays a key role in gametogenesis. Name the hormone.

**Question 8**

- i. What is cytokinesis? [1]
- ii. Given below are two statements which are incorrect. Rewrite the correct statements. [2]
- a. Depletion of ozone layer is caused by increased levels of carbon monoxide in the atmosphere.
- b. Vasopressin causes contraction of uterus during childbirth.

Turn over....





**Maneckji Cooper Education Trust School**  
Juhu Tara Road, Mumbai - 400 049

**PRELIMINARY EXAMINATION 2025- 2026**

**~BIOLOGY~**

**DATE : 12.01.2026**

**TIME : 2 HOURS**

**STD : X**

**MARKS : 80**

*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.*

*Attempt **all** the questions from **Section A** and **any four** from **Section B**.  
The intended marks for questions or parts of questions are given in brackets ( ).*

**SECTION A - 40 marks**

*(Attempt all questions)*

**Question 1:**

(15)

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

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

(i) Assertion (A): Identical twins always belong to the same sex.  
Reason (R): They develop from a single zygote that splits into two embryos.

- (a) Both assertion and reason are true.
- (b) Assertion is false and reason is true.
- (c) Assertion is true and reason is false.
- (d) Both assertion and reason are false.

(ii) When a red blood cell is placed in distilled water, it swells and bursts because the solution is:

- (a) Isotonic
- (b) Hypertonic
- (c) Hypotonic
- (d) Saline

(iii) Which statements are correct regarding plant hormones?

- (P) Auxins promote cell elongation
- (Q) Cytokinins delay senescence
- (R) Abscisic acid promotes seed germination

- (a) Only P
- (b) Only P and Q
- (c) Only Q and R
- (d) Only P and R

(iv) Assertion (A): The corpus luteum secretes progesterone.

Reason (R): Progesterone maintains the uterine lining for implantation.

- (a) Both assertion and reason are true
- (b) Assertion is false and reason is true
- (c) Assertion is true and reason is false
- (d) Both assertion and reason are false

(v) Assertion (A): A person suffering from severe dehydration produces highly concentrated urine.

Reason (R): More water is reabsorbed from the filtrate in the kidney tubules.

- (a) Both assertion and reason are true
- (b) Assertion is false and reason is true
- (c) Assertion is true and reason is false
- (d) Both assertion and reason are false

(vi) A student is unable to hear low-intensity sounds but can hear loud sounds clearly. The defect is most likely due to damage in the:

- (a) Eustachian tube
- (b) Cochlea
- (c) Semicircular canals
- (d) Tympanic membrane

(vii) Which of the following pollutants is specifically reduced by enforcing strict vehicular emission standards?

- (a) Carbon dioxide
- (b) Nitrogen and sulphur oxides
- (c) Oxygen
- (d) Water vapour

(viii) Which event occurs immediately after ovulation if fertilisation does not take place?

- (a) Implantation
- (b) Formation of corpus luteum

- (c) Breakdown of endometrium  
(d) Onset of menopause
- (ix) Which hormone is mainly responsible for longitudinal growth of internodes in dwarf plants?
- (a) Auxin  
(b) Cytokinin  
(c) Ethylene  
(d) Gibberellin
- (x) A plant kept in a closed room with very high humidity shows reduced transpiration mainly because:
- (a) Stomata remain permanently closed  
(b) Diffusion gradient of water vapour decreases  
(c) Rate of photosynthesis increases  
(d) Root pressure decreases
- (xi) A fruit kept at room temperature ripens faster than one kept in a refrigerator. This is mainly because:
- (a) Low temperature increases ethylene action  
(b) High temperature inhibits respiration  
(c) Ethylene action is reduced at low temperature  
(d) Oxygen concentration is higher in refrigerator
- (xii) Damage to the dorsal root of a spinal nerve will result in loss of:
- (a) Motor response only  
(b) Sensory impulse transmission  
(c) Reflex action completely  
(d) Voluntary movement only
- (xiii) The first human species who showed bipedalism was \_\_\_\_\_.
- (a) Homo habilis (b) Cro-Magnon (c) Neanderthals (d) Australopithecus
- (xiv) A man undergoes vasectomy. Which of the following remains **unaffected** immediately after the procedure?
- (a) Transportation of sperms  
(b) Secretion of testosterone  
(c) Ejaculation of semen  
(d) Fertilising capacity of sperms
- (xv) Cro-Magnon man is best described as:
- (a) The earliest ape-like ancestor of humans  
(b) An early human with a well-developed brain and use of tools  
(c) A modern human lacking agriculture knowledge  
(d) A prehistoric human who lived before Australopithecus

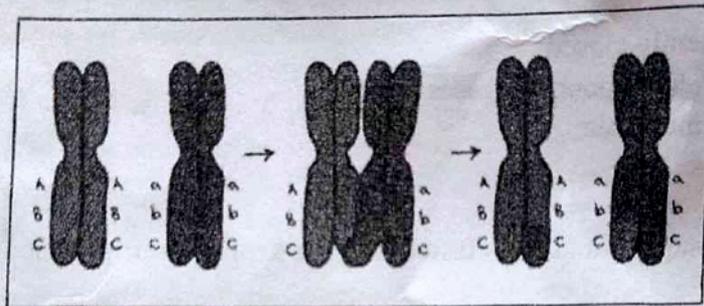
**Question 2**

(5)

(i) Give the biological term for:

- (a) The branch of the renal artery which enters into the Bowman's capsule.
- (b) The process of several glucose molecules converted to one molecule of starch.
- (c) The process by which WBCs engulf bacteria.
- (d) The mineral element essential for clotting of blood.
- (e) Structure through which guttation occurs.

(ii) Given below is one of the significance of meiosis. Identify the same and fill in the blanks: (5)



When \_\_\_(1)\_\_\_ and \_\_\_(2)\_\_\_ chromosomes are separating, the \_\_\_(3)\_\_\_ material often gets exchanged between two members of a \_\_\_(4)\_\_\_ pair. This is known as \_\_\_(5)\_\_\_ which results in genetic recombination.

(iii) Choose the odd one out from the following terms and name the category to which the others belong : (5)

- (a) Stoma, Epidermal Cell, Guard Cell, Lenticel
- (b) Addison's Disease, Cushing's Syndrome, Acromegaly, Leukemia
- (c) Basophil, Neutrophil, Eosinophil, Lymphocytes
- (d) Cowper's gland, Prostate gland, Lacrimal gland, Seminal vesicle
- (e) Polythene bag, Crop residue, Decaying vegetable, Animal waste

(iv) Arnav, a Class X student, visited a science museum where he observed a large interactive model of the **human heart**. The display explained how blood flows through different chambers and valves. Beside the model, a set of questions was provided for students to check their understanding. Help Arnav answer the following: (5)

- (a) Name the largest artery that originates from the left ventricle.
- (b) Which chamber of the heart receives deoxygenated blood from the body?
- (c) Name the valve that prevents the backflow of blood from the left ventricle to the left atrium.
- (d) Which blood vessel brings oxygenated blood from the lungs to the heart?
- (e) What is the rhythmic contraction and relaxation of the heart called?

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

(5)

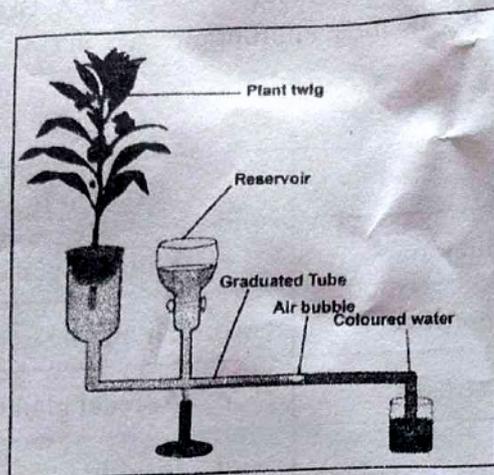
Column I	Column II
1. Hormone that regulates metabolic rate	a. Pituitary gland
2. Hormone that increases blood sugar level	b. Thyroxine
3. Hormone secreted during fear or stress	c. Adrenal gland
4. Gland located above the kidneys	d. Insulin
5. Hormone responsible for development of secondary sexual characters in males	e. Glucagon
	f. Testosterone
	g. Ovaries
	h. Adrenaline

**SECTION B- 40 marks**

( Attempt any **four** questions from this Sections )

**Question 3 :**

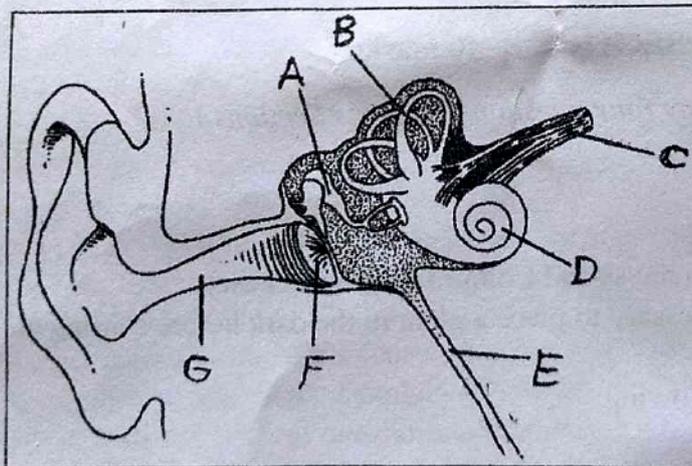
- (i) What is a pulse? (1)
- (ii) Differentiate between : Night blindness and Colour blindness (cause) (2)
- (iii) Give biological reason : It is necessary to place a plant in the dark before starting an experiment on photosynthesis. (2)
- (iv) Give biological terms for the following: (2)
  - a. A rise in blood pressure.
  - b. Movement of molecules of a substance from their higher concentration to lower concentration when they are in direct contact.
- (v) The diagram of an apparatus given below demonstrates a particular process in plants. Study the same and answer the questions that follow. (3)



- Name the apparatus.
- Why is the twig cut obliquely and under water?
- Give the function of the reservoir.

**Question 4 :**

- What is meant by glycosuria? (1)
- If you uproot a plant from the soil, its leaves soon wilt. Justify the statement. (2)
- Differentiate between : Menarche and Menopause (Age) (2)
- State the two principles of Lamarck's theory that were widely accepted. (2)
- Study the diagram given below and answer the questions that follow: (3)



- Name two fluids found in part D.
- State the range of frequency audible to humans.
- Which part is responsible for dynamic balance?

**Question 5 :**

- Why does the medulla of the kidney show a striped appearance? (1)
- What is astigmatism? How is it caused? (2)

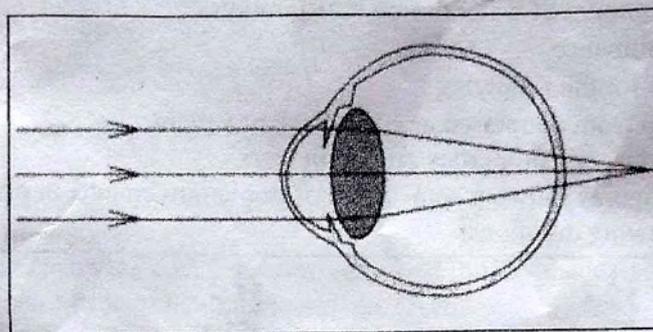


STD : X SUBJECT : BIOLOGY

- (v) Draw a neat and labelled diagram of L. S. of a Human kidney showing renal capsule, renal cortex, renal column, renal pelvis and ureter. (3)

**Question 8 :**

- (i) Write the characteristics of the image that falls on the retina of the eye. (1)  
(ii) Basement godowns fully stocked with bags containing foodgrains have got their walls cracked after the rain water has flooded in. Give biological reasons. (2)  
(iii) Describe two types of air pollution. (2)  
(iv) State any two functions of amniotic fluid. (2)  
(v) Study the diagram and answer the questions that follow: (3)



- a) Identify the eye defect shown above.  
b) State one cause for the above shown defect.  
c) What is the corrective measure that can be used in the above defect to improve the vision?
-

**L. R. & S. M. VISSANJI ACADEMY**  
**Secondary Section 2025-26**  
**Second Preliminary Examination**  
**Subject: Biology**



**Std: 10**

**Marks: 80**

**Date: 14/01/2026**

**Time: 2 Hrs**

**INSTRUCTIONS:**

- 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.
- This paper has **7** printed pages

**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**

**Question 1**

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

**(Do not copy the questions, write the correct answers only.)** [15M]

- i. DNA strands wound around a histone octamer forms a complex called a :**
- Nucleotide
  - Chromosome
  - Nucleosome
  - Gene
- ii. The sex of a person depends on :**
- The genetic makeup of autosomes found in the egg cell.
  - The genetic makeup of autosomes found in the sperm cell.
  - Whether the unfertilized egg contains an X- or Y-chromosome.
  - Whether the sperm fertilizes egg contains an X- or Y-chromosome.
- iii. Transpiration decreases with increase in \_\_\_\_\_**
- Temperature
  - Wind velocity
  - Atmospheric pressure
  - All of the above
- iv. Part of chloroplast where biosynthetic phase occurs.**
- Thylakoid
  - Mitochondria
  - Granum
  - Stroma
- v. What is the main advantage of burning biogas?**
- It leaves behind a lot of ash.
  - It produces a lot of smoke.
  - It burns without smoke.
  - It is a costly fuel

vi. The highest water potential (capacity to move out to higher concentrated solution) is that of \_\_\_\_\_

- a. Pure water
- b. 10% Salt solution
- c. Honey
- d. 50% Sugar solution

vii. Birth rate is the number of live births \_\_\_\_\_

- a. per 100 people per year.
- b. per 1000 people per year.
- c. per 100 people per month
- d. per 1000 people per month.

viii. Non-granular WBCs are :

- a. Lymphocytes and Monocytes
- b. Lymphocytes and Basophils
- c. Eosinophils and Basophils
- d. Eosinophils and Monocytes

ix. Assertion (A) : If human urine is allowed to stand for some time, it smells strongly of ammonia.

Reason (R) : The main constituent of human urine is ammonia.

- a. Both A and R are true
- b. Both A and R are false
- c. A is true and R is false
- d. A is false and R is true

x. Assertion (A) : Dura mater is thin delicate middle layer giving a web like cushion.

Reason (R) : Dura mater, pia mater, gray mater are the three bony coverings of brain.

- a. Both A and R are true
- b. Both A and R are false
- c. A is true and R is false
- d. A is false and R is true

xi. Which of the following is not a vestigial organ ?

- a. Epiglottis
- b. Vermiform appendix
- c. Ear pinna
- d. Wisdom teeth

xii. In man's eye, the sclerotic is made up of \_\_\_\_\_.

- a. Bone
- b. Muscles and Cartilage
- c. Fibrous connective tissue
- d. Only Cartilage

xiii. In human beings, fraternal twins are formed by \_\_\_\_\_.

- a. fertilization of one egg by one sperm
- b. fertilization of one egg by two sperms
- c. fertilization of two eggs by one sperm
- d. fertilization of two eggs by two sperms

xiv. Which of these hormones helps to increase the plant's tolerance to stress conditions like drought ?

- a. Auxins
- b. Cytokinins
- c. Gibberellins
- d. Abscisic acid

**xv. In the pancreas, which are the cells that secrete insulin, decrease the blood levels of glucose.**

- a. Delta
- b. Alpha
- c. Beta
- d. Gamma

**Question 2**

**i. Name the following :** [5M]

- a. The size of population in relation to per unit area at a given time.
- b. Pair of genes responsible for a particular characteristic in an individual.
- c. The compound formed when haemoglobin combines with carbon dioxide in blood.
- d. The structure which connects the placenta and the foetus.
- e. The part of the brain that carries impulses from one hemisphere of the cerebellum to the other.

**ii. Arrange and rewrite terms in each group in the correct order so as to be in a logical sequence beginning with term that is underlined :** [5M]

- a. Homo habilis, Cro-magnon man, Australopithecus, Homo erectus, Neanderthal man
- b. Artery, Veins, Capillaries, Venules, Arteriole
- c. Lens, Pupil, Conjunctiva, Yellow spot, Cornea.
- d. Soil water, root hair, Xylem, cortex, endodermis
- e. Association neuron, Effector, Motor neuron, Receptors, Sensory neuron.

**iii. Fill in the blanks with suitable words :** [5M]

- a. \_\_\_\_\_ is manmade compounds that have been widely used as refrigerants and in spray propellants and foam blowing causing depletion of ozone.
- b. The physical expression of genes is called \_\_\_\_\_
- c. \_\_\_\_\_ is present on the tip of roots and shoots.
- d. One of the product of \_\_\_\_\_ of water is oxygen.
- e. \_\_\_\_\_ means division of nucleus.

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

- a. Afferent arteriole, Efferent arteriole, Vasa recta, Glomerulus
- b. Burning, Combustion, Respiration, Photosynthesis
- c. Land, Water, Industry, Energy, Minerals
- d. Fallopian tube, Vagina, Uterus, Ovaries
- e. Promoting cell division, Inhibiting growth, Fruit ripening, Increasing blood glucose levels

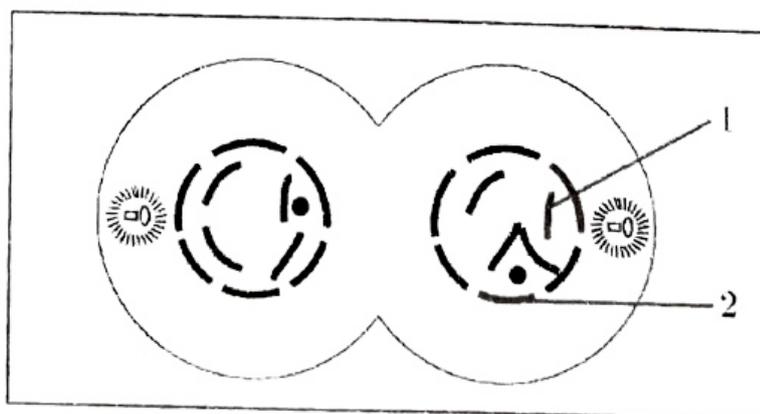
v. Match the items given in Column I with the most appropriate ones in Column II and rewrite the correct matching pairs : [5M]

Column I	Column II
i. Concentration of urine	a. Cerebellum
ii. Gigantism	b. Over secretion of growth hormone in adults
iii. Acromegaly	c. Henle's loop
iv. Muscular coordination	d. Over secretion of growth hormone in childhood
v. Expulsion of urine	e. Urethra
	f. Cerebrum

**Section B**

**Question 3**

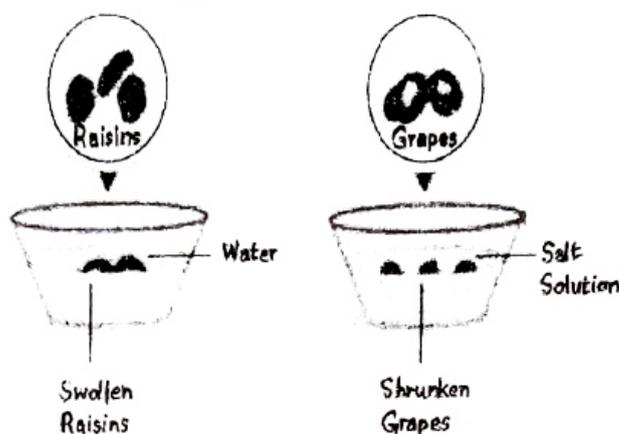
- i. Represent Photosynthesis with a balanced chemical equation. 1M
- ii. A certain couple got only four daughters in a row and no son. Does it mean that the husband does not produce Y-bearing sperms? Explain. 2M
- iii. A tree swell above girdled area after removal of a bark ring? Justify. 2M
- iv. A matured mammalian erythrocyte lacks nucleus and mitochondria. Give reasons. 2M
- v. Study the diagram given below which represents a stage during the mitotic cell division and answer the questions that follow: 3M



- a. Name the parts numbered 1 and 2.
- b. Which cell is presented in the given diagram? Justify your answer.

**Question 4**

- i. Explain why a person urinates less on a hot day. 1M
- ii. Differentiate between Mitosis and Meiosis ( Based on no. of daughter cells and type of cells undergoing division ) 2M
- iii. Mention the number of paired homozygous chromosomes in  
1. Human female, 2. Human male 2M
- iv. Give any two limitations for use of a potometer 2M
- v. Study the diagram carefully and answer the question that follows : 3M



- a. What is the aim of the experiments in A and B ?
- b. What happens when dry seeds are soaked in water ? Name the term used for it.

**Question 5**

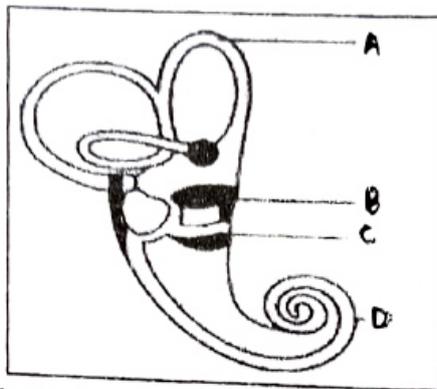
- i. Give all components of nucleotide. 1M
- ii. What is the advantage of destarching a plant before the start of the photosynthetic experiment ? How do you destarch a plant ? 2M
- iii. What is Bolting ? Give one example. 2M
- iv. With reference to the functioning of eye, answer the questions that follow :
  - a. Name the two structures in the eye responsible for bringing about the change in the shape of the lens.
  - b. Name the cells of the retina and their respective pigments which get activated (1) in the dark (2) in light. 2M
- v. Draw neat and labelled diagram of the following L.S of kidney 3M

**Question 6**

- i. Define Plasmolysis 1M
- ii. Simple goitre is usually seen in people living in the hilly regions. Give two reasons for the statement. 2M
- iii. Do you think urbanization is eco-friendly? Give reasons for your answer. 2M

iv. State the two features of Australopithecus. 2M

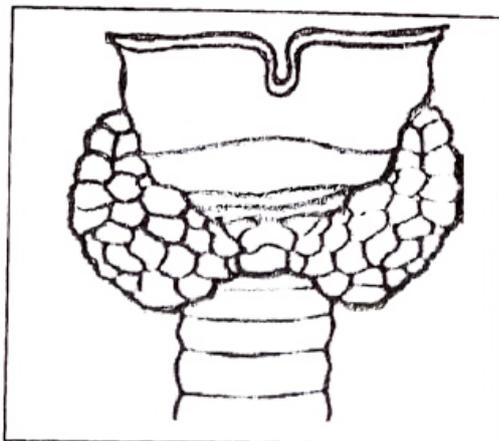
v. The diagram below represents the structure found in the inner ear. Study the same and then answer the questions that follow : 3M



- Name the parts labelled A and D.
- Which part of the ear is responsible for transmitting impulses to the brain.
- Name the audio receptor cell present in the above picture.

**Question 7**

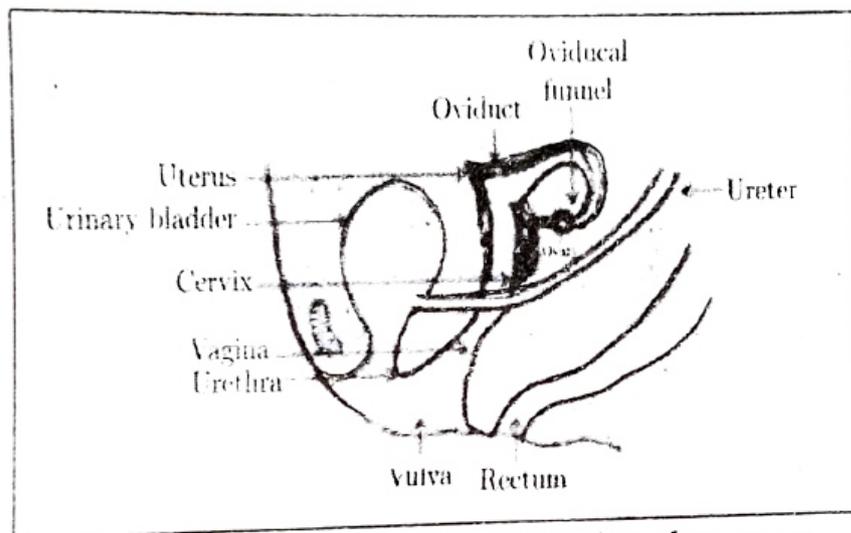
- In some xerophytes leaves are modified into spines. Justify 1M
  - What is shape of the lens during (1) near vision (2) distant vision ? 2M
  - Give characteristic features of *Homo Erectus* based on Cranial capacity and Development of Chin 2M
  - Suggest any two methods of controlling automobile pollution. 2M
- v. Ashok is learning about the human endocrine system and is presented with a diagram showing the location and structure of a specific endocrine gland. Based on the diagram and his studies, answer the following detailed questions: 3M



- Name the endocrine gland shown in the diagram.
- Name the secretion of the gland which regulates basal metabolism.
- Name the mineral element required for the synthesis of the above mentioned hormone.

**Questions 8**

- i. What was the cranial capacity of Homo erectus ? 1M
- ii. State any two harmful effects of acid rain. 2M
- iii. A fully grown human embryo respire but does not breathe. Why ? 2M
- iv. Name two surgical techniques for male and female that are used to prevent pregnancy. 2M
- v. **Ramesh was studying a diagram of the female reproductive system in his biology class. His teacher asked him to identify specific parts of system.** 3M



- 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.

\*\*\*\*\*

## Question Paper 16



### Cathedral and John Connon School

#### Preliminary Examination

Sub: Biology

Marks: 80

Std: X

Time: 2 hrs

Date: 07-01-2026

**Instructions:**

*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.*

*The intended marks for questions or parts of questions are given in brackets [ ].*

*Section A is compulsory. Attempt any four questions from Section B.*

*No of printed sides = 7*

#### Section A [40 marks]

(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 answers only.**

- (i) A pair of corresponding chromosomes of the same shape and size having genes of the same characters, one from each parent are \_\_\_\_\_.
- (a) Karyotype  
(b) Homologous  
(c) Alleles  
(d) Traits
- (ii) Bella saw her grandmother add a lot of salt to the raw mango pieces while making pickles. Her grandmother told her that this was to prevent spoilage of the pickle. Which biological process/ processes will prevent the growth of the spoiling bacteria?

1. Exosmosis

2. Plasmolysis

3. Endosmosis

4. Flaccidity

- (a) Only 1  
(b) 1 and 2  
(c) Only 3  
(d) 1, 2 and 4

(iii) **Assertion (A):** Testes produce sperms.

**Reason (R):** Sperms are produced at a temperature  $2^{\circ}\text{C}$  to  $3^{\circ}\text{C}$  higher than that of the body.

- (a) A is True and R is False
- (b) A is False and R is True
- (c) A and R are true and R is the correct explanation for A
- (d) A and R are true but R is not the correct explanation for A

(iv) The cell organelles which can undergo division are \_\_\_P\_\_\_ and \_\_\_Q\_\_\_ .

- (a) P - Mitochondria; Q - Ribosomes
- (b) P - Vacuoles; Q - Mitochondria
- (c) P - Golgi bodies; Q - Chloroplast
- (d) P - Mitochondria; Q - Chloroplast

(v) Which of the following occurs in interphase?

- (a) Division of Nucleus
- (b) Division of centrosome
- (c) Synthesis of RNA
- (d) Synthesis of cellulose

(vi) Simon was not able to see the road clearly while driving. His optician gave him corrective lens which helped to eliminate the problem. Name the problem and the corrective lens.



- (a) Myopia and Convex lens
- (b) Myopia and Concave lens
- (c) Hyperopia and Convex lens
- (d) Cataract and Convex lens

(vii) **Assertion (A):** Leaves of Banyan tree have thick cuticle.

**Reason (R):** Banyan trees grow in hot dry regions.

- (a) A is True and R is False
- (b) A is False and R is True
- (c) A and R are true and R is the correct explanation for A
- (d) A and R are true but R is not the correct explanation for A

(viii) 4 students were making a model based on Watson and Crick's work. They were trying to match the given molecules to form a double stranded helical strand as in the table given below. Which student will be able to make the correct model?

	Base 1 and 2	Base 3 and 4	Core
Ron	A-G	G-C	8 histone proteins
Susan	A-A	C-C	1 histone proteins
Carol	A-T	C-G	4 histone proteins

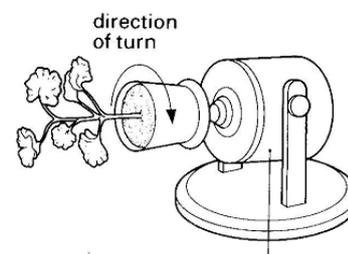
Dennis	A-T	C-G	8 histone proteins
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- (ix) Rekha gets her children vaccinated for human papillomavirus which can cause genital warts. Post the vaccine when a blood test is taken, the antibody content is found to be high. Which WBC will be in high numbers in their blood?
- Monocytes
  - Neutrophils
  - Lymphocytes
  - Basophils
- (x) The Islets of Langerhans secrete the hormones
- Insulin and somatotropin
  - Insulin and glucagon
  - Insulin and stomata
  - Insulin and glucose
- (xi) Assertion (A): We cannot move the pinna to gather sound.  
Reason (R): Pinna muscles are vestigial organs which have ceased to be of use to humans.
- A is True and R is False
  - A is False and R is True
  - A and R are true and R is the correct explanation for A
  - A and R are true but R is not the correct explanation for A
- (xii) The number of live births per \_\_\_\_\_ people of population per year is called \_\_\_\_\_.
- 1000, Birthing
  - 100, Natality
  - 100, Mortality
  - 1000, Natality
- (xiii) Assertion (A): Thermal pollution is caused by oil refineries.  
Reason (R): Thermal pollution causes global warming.
- A is True and R is False
  - A is False and R is True
  - A and R are true and R is the correct explanation for A
  - A and R are true but R is not the correct explanation for A
- (xiv) Which of the following is **not** a character of the pea plant studied by Mendel?
- Pod colour
  - Seed shape
  - Flower colour
  - Plant diameter

(xv)

The clinostat shown here is used to demonstrate

- Geotropism
- Hydrotropism
- Phototropism
- Thigmotropism



**Question 2**

[5]

i) Name the following:

- (a) An enzyme in tears.
- (b) Structure that holds the apices of the tricuspid and bicuspid valves in position.
- (c) Very long and thin, darkly stained fibres seen under the electron microscope, in a non-diving cell.
- (d) Cleanliness campaign launched by our PM on 2nd October 2014.
- (e) Substances passed into forming urine by tubular secretion.

ii) Given below is the diagram of the membranous labyrinth. Observe the given diagram and fill in the blanks.

[5]



The inner ear or membranous labyrinth has two main parts - the \_\_\_\_\_ (a) \_\_\_\_\_ which is spiral shaped and looks like a snail shell and the \_\_\_\_\_ (b) \_\_\_\_\_ which are arranged at right angles to each other in three different planes. The inner winding cavity of (a) is divided into three parallel canals, of which the median canal is filled with \_\_\_\_\_ (c) \_\_\_\_\_. The median canal contains areas possessing sensory cells called \_\_\_\_\_ (d) \_\_\_\_\_ for hearing. The nerve fibres arising from these cells are bundled to form \_\_\_\_\_ (e) \_\_\_\_\_.

iii) Given below are 5 sets having four terms each. Choose the odd one from each set and state the category of the other three.

[5]

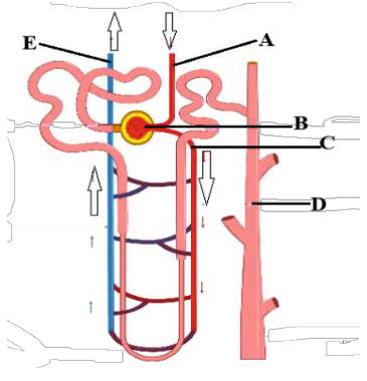
- (a) Acid rain, Global warming, Bharat norms, Ozone depletion
- (b) Albinism, Diabetes insipidus, Colour blindness, Haemophilia
- (c) Hydathodes, Cuticle, Lenticels, Stomata
- (d) Axon, Cyton, Dendron, Synapse
- (e) Phagocytosis, Inflammation, Antibody production, Clotting

iv) Ram went for his annual health check up. When he told his daughter about it, she asked the following questions related to his heart. Help him to answer the questions:

[5]

- (a) Where is the heart located?
- (b) What sounds does the heart make that the doctor could hear?
- (c) Which structure commands the heart to beat at a normal pace?
- (d) Which blood vessel must be clear of blockage to ensure that he doesn't have a heart attack?
- (e) What protects the heart from mechanical injuries?

- v) Given below is the diagram of the structural and functional unit of the human urinary system. Match the structures marked A to E with the correct given description. [5]

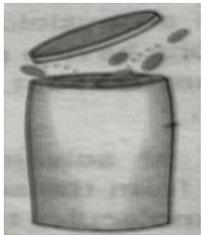
Diagram	Description
	(1) Content of this structure has the most urea
	(2) Content of this structure has the least oxygen
	(3) This structure has a smaller diameter
	(4) This structure contains urine
	(5) The content in this structure is under high pressure

**SECTION B**  
(Attempt any four questions from this section)

**Question 3**

- (i) Explain the term Crossing over. [1]  
 (ii) Give two differences between Cretinism and Myxoedema. [2]

(iii)

<p>Susan packed a can with dry <i>moong dal</i> seeds.            Due to a pipe leakage, her kitchen got flooded and water entered inside the tin.</p>		<p>(a) Define the phenomenon that caused the lid of the can to burst open?             (b) What precaution should she have taken to avoid this situation?</p>
<p>After a few days, she saw the lid of the can had burst open.</p>		

- (iv) State two applications of Mendel's Laws. [2]  
 (v) Draw a well labelled diagram of the chloroplast. [3]

**Question 4**

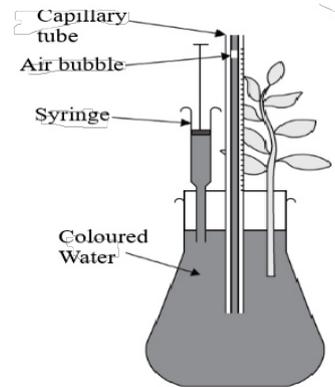
- (i) What is Ovulation? [1]  
 (ii) Give any two effects of Adrenaline on the circulatory system. [2]  
 (iii) State the location of (a) Yellow spot (b) Epididymis [2]

(iv) Differentiate between the location of axon and cyton of the neurons in the brain and in the spinal cord. [2]

(v)

Observe the diagram of the bubble potometer and answer the questions that follow.

- Name a suitable plant that can be used for this experiment.
- What change do you expect to see in the position of the bubble after a few hours?
- Explain any one precaution that should be taken while cutting the twig?
- What is the role of the syringe in this set-up?



### Question 5

- What is the importance of forests in supporting life on earth? [1]
- The root hair is well adapted for absorption of water from soil. Give two reasons to support this statement. [2]
- Given below are sets of five terms. Rearrange and rewrite them in the proper sequence: [2]
  - Epididymis, seminiferous tubule, urethra, vas deferens
  - Snake, Frog, Bee, Hibiscus plant, Eagle.
- Explain the relationship between the pituitary gland and urine output. [2]
- Answer the questions related to the use of chemicals in agriculture as shown below: [3]



- Fertilizers help the crops to grow. What is the negative effect of fertilizers on other living organisms?
- Pesticides kill pests in the farm. How do pesticides adversely affect the soil?
- Name two sources of radiation pollution.

### Question 6

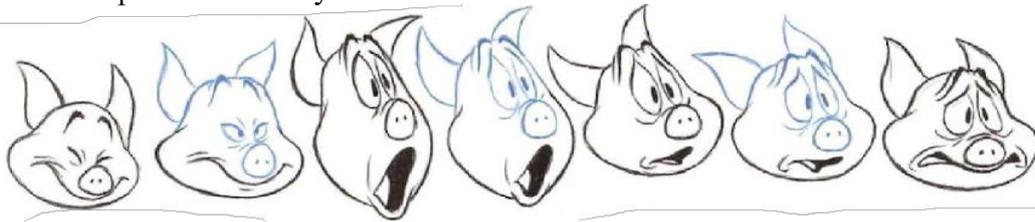
- Define Genes. [1]
- Brown eye colour is dominant over blue eye colour. Use a punnett square to predict the possibility of a couple of brown eyed parents having a blue eyed child? [2]



- Observe the given pictures of Australopithecus. Describe any two identifying facial features visible in both the pictures. [2]
- Give the scientific reason why well watered plants wilt in the afternoon. [2]
- Draw a neat labelled diagram of a meristematic cell in Anaphase. [3]

**Question 7**

(i) Define Population density. [1]



(ii)

Explain the biological concept used by Walt Disney to make cartoon motion pictures, as shown above. [2]

(iii) Expand the following abbreviations: [2]

(a) ACTH

(b) GA3

(iv) Name any two methods of contraception that can be adopted by males. [2]

(v) Draw a diagram of the stomatal apparatus and clearly show **ONLY** the described parts. [3]

[Ensure to write the question number 1, 2 and 3 next to the respective label.]

1. Part which produces glucose

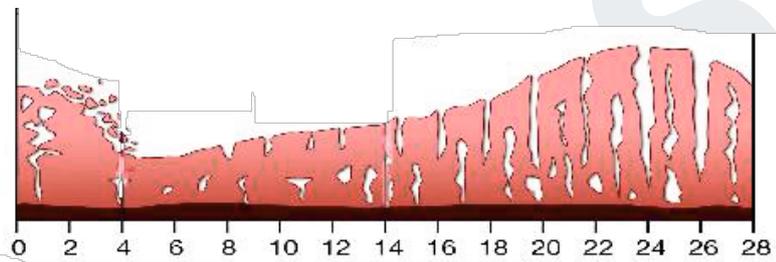
2. Part that bulges outward when cell is turgid

3. Part that allows diffusion of gases in and out of the leaf

**Question 8**

(i) Define Photolysis. [1]

(ii)



The graph shown above represents Susan's menstrual cycle. [2]

(a) On which day/s is it most unlikely that fertilization will occur and Susan will not get pregnant?

(b) Explain the reason for the answer you have given in (a).

(iii) What causes the leaves of the *Mimosa pudica* to droop when touched? Give another example of this type of response. [2]

(iv) Manohar lives near a busy traffic junction. What possible effects will be seen on his mental health due to this location? [2]

(v) Classify the following actions as Voluntary action or Inborn Reflex action or Conditioned reflex action: [3]

(i) Blinking of eyes when going out of a dark movie hall.

(ii) Standing up to sing the "Happy Birthday" song for a friend.

(ii) Stray dog standing near you runs away when you bend down to pick up your dropped phone.

SET -B  
PAWAR PUBLIC SCHOOL, CHANDIVALI  
SECOND PRELIMINARY EXAMINATION (2025-2026)  
SUBJECT: BIOLOGY



MARKS: 80  
TIME: 2 HOURS

GRADE: 10  
DATE: 30.01.2026

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 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.*  
*The intended marks for questions or parts of questions are given in brackets [ ].*

**This Paper consists of 6 printed pages.**

**SECTION A (40 Marks)**  
(Attempt all questions from this Section.)

**Question 1**

[15]

Select the correct answer to the question from the given options.

(Do not copy the question. Write the correct answer only.)

- (i) A prehistoric human species is found to have hunted animals, used fire, and made simple stone tools. Which species is being described?  
(a) Homo habilis (b) Homo erectus (c) Homo sapiens (d) Neanderthals
- (ii) In a population of beetles, green-colored beetles are easily seen by predators, while brown-colored beetles blend with the soil and survive to reproduce. Over many generations, the population has mostly brown beetles. This phenomenon is an example of \_\_\_\_\_.  
(a) Gene (b) Mutation (c) Adaptation (d) Industrial melanism
- (iii) A botanist observes a plant with variegated leaves, where some parts are green and others white. She measures photosynthetic activity and finds it lower in the white areas. Which of the following conclusions is correct?  
(a) The white areas contain chlorophyll and perform photosynthesis efficiently.  
(b) The green areas contain chlorophyll and are responsible for most photosynthesis, while the white areas lack chlorophyll.  
(c) Both green and white areas perform photosynthesis equally, but the white areas store more starch.  
(d) The variegation occurs due to excess chlorophyll in the white areas.
- (iv) The water used in an iron industry to cool down hot metal is discharged into a nearby river. This type of pollution is called \_\_\_\_\_.  
(a) Thermal pollution (c) Radioactive pollution  
(b) Chemical pollution (d) Noise pollution
- (v) **Assertion (A):** The scrotum maintains a temperature for the testes slightly lower than the body temperature.

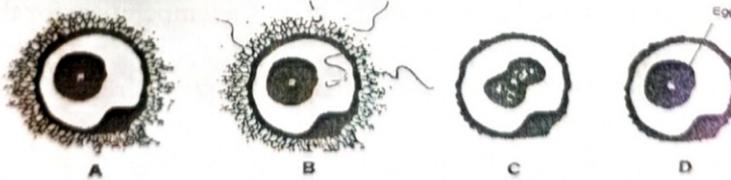
**Reason (R):** Sperm production requires a temperature lower than the normal body temperature of 37°C.

- (a) (A) is true and (R) is false.  
(b) (A) is false and (R) is true.  
(c) Both (A) and (R) are true and (R) is the correct explanation of (A).  
(d) Both (A) and (R) are true but (R) is not the correct explanation of (A).
- (vi) The colour of human eyes is determined by the presence of a pigment called \_\_\_\_\_.  
(a) Melanin (b) Haemoglobin (c) Carotene (d) Chlorophyll

PPSC/25-26/IIT/10/BIO/SPE

...2...

- (vii) In humans, free earlobes (F) are dominant over attached earlobes (f). A heterozygous person with free earlobes marries a person with attached earlobes. What is the expected phenotypic ratio of their children?  
 (a) 3 free : 1 attached (c) All free earlobes  
 (b) 2 free : 2 attached (d) All attached earlobes
- (viii) Which one of the following is not a component of a nucleotide?  
 (a) Nitrogenous base (b) Phosphate group (c) Pentose sugar (d) Amino acid
- (ix) When a cut is made on a sugarcane stem, liquid oozes out, especially in the early morning. The pressure responsible for this is \_\_\_\_\_.  
 (a) transpiration pull (c) root pressure  
 (b) osmotic pressure in leaves (d) capillary action in xylem
- (x) A plant is placed in a controlled environment where light comes only from the left side. An experiment is performed:  
 1. In one set, the tip of the coleoptile is removed, and the plant does not bend toward the light.  
 2. In another set, the tip is removed and replaced with a cotton pellet soaked in auxin solution, and the plant bends toward the light.  
 Which of the following statements correctly explains the role of auxin in phototropism?  
 (a) Auxin promotes elongation only on the side away from light, causing bending toward the light.  
 (b) Auxin is synthesised in the leaves and moves randomly, causing uniform growth.  
 (c) Auxin inhibits cell elongation on the shaded side, leading to bending away from light.  
 (d) Auxin is not involved in phototropism; bending is caused by differential water absorption.
- (xi) A scientist observes that the hyphae of a fungus grow toward areas with higher sugar concentration in a petri dish. This phenomenon demonstrates:  
 (a) Phototropism – growth toward light  
 (b) Geotropism – growth influenced by gravity  
 (c) Chemotropism – growth toward chemical stimuli  
 (d) Hydrotropism – growth toward water
- (xii) A child in a coastal area is given an iodine-enriched diet, but the thyroid gland still does not function properly. The person shows swelling in the neck. The disorder is \_\_\_\_\_.  
 (a) goitre (c) myxoedema  
 (b) cretinism (d) Addison's disease
- (xiii) In humans, a normal somatic cell contains 46 chromosomes, including a pair of sex chromosomes. If an abnormal gamete contains 24 chromosomes instead of 23 and fuses with a normal gamete, which of the following is most likely regarding the zygote?  
 (a) The zygote will have 47 chromosomes and may develop as male or female.  
 (b) The zygote will have 45 chromosomes and develop as a female.  
 (c) The zygote will have 46 chromosomes and always develop as a female.  
 (d) The zygote will have 48 chromosomes and develop as a male.
- (xiv) Examine the diagram alongside illustrating stages in human fertilisation. Arrange the stages in their correct chronological sequence.  
 (a) D, B, A, C (c) D, C, B, A  
 (b) D, A, C, B (d) A, B, C, D



PPSC/25-26/117/10/1310/SPE

(xv) Match the methods of population control in Column I with their correct descriptions in Column II. ...3...

Column I

1. Vasectomy
2. Tubectomy
3. Intrauterine device (IUD)
4. Physical barriers

(a) 1-B, 2-D, 3-A, 4-C

(b) 1-D, 2-B, 3-C, 4-A

Column II

- A) A contraceptive method placed in the uterus to prevent fertilisation
- B) Surgical removal/cutting of the vas deferens in males
- C) Use of condoms or diaphragms to prevent sperm from reaching the egg
- D) Surgical removal/cutting of the fallopian tubes in females

(c) 1-B, 2-C, 3-A, 4-D

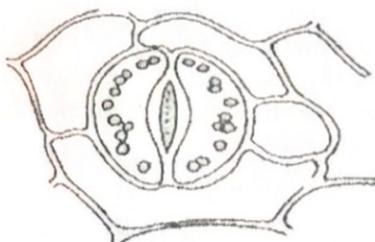
(d) 1-C, 2-D, 3-B, 4-A

**Question 2**

(i) Write the biological / technical terms for the following: [5]

- (a) The initiation of cyclic endometrial shedding, marking the attainment of reproductive maturity in an adolescent female.
- (b) A densely coiled network of capillaries intricately enclosed within the Bowman's capsule.
- (c) A waxy layer secreted by the epidermis on the two surfaces of the leaf.
- (d) A fluid that occupies and permeates the median canal of the membranous labyrinth.
- (e) A specialised group of epithelial cells connected to sensory nerve endings that detect stimuli and transduce them into nerve impulses.

(ii) Given below is the diagram of a human eye. Read the information below the diagram and fill in the blanks. [5]



The structure represented above plays a vital role in gaseous exchange and transpiration in plants. It consists of specialised cells that regulate stomatal opening and closing in response to environmental conditions.

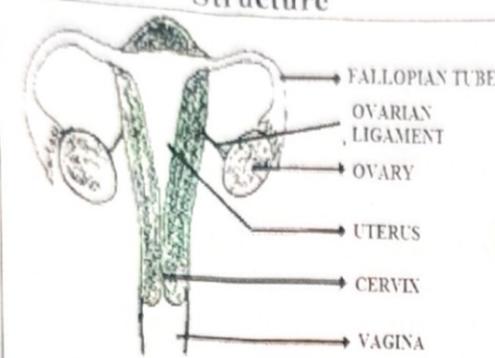
Each stoma is surrounded by two (a) \_\_\_\_\_ (guard cells / companion cells) that control its aperture. The turgidity of these cells is influenced by the movement of (b) \_\_\_\_\_ (water / carbon dioxide) in and out of them. The inner wall of each guard cell is (c) \_\_\_\_\_ (thicker / thinner) than the outer wall, allowing the stoma to open when turgid. In dicot leaves, the guard cells are (d) \_\_\_\_\_ (kidney-shaped / dumbbell-shaped). The guard cells, along with surrounding subsidiary cells, together form the (e) \_\_\_\_\_ (stomatal apparatus / lenticel).

(iii) Choose the odd term out from each of the following set of terms. Mention the category to which the remaining three belong. [5]

- (a) Cell wall, Centrosome, Plastids, Larger vacuoles
- (b) Crossing over, Chiasma, Recombination, Growth
- (c) Rubber sheet, Visking bag, Egg membrane, Cellophane paper
- (d) Metallic can, Glass, Styrofoam, Dung
- (e) Prolactin, Luteinizing hormone, Thyroid-stimulating hormone, Oxytocin

- (iv) Divya, a Grade 10 student, performed an experiment in her Biology lab to test the presence of starch in a leaf after photosynthesis. She carefully followed the steps shown by her teacher. Help Diya answer the following questions:
- Why is the leaf first boiled in water during the starch test?
  - Why is the boiled leaf then placed in alcohol and heated in a water bath?
  - What is the purpose of rinsing the decolourised leaf in warm water?
  - Which chemical reagent is added to the leaf to test for the presence of starch?
  - What colour change confirms that starch is present in the leaf?

- (v) Study the diagram given below and match the structure with its function: Example: Ovarian Ligament - (f)

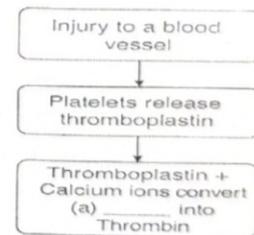
Structure	Functions
	<ol style="list-style-type: none"> <li>Serve as the site of fertilisation.</li> <li>Passage for sperm entry into the uterus.</li> <li>Secretes female sex hormones, oestrogen and progesterone</li> <li>Acts as the birth canal during parturition.</li> <li>Support implantation and sheds during menstruation if fertilisation does not occur.</li> <li>It holds the ovary in position and connects it to the uterus</li> </ol>

**SECTION B (40 marks)**

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

**Question 3**

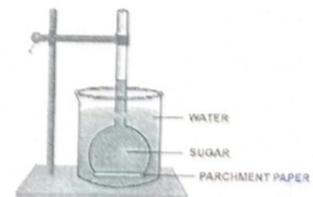
- Write an example of a tropic hormone. [1]
- Tina was surprised to notice that whenever a tiny dust particle accidentally entered her eye, tears started rolling down. Curious about this reaction, she asked her teacher why this happens. If you were her teacher, how would you explain the role of tears in protecting the eyes? (Any two points) [2]
- Study the flowchart given alongside and answer the following questions: [2]
  - Identify and name (1) in the given flow chart.
  - Name the essential fat-soluble vitamin which is required for blood clotting.



Which structural modification is seen in the given alongside plant that helps in reducing the loss of water and explain how it functions? [2]

- (v) Study the experimental setup shown alongside and answer the following questions: [3]

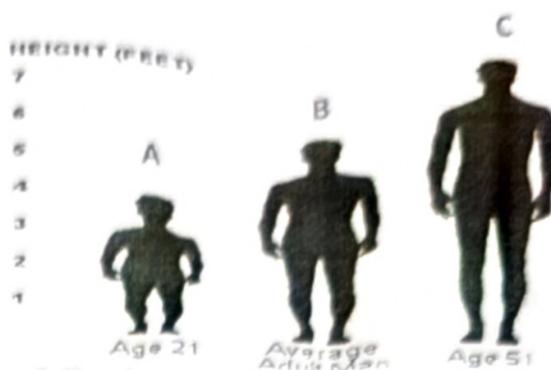
- Identify the physiological process being demonstrated in the experimental setup and define it in scientific terms.
- State the specific observation that validates the occurrence of the identified process in the setup.
- What will be the outcome if the concentrated sugar solution inside the thistle funnel is replaced with water, similar to that present in the beaker? Explain it with a reason.



**Question 4**

- While you are reading this question, the image is formed on a specific part of your retina that helps you see the text clearly. Name this region. [1]
- Despite being seven months pregnant, Egyptian fencer Nada Hafez competed in the Paris 2024 Olympics. How did the amniotic fluid help protect and support the developing foetus during her physical activity? [2]

(iii) Study the figures given alongside and answer the following questions:



- (a) Which one of the figures given alongside is suffering from hyposecretion of the growth hormone?
- (b) Name the disorder shown in Figure C.

[2]

(iv) Study the diagram given alongside and answer the following questions.



- (a) Identify and name the stage of a cell division shown alongside, providing an appropriate scientific reason for your answer.
- (b) Draw a well labelled diagram of the previous stage as per your answer for Q.4 (iv) (a).

[2]

(v) Mendel, while working in his pea garden, decided to study two contrasting traits together — seed shape (round and wrinkled) and seed colour (yellow and green). He crossed a pure round yellow-seeded pea plant (RRYY) with a pure wrinkled green-seeded pea plant (rryy) to understand how traits are inherited in combination.

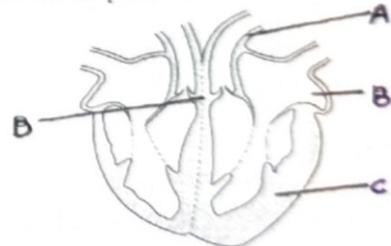
[3]

- (a) Based on Mendel's experiment, what will be the genotype of the F<sub>1</sub> generation?
- (b) When the F<sub>1</sub> plants are self-pollinated, represent the gametes formed that give rise to the F<sub>2</sub> generation.
- (c) State the phenotypic ratio obtained in the F<sub>2</sub> generation of this dihybrid cross.

**Question 5**

- (i) State Mendel's Law of dominance. [1]
- (ii) During a DNA analysis experiment, a student observed that the percentage of adenine (A) in a sample was 30%. [2]
  - (a) Using the principle of base pairing, determine the percentage of thymine (T), guanine (G) and cytosine (C).
  - (b) During which phase of the cell cycle does DNA replication take place?

(iii) Study the diagram given alongside carefully and answer the following questions:



[2]

- (a) During vigorous physical exercise, the heart rate increases. Based on the given diagram, explain how the chambers labelled B and C work together to ensure efficient oxygen supply to the body.
- (b) In a medical case of valve malfunction, blood flows backward from the chamber labelled C to B. Identify and name the valve that might be defective.

(iv) One morning, Riya stepped out of her dark bedroom into bright sunlight. Instantly, she felt a sharp glare and noticed her pupils became smaller after a few seconds.

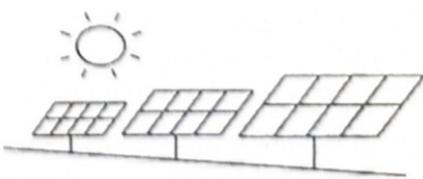
[2]

- (a) Identify and define the type of response shown by Riya's eyes.
- (b) Identify the effector in the given case.

(v) Draw a neat and a well labelled diagram of the Malpighian capsule. [3]

**Question 6**

(i) Based on the diagram of a solar panel shown alongside, identify one sustainable domestic practice that uses the energy produced by this device. [1]



(ii) State any two functions of the placenta other than its endocrine nature. [2]

- (iii) A patient suffering from severe cholera experiences prolonged diarrhoea and dehydration. Over time, the patient develops swelling, reduced urine output and fatigue. [2]
- (a) Name the complication that has developed due to cholera.
- (b) Explain how severe cholera can lead to this complication. [2]
- (iv) Differentiate between the following terms based on the parameters given in the brackets. [2]
- (a) Erythrocyte and Leucocyte (Shape)
- (b) Artery and Vein (Lumen)
- (v) Draw a neat and a well labelled diagram of a T.S. of an artery and a vein. [3]

**Question 7**

- (i) Name the three major steps of the urine formation in sequence. [1]
- (ii) Sita and Geeta were born on the same day, but look different in appearance and have different blood groups. [2]
- (a) What type of twins are Sita and Geeta?
- (b) Write one scientific reason for your answer written for Q.7 (ii) (a).
- (iii) Anshikā loves dancing. While practicing, she remembers the steps and coordinates her body movements perfectly. Later, she sits and solves a difficult puzzle. [2]
- (a) Name the part of the brain that helps remember dance steps and solve puzzles.
- (b) Which part of the brain coordinates Anshika's body movements while dancing?
- (iv) Global temperatures are rising due to the increasing concentration of greenhouse gases in the atmosphere. As a result, glaciers and polar ice caps are melting, causing sea levels to rise. This leads to flooding in coastal areas and disrupts weather patterns. Scientists warn that if global warming continues, it will severely affect biodiversity and the balance of ecosystems. [2]
- (a) Explain any one major effect of global warming on the environment.
- (b) Suggest any one measure that can help reduce the effects of global warming.
- (v) Draw a neat and a well labelled diagram of a human sperm. [3]

**Question 8**

- (i) Explain diffusion. [1]
- (ii) Study the experimental setup given alongside and answer the following questions: [2]
- (a) Write an appropriate aim for the given experimental setup.
- (b) What will be your observation for the given experimental setup?
- 
- (iii) Explain why gamete formation occurs through meiosis rather than mitosis. [2]
- (iv) Study the diagram given alongside and answer the following questions: [2]
- (a) Identify and name the given chromosome.
- (b) Copy the given diagram in your answer sheet and label the centromere.
- 
- (v) Mita's grandfather noticed that some grape plants had small bunches and poor flowering. Mita suggested spraying a hormone that promotes stem elongation and fruit growth. [3]
- (a) Name the hormone Mita is referring to.
- (b) Write one more practical application of this hormone in agriculture.
- (c) Differentiate between the functions of auxins and cytokinins.



VILE PARLE MAHILA SANGH'S  
ORION SCHOOL [CISCE]

Preliminary Examination - 2 (2025-2026)

Grade: X

Time Duration: 2Hours.

Subject- Biology

Date: 19-01-2026

Max. Marks: 80

*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 for 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.*

*The intended marks for questions or parts of questions are given in brackets [ ]*

## SECTION-A (40 Marks)

*(Attempt all questions from this section.)*

### Question 1.

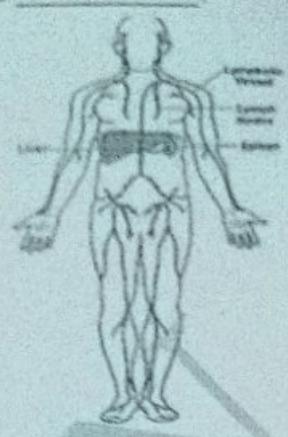
(A) Choose the correct answer and write the correct option.

[15]

- (i) During a medical checkup, it was found that the valves of Riya's heart are not closing properly. This condition may lead to:
- (a) Regular blood flow
  - (b) Backflow of blood
  - (c) Excess formation of RBC
  - (d) Higher oxygen transport
- (ii) A gardener applies a hormone to a bush to produce seedless grapes. Which hormone is responsible?
- (a) Auxin
  - (b) Cytokinin
  - (c) Gibberellin
  - (d) Abscisic acid
- (iii) Assertion (A): The rate of photosynthesis increases with light intensity.  
Reason (R): More light increases chlorophyll production in leaves.
- (a) (A) is true and (R) is false.
  - (b) (A) is false and (R) is true.
  - (c) Both (A) and (R) are true and (R) is the correct explanation of (A).
  - (d) Both (A) and (R) are true but (R) is not the correct explanation of (A).
- (iv) A patient cannot control his blood sugar level because his body is unable to produce sufficient insulin. Which endocrine gland is not functioning properly?
- (a) Thyroid
  - (b) Adrenal
  - (c) Pancreas
  - (d) Pituitary

(v) The diagram shows lymph vessels and nodes. The fluid flowing inside transports \_\_\_\_\_

- (a) Oxygen only
- (b) WBCs and nutrients
- (c) Digestive enzymes
- (d) Platelets only



(vi) While travelling in a fast-moving elevator, a child feels pressure in the ear. This is due to:



- (a) Damage to cochlea
- (b) Blockage of auditory nerve
- (c) Pressure change affecting Eustachian tube
- (d) Damage to tympanic membrane

(vii) Assertion (A): Thyroid gland controls the metabolic rate of the body.

Reason (R): Thyroxine regulates the breakdown of protein in cells.

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

(viii) During meditation, a person's breathing rate slows down. This change is controlled by the:

- (a) Cerebrum
- (b) Cerebellum
- (c) Medulla oblongata
- (d) Spinal cord

(ix) Fossils of Homo erectus suggest that they were the first human ancestors to:

- (a) Develop agriculture
- (b) Walk upright
- (c) Use fire and make tools
- (d) Build houses

(x) Which stage implants itself in the uterine wall?

- (a) Zygote
- (b) Gastrula
- (c) Blastocyst
- (d) Gamete

(xi) Which of the following is growth inhibiting hormone?

- (a) IAA
- (b) ABA
- (c) GA<sub>1</sub>
- (d) GA<sub>2</sub>

(xii) A zygote contains:

- (a) Only paternal chromosomes
- (b) Only maternal chromosomes
- (c) Double the haploid number
- (d) No chromosomes

(xiii) Cultural revolution favours a steep rise in human population. Identify the correct sequence of revolution:

- (a) Tool making, Scientific and Industrial, Agricultural
- (b) Agricultural, Tool making, Scientific and Industrial
- (c) Scientific and Industrial, Agricultural, Tool making
- (d) Tool making, Agricultural, Scientific and Industrial

(xiv) Sheetal was studying the role of reproductive hormones in females. Help her match the reproductive hormones with their correct functions:

Hormone	Function
P – FSH	(1) Maintains pregnancy
Q – LH	(2) Stimulates ovarian follicle growth
R – Progesterone	(3) Stimulates ovulation
S – Oxytocin	(4) Causes uterine contractions during childbirth

- (a) P-2, Q-3, R-1, S-4
- (b) P-3, Q-4, R-2, S-1
- (c) P-4, Q-1, R-2, S-3
- (d) P-1, Q-2, R-3, S-4

(xv) Reema can see far objects clearly but faces difficulty reading a book. This condition is corrected by:

- (a) Cylindrical lens
- (b) Convex lens
- (c) Concave lens
- (d) Prism lens

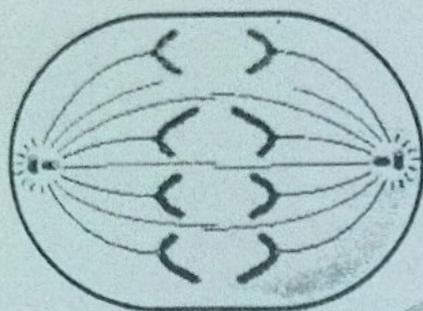
**Question-2**

[5]

(i) Name the following

- (a) Protein structure that organizes DNA into chromatin.
- (b) Hydrogen carrier substance in light reaction.
- (c) Inner ear fluid present in median canal of cochlea.
- (d) Layer of leaf which contains maximum chlorophyll.
- (e) The process by which WBCs squeeze through capillary walls into tissues.

(ii) Given below is the diagram of a mitotic cell. Read the information below the diagram and fill in the blanks: [5]



Mitosis helps in growth and repair of body tissues. In this stage, the chromosomes are arranged on the equatorial plate. The nuclear membrane disappears and the spindle fibres attach to the centromeres.

The stage shown is (a) \_\_\_\_\_. The two identical copies of a chromosome are called (b) \_\_\_\_\_. The structure that attaches chromatids to spindle fibres is (c) \_\_\_\_\_. Division of cytoplasm after nuclear division is known as (d) \_\_\_\_\_. DNA replicates during the (e) \_\_\_\_\_.

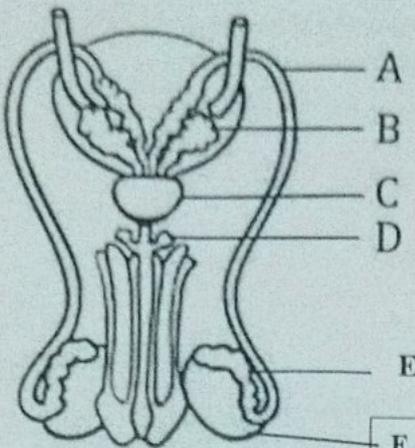
(iii) Choose the odd term out from each of the following set of terms. Mention the category to which the remaining three belong: [5]

- (a) Vas deferens, Epididymis, Fallopian tube, Seminiferous tubules
- (b) Auxin, ABA, Cytokinin, Gibberellins.
- (c) Zygote, Gamete, Ovum, Sperm.
- (d) Platelets, Neutrophils, Antibodies, RBC.
- (e) Diabetes, Goitre, Acromegaly, Pneumonia.

(iv) A boy injured his hand and bleeding stopped after some time. He had some queries related to the clotting. Help the boy by answering the questions. [5]

- (a) Which element helps in clotting?
- (b) Which protein forms threads in clot?
- (c) Name the anticoagulant present in human blood.
- (d) Which blood vessels carry blood away from heart?
- (e) Closing of which valve of the heart produces DUP sound?

(v) Given below is the diagram showing male reproductive system. Match structure (A) to (E) with their correct function. [5]

Structure	Function
	(i) Produces sperm
	(ii) Embryo, grows and develop during gestation
	(iii) Carries sperm in the abdominal cavity
	(iv) Secretes alkaline secretion
	(v) Act as lubricant for transportation of sperm
	(vi) Produces nutritive fluid for nourishing the sperm
	(vii) Stores sperms temporarily
	(viii) Produces Sperm ovum

**SECTION-B**

(40 Marks)

(Attempt any four questions from this Section.)

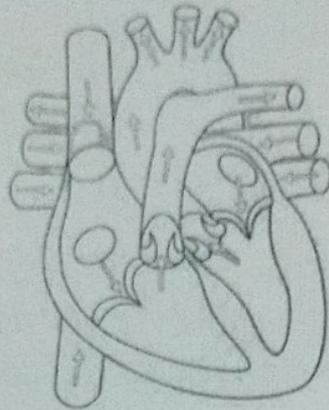
**Question 3**

- (i) Explain the term Gene. [1]
- (ii) Why is it necessary to place a plant in dark room for 24 to 30 hours before starting an experiment on photosynthesis? [2]
- (iii) State any two functions of Gibberellins. [2]
- (iv) During a science demonstration, blood oozed from Riya's finger and clotted after a while. [2]
  - (a) Which component helps in clotting?
  - (b) Name the protein threads that form the clot.
- (v) Draw neat and labelled diagram of Malpighian capsule. [3]

**Question 4**

- (i) What is Parthenocarpy? [1]
- (ii) Distinguish between Systole and Diastole. [2]
- (iii) Why does Renal cortex have dotted appearance and Renal medulla have striped appearance? [2]
- (iv) What is the significance of placenta in the growth of fetus? [2]

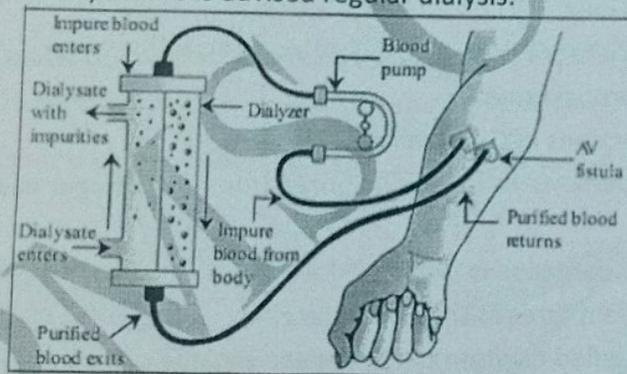
- (v) During a science fair, a model of the human heart was displayed. The guide explained that blood flows in one direction. [3]



- (a) Which structures in the heart ensure one-way flow of blood?  
 (b) Which side of the heart has oxygenated blood?  
 (c) Name the blood vessel that brings deoxygenated blood from body to the heart.

**Question 5**

- (i) Give the scientific name of pea plant used by Mendel for his experiments. [1]  
 (ii) What is the arrangement of cyton and axon in the brain and the spinal cord? [2]  
 (iii) State the location and a function of Leydig's cell. [2]  
 (iv) State any two methods that prevents fertilization of egg by sperm. [2]  
 (v) A patient with kidney failure is advised regular dialysis. [3]



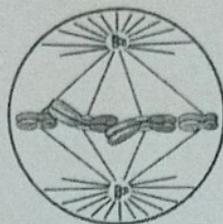
- (a) Which waste is removed during dialysis?  
 (b) Name the functional unit of kidney.  
 (c) Which process normally removes waste from blood in kidneys?

**Question 6**

- (i) Explain the term – Plasmolysis [1]  
 (ii) Mention any two significance of crossing over. [2]  
 (iii) Differentiate between Menarche and Menopause. [2]  
 (iv) How does endocrine glands different from exocrine glands? [2]  
 (v) A student cannot see objects clearly at night but sees well in daylight. [3]  
 (a) Name the defect.  
 (b) Which photoreceptor cells are defective?  
 (c) Which vitamin deficiency causes this?

**Question 7**

- (i) What is phototropism? [1]
- (ii) Why RBC donot have mitochondria and ~~mitochondria~~ <sup>nucleus</sup>? [2]
- (iii) What is the role of placenta during pregnancy? [2]
- (iv) Riya observed onion root tips under a microscope in her biology lab. She noticed chromosomes lined up at the equatorial plate. [2]



- (a) Name the stage of cell division she observed.
- (b) Which cell organelle helps in spindle fibre formation?
- (v) Draw neat and labelled diagram of a chloroplast. [3]

**Question 8**

- (i) State any one harmful effect of ozone layer depletion. [1]
- (ii) State and explain any two factors that leads to rise of population in India. [2]
- (iii) Mention any two points of difference between Homo erectus and Neanderthal man. [2]
- (iv) Why did Mendel select pea plant for his experiment on inheritance? [2]
- (v) A student performed an experiment by covering a part of a leaf with black paper and keeping the plant in sunlight. After the iodine test, only the uncovered part turned blue black. [3]
  - (a) Which factor required for photosynthesis was absent in the covered part?
  - (b) What substance is indicated by the blue-black colour?
  - (c) Name the organelle where photosynthesis occurs.

## Question Paper 19

PAWAR PUBLIC SCHOOL, HADAPSAR, PUNE  
PRELIMINARY EXAMINATION-II (2025-26)  
SUBJECT – BIOLOGY

Std.: X  
Date: 16/01/2026

Max Marks: 80  
Duration: 2 hours

*Answer to this Paper must be written on the paper provided separately.*

*You will not be allowed to write during first 15 minutes.*

*This time is to be spent 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.**

*The intended marks for questions or parts of questions are given in the bracket [ ].*

### SECTION A

(Attempt all questions from this Section)

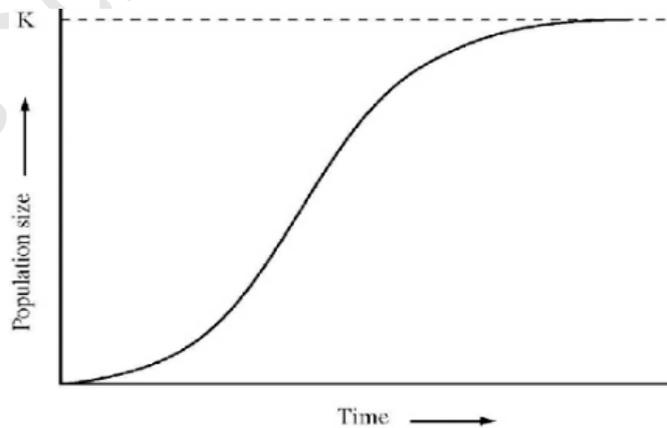
#### Question 1

Choose the correct answers to the questions from the given options.  
(Do not copy the question, write the correct answers only)

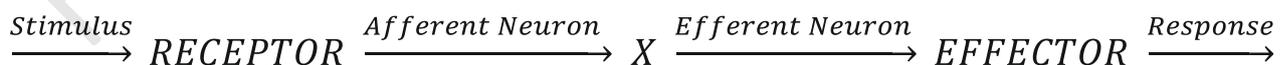
[15]

- (i) Rupesh was studying the population growth of a city. He observed the following growth curve. Identify its type:

- (a) S-shaped growth curve
- (b) Exponential growth curve
- (c) Zero population growth curve
- (d) L-shaped growth curve



- (ii) Consider the given flowchart for reflex action and identify X.



- (a) Brain
- (b) Spinal cord
- (c) Sympathetic Nervous System
- (d) Cranial Nerves

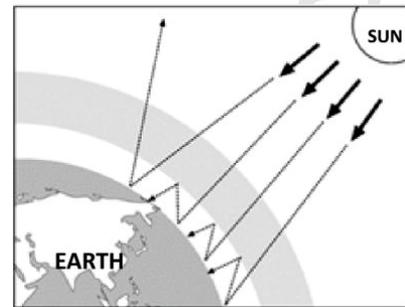
(iii) **Assertion (A):** Human ancestors never used their tails and that's why gene involved in expressing the character disappeared.

**Reason (R):** Lamarck's theory of evolution is popularly called theory of inheritance of acquired characters.

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

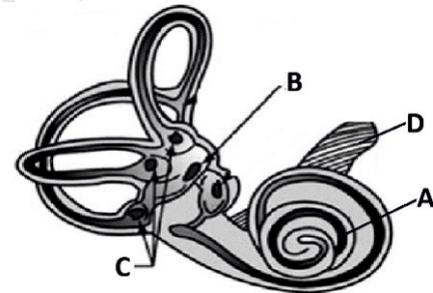
(iv) Identify the phenomenon depicted in the picture shown below.

- (a) Ozone depletion
- (b) Green-house effect
- (c) Tsunami
- (d) Acid Rain



(v) Observe the diagram and identify the correct structure-function pair.

- (a) A: Static balance
- (b) B: Dynamic balance
- (c) C: Hearing
- (d) D: Conduction of impulse to brain for listening



(vi) Ishita was solving the olympiad questions. Which of the following lobes of cerebrum is/are **NOT** involved in the process?

- 1. Occipital
- 2. Frontal
- 3. Parietal
- 4. Temporal

- (a) Only 1,2 and 3
- (b) Only 1 and 3
- (c) Only 4
- (d) Only 2

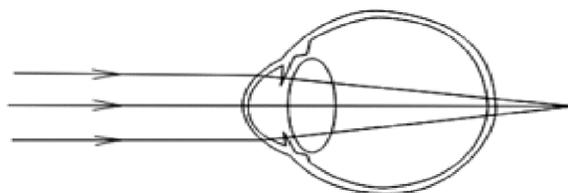
(vii) **Assertion (A):** Diabetes insipidus caused by the hyposecretion of Antidiuretic hormone, is marked by excessive urination and too much thirst of water.

**Reason (R):** The urine output is regulated by the hormone ADH which helps in absorption of water in the nephrons.

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

- (viii) The Sinoatrial Node (SAN) is often referred to as the "natural pacemaker" of the heart. Which of the following statements best describes its primary function and location?
- It is located in the left atrium and regulates blood pressure.
  - It is located in the right ventricle and pumps blood to the lungs.
  - It is a specialized mass of tissue in the right atrium that generates electrical impulses for heart contraction.
  - It is found near the apex of the heart and coordinates relaxation of the ventricles.

- (ix) Observe the diagram and identify the **INCORRECT** statement from the given options.



- The disorder shown is long sightedness- Hypermetropia.
  - It is corrected by the concave lens.
  - The person with this disorder has difficulty reading a book.
  - The power of the glasses used in this is always denoted with '+' sign.
- (x) A biology teacher asked her students to give two examples of vestigial organs in the human body.

**Ishaan said:** Wisdom teeth and pinna

**Aarav said:** Body hair and large intestine

**Akshit said:** Vermiform appendix and wisdom teeth

**Kuber said:** Pinna and Ossicles

Who were correct?

- Ishaan and Akshit
  - Ishaan and Aarav
  - Akshit and Kuber
  - Akshit and Aarav
- (xi) The process of conversion of ADP to ATP during photosynthesis is called:
- Photorespiration
  - Photolysis
  - Photophosphorylation
  - Phagocytosis

- (xii) **Assertion (A):** Colour-blindness affects males more than females.

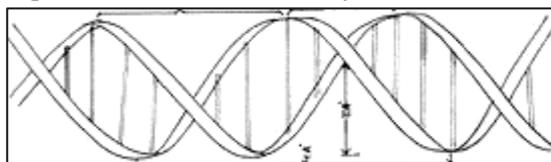
**Reason (R):** Males have only one X-chromosome, so any recessive allele on the X chromosome will be expressed.

- Both A and R are true, R is the correct explanation of A.
- Both A and R are true, R is not the correct explanation of A.
- A is True but R is False.
- A is False but R is True.

(xiii) A child has blood group AB (Genotype-  $I^A I^B$ ). Which one of the following parental blood group combinations could **NOT** possibly result in this child?

- (a) Mother is Group A, Father is Group B
- (b) Mother is Group AB, Father is Group A
- (c) Mother is Group A, Father is Group AB
- (d) Mother is Group AB, Father is Group O

(xiv) A sequence of double stranded DNA has 500 nitrogenous base pairs. If the number of Adenine present in the given DNA sequence is 180. How many Guanine must be present in it?



- (a) 320
- (b) 160
- (c) 80
- (d) 500

(xv) In cholera, patients suffer from diarrhoea and vomiting which causes severe dehydration. This condition may be fatal due to the:

- (a) Uremia
- (b) Kidney failure
- (c) Increased blood sugar levels
- (d) Excessive mental stress

## Question 2

(i) Give the biological/technical term for the following:

[5]

- (a) The disease caused by hyposecretion of thyroxine in children
- (b) The neuro transmitter released in the synaptic cleft.
- (c) The pigment responsible for the pale-yellow coloration of urine.
- (d) The alternate form of genes which code for different traits of the same character.
- (e) The sudden change in one or more genes or in the number or in the structure of chromosomes.

(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**.

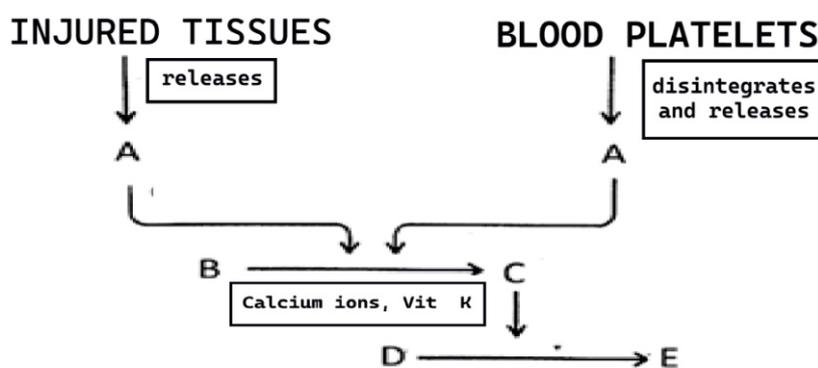
[5]

- (a) Vas deference, Seminal vesicles, Bulbourethral gland, Prostate gland
- (b) Menstrual Phase, Ovulatory phase, Follicular phase, Luteal phase
- (c) Glomerulus, DCT, PCT, Loop of Henle
- (d) SAN, Purkinje fibres, Bundle of His, AVN
- (e) Root hair, Cortex, Xylem, Pericycle

(iii) Choose the odd term out from each of the following set of terms. Mention the category to which the remaining three belong: [5]

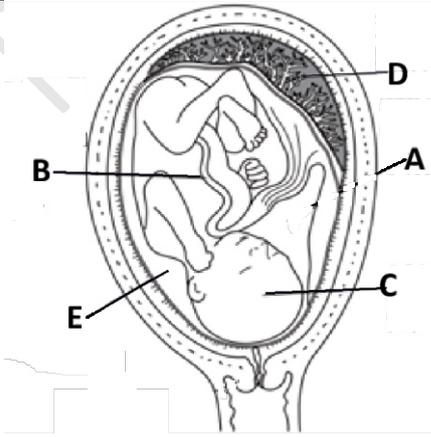
- (a) Sewage, Newspaper, Styrofoam, Hay
- (b) Cerebellum, Semi-circular canals, Vestibule, Cerebrum
- (c) Green pod, Terminal flower, Inflated pod, Round seed
- (d) Osmosis, Diffusion, Imbibition, Active transport
- (e) Adenine, Guanine, Thymine, Cytosine

(iv) Given below is the flowchart which depicts the series of reactions occurring during the blood coagulation process. Observe the flowchart and fill in the blanks: [5]



When an injury occurs, damaged tissue and platelets release a substance called \_\_\_\_\_ (A) \_\_\_\_\_. This enzyme is crucial for initiating the clotting cascade. In the presence of calcium ions and vitamin K, it converts the inactive plasma protein \_\_\_\_\_ (B) \_\_\_\_\_ into its active form, \_\_\_\_\_ (C) \_\_\_\_\_. It acts as a powerful enzyme, catalyzing the conversion of soluble plasma protein \_\_\_\_\_ (D) \_\_\_\_\_ into insoluble, thread-like strands of \_\_\_\_\_ (E) \_\_\_\_\_. These threads form a mesh that traps blood cells and platelets, ultimately forming a stable clot that seals the wound and prevents further blood loss.

(v) Given below is the diagram of the developing baby. Match the structure marked (A) to (E) with their correct functions. [5]

Developing baby	Function
	<ol style="list-style-type: none"> <li>(1) The muscular organ which provides support to the developing baby.</li> <li>(2) The connection between the foetus and the placenta, supplying nutrients and oxygen.</li> <li>(3) The developing baby inside the uterus.</li> <li>(4) The organ attached to the uterine wall, providing nourishment and waste removal for the foetus.</li> <li>(5) The protective fluid surrounding the foetus inside the amniotic sac.</li> </ol>

## SECTION B

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

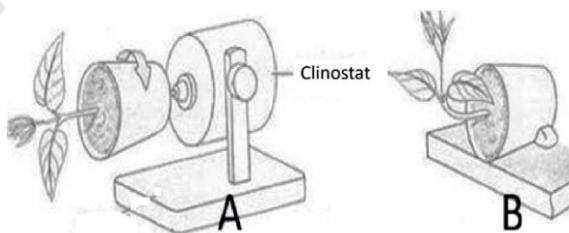
### Question 3

- (i) Name the gaseous compound which depletes the ozone layer. [1]
- (ii) Write the overall balanced reaction of photosynthesis. [2]
- (iii) Give the location of vitreous humour. What is its function? [2]
- (iv) Draw a punnet square to show the offspring produced by a couple: colour-blind father and a carrier mother. [2]
- (v) Pranaya observed a slide of mitosis under the microscope. She observed many cells with different arrangement of chromosomes in it. She observed a cell in which chromosomes were arranged on the centre as shown in the diagram. Based on the observations, answer the following questions. [3]
  - (a) Identify the phase.
  - (b) Draw a neat labelled diagram of the phase which precedes the given phase.
  - (c) Mention one significance of the mitosis.



### Question 4

- (i) Name the ions responsible for the conduction of nerve impulse. [1]
- (ii) Expand the abbreviation- ACTH and MTP. [2]
- (iii) Differentiate between LUBB and DUP sound produced during the heart beat based on the valves responsible and phase of the cardiac cycle it occurs. [2]
- (iv) A biology student sets up an experiment to demonstrate geotropism in a plant with a clearly visible shoot. They use two identical setups (A and B) in a dark room: [2]



Setup A: The plant is fixed horizontally onto a slowly rotating clinostat apparatus.

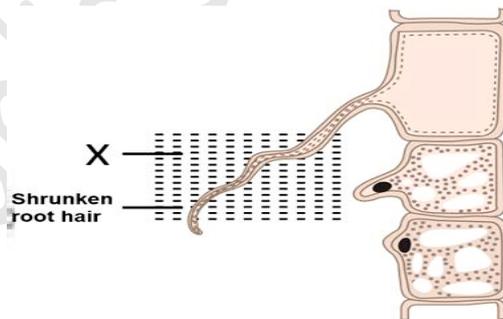
Setup B: The plant is fixed horizontally onto a stationary block on wood.

After three days, the student observes and compares the growth directions of the shoot in both setups. Identify the hormone, and how does the movement of clinostat cause the shoot to grow in the specific manner in the Setup A?

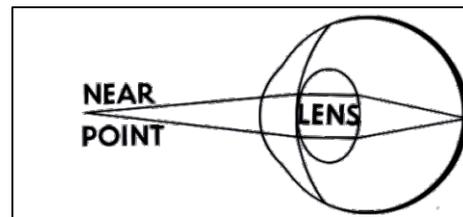
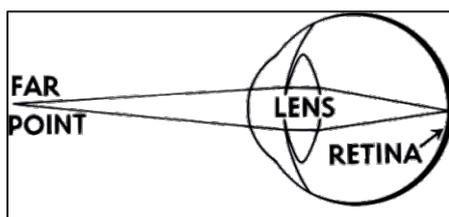
- (v) Draw a neat labelled diagram to show synapsis. [3]

### Question 5

- (i) Define Osmoregulation. [1]
- (ii) A horticulturist is experimenting with two identical plants, Plant X and Plant Y. [2]  
 Plant X is sprayed with a chemical that mimics the action of abscisic acid (ABA).  
 Plant Y is sprayed with a chemical that mimics the effects of gibberellins.
- (a) What is the impact on the stomata of the Plant X.
- (b) Describe the expected difference in height between Plant X and Plant Y after two weeks of normal watering and growth.
- (iii) The population of a village of Kodinhi, Malappuram district of Kerala is widely known for its unusually high birth rate of twins, often referred to as the “Twin Town” of India. Considering the population of the village to be 25000. If there are 2500 live births in a year and 500 deaths per year. Calculate: [2]
- (a) Natality
- (b) Mortality
- (iv) Below is the diagram of the root hair cell as it would appear when a concentrated solution of X is added near it. In general gardening practices, substance X is commonly spread on soil to enhance plant growth. [2]



- (a) Identify X.
- (b) Explain the reason for the shrinking of the root hair.
- (v) Study the picture given below and answer the questions: [3]



- (a) Identify the process shown in the diagram.
- (b) Name the muscles which changes the shape of the lens.
- (c) Blind spot is the site of no vision. Justify.

**Question 6**

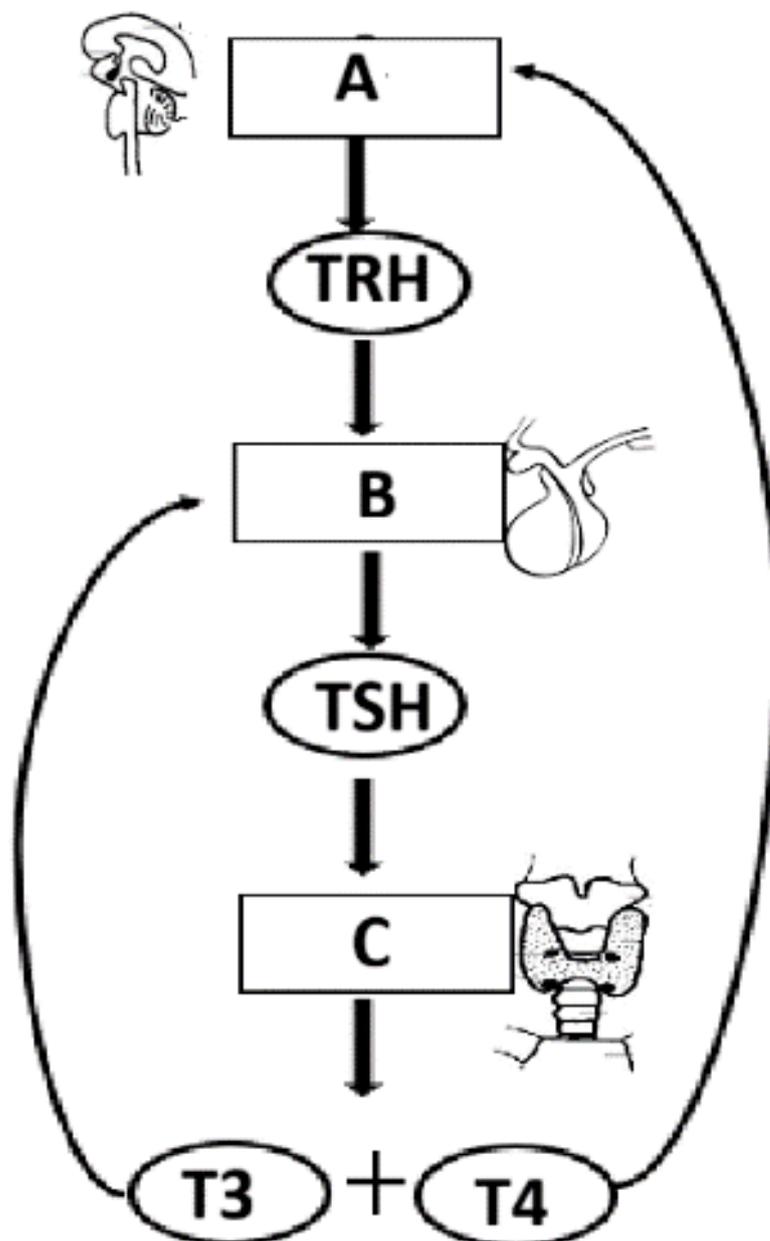
- (i) Define – Micturition. [1]
- (ii) Give the scientific name of the organism used as an example for ‘Industrial Melanism’.  
How does industrial melanism correlate with Darwinism? [2]
- (iii) A botanist is cultivating two identical plants, Plant A and Plant B, in a controlled greenhouse environment. Both plants are watered equally, but they are kept in different chambers. Chamber A has a temperature of 25°C and 80% humidity. Chamber B has a temperature of 35°C and 40% humidity. After a week, the botanist observes that Plant B shows signs of wilting, while Plant A appears healthy and turgid. Justify the condition of Plant A and Plant B. [2]
- (iv) During his experiments, Mendel performed a cross between a purple-flowered pea plant and a white-flowered plant. All the offspring in the F1 generation had purple flowers. [2]
- (a) Determine the phenotypic ratio of the offspring in the F2 generation when the F1 generation is self-pollinated.
- (b) Which of Mendel's laws explains why the recessive white flower trait, hidden in the F1 generation, re-emerges in the F2 generation?
- (v) The given figure depicts the Swachh Bharat Mission. [3]



- (a) When was this campaign launched?
- (b) What is the objective of this programme?
- (c) Mention one notable achievement of this programme.

**Question 7**

- (i) Define Reflex Action. [1]
- (ii) Differentiate between mitosis and meiosis based on the number of daughter cells and chromosome number in the daughter cells produced after division. [2]
- (iii) Mention the two steps of the photochemical phase of photosynthesis. [2]
- (iv) Draw a neat labelled diagram of the structural and functional unit of the nervous system. [2]
- (v) Refer to the diagram and answer the following questions: [3]



- (a) Identify A.
- (b) Why is B called the 'Master gland'?
- (c) Mention the function of C.

**Question 8**

- (i) Define thigmotropism. [1]
- (ii) Differentiate between- Light reaction and Dark reaction based on their site of occurrence and end products [2]
- (iii) State the location of the following: [2]
  - (a) Stomata
  - (b) Lenticels
- (iv) Differentiate between the theory of **use and disuse** and the theory of **natural selection** based on the scientist who proposed these theories. [2]
- (v) The list of structures present in the human ear is given below: [3]

Pinna, Ear ossicles, Semi-circular canals, Auditory canal,  
Eustachian tube, Cochlea

Arrange them in the appropriate column.

Outer Ear	Middle Ear	Inner Ear
_____	_____	_____
_____	_____	_____

\*\*\*

**LILAVATIBAI PODAR HIGH SCHOOL. (ISC)**  
**PRELIMINARY EXAMINATION - II 2025-2026**

Subject: **BIOLOGY [SCIENCE PAPER-3]**

Grade: **X**

Maximum Marks: **80**

Time allowed: **Two Hours**

**Instructions:**

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

**SECTION A (40 Marks)**

(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 answers only.)

(i) The concentration of mineral ions in the root hair sap is often greater than the concentration in the surrounding soil water. Which process must be primarily responsible for this difference?

- a) Imbibition
- b) Passive Transport
- c) Endosmosis
- d) Active Transport

(ii) A woman has normal vision. Her father is colour-blind. She marries a man who is colour-blind. What is the probability that they will have a colour-blind daughter?

- a) 100%
- b) 25%
- c) 50%
- d) 0%

(iii) Hyper secretion of male androgens from the adrenal gland may lead to:

- a) Cushing's syndrome.
- b) Addison's disease
- c) Adrenal virilism.
- d) Cretinism

(iv) Assertion (A): Oestrogen regulates the menstrual cycle.

Reason (R): Oestrogen stimulates the development of the follicle.

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

(v) Which statement best connects the concepts of Population Explosion and Pollution as problems faced by humanity?

- a) The Death Rate falls sharply, leading to crowded cities and air pollution.
  - b) Pollution causes fertility rates to drop, which is a method of population control.
  - c) Population explosion increases the demand for goods and services, resulting in higher industrial production and waste generation, thus accelerating pollution.
  - d) A larger population increases the birth rate, leading to lesser industrial pollution.
- (vi) The maintenance of an unbroken water column throughout the xylem vessels, despite the immense pull of gravity, is critically dependent on which two physical properties of water?

- a) Cohesion and Adhesion
- b) Imbibition and Turgidity.
- c) Root Pressure and Atmospheric Pressure.
- d) Diffusion and Osmosis.

(vii) As per the Potassium Ion Exchange Theory, the final event that leads to the opening of the stomatal pore in the morning is the:

- a) Breakdown of starch into glucose, which increases osmotic pressure.
- b) Influx of water into the guard cells due to the lower water potential caused by the accumulation of ions and organic acids.
- c) Decrease in turgor pressure of the guard cells due to efflux.
- d) Movement of water out of the guard cells following the active transport of ions.

(viii) If the grana of the chloroplast in a plant cell were selectively damaged, which of the following processes would be immediately halted?

- a) Combination of  $\text{CO}_2$  and H to form glucose.
- b) Biosynthetic (Dark) phase.
- c) Photochemical (Light) phase.
- d) Storage of starch granules.

(ix) A farmer is struggling to germinate a batch of old, dormant seeds. Which of the following plant hormones, when applied externally, would be the most effective in stimulating the seeds to overcome dormancy?

- a) Abscisic acid.
- b) Gibberellins.
- c) Auxins.
- d) Ethylene

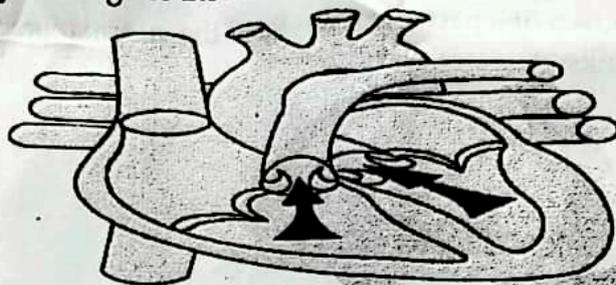
(x) A molecule of a digested drug is absorbed into the bloodstream in the small intestine, which organ must this molecule next pass through, and via which specific blood vessel, before this molecule can enter the general systemic circulation?

- a) Lungs, via the Pulmonary Vein.
- b) Liver, via the Hepatic Portal Vein.
- c) Kidney, via the Renal Artery.
- d) Heart, via the Pulmonary Artery.

(xi) Assertion (A): 'Use and disuse of organs' is based on Darwin's theory.  
Reason (R): Disuse of organs lead to development of vestigial organs.

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

(xii) Identify the stage of the heart seen in the diagram and define it correctly:



- a) Systole- relaxation of the heart muscles
- b) Diastole -relaxation of all the valves of the heart
- c) Systole -contraction of the heart muscles
- d) Diastole – contraction of all the valves of the heart

(xiii) A man is suffering from a medical condition which causes reduced fluid secretion from his seminal vesicles. State the most direct impact on the sperms?

- a) Inability to produce testosterone.
- b) Failure of sperm production in the testes.
- c) Inability to reach the ovum due to the absence of the acrosome enzyme.
- d) A significant decrease in sperm motility due to lack of energy source.

(xiv) During blood coagulation, a key step is the conversion of a soluble plasma protein into an insoluble fibrous protein. Which enzyme is responsible for catalysing this specific, final conversion step?

- a) Thromboplastin, converting Prothrombin to Thrombin.
- b) Fibrinase, converting Fibrin to Fibrinogen.
- c) Thrombin, converting Fibrinogen to Fibrin.
- d) Thrombin, converting Prothrombin to Thrombin.

(xv) Choose the correct option from the statements regarding the human eye.

**P:** The ciliary body muscles regulate the size of the pupil, controlling the amount of light entering the eye.

**Q:** The fovea centralis is the region of brightest vision due to maximum cone cells.

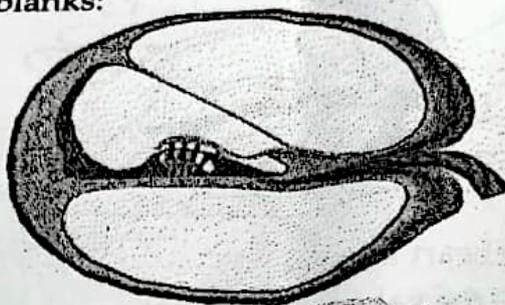
**R:** The choroid is the innermost layer of the eyeball and contains photoreceptor cells

**S:** The aqueous and vitreous humour help in maintaining the shape of the eyeball.

- a) Statements P and R are correct.
- b) Statements Q and S are correct.
- c) Statements P and Q are correct.
- d) Statements R and S are correct.

Question 2

- (i) Give the biological/technical terms for the following: [5]
- (a) The process that causes a hormone secretion to be inhibited or released.
  - (b) The part of the nervous system which consists of cranial nerves.
  - (c) The regular throbbing of arteries caused by blood, which measures the heart rate.
  - (d) The differences in characteristics or traits among individuals of the same species.
  - (e) An example of a non-biodegradable pesticide.
- (ii) Given below is the diagram of a part of the Ear. Read the information below the diagram and fill in the blanks: [5]



The human ear often highlights its role in listening, understanding, and emotional connection. The human ear is made of three parts. The outer, middle and inner ear. The inner ear has three parts. One of them is a spiral shaped structure called (a) \_\_\_\_\_. It is made of three canals separated by membranes. The median canal is filled with a fluid called as (b) \_\_\_\_\_, and the other two canals are filled with a fluid called as (c) \_\_\_\_\_. The middle canal has a membrane called the (d) \_\_\_\_\_ membrane. It contains special sensory cells named as (e) \_\_\_\_\_, associated with the auditory nerve.

(iii) Choose the odd term out from each of the following set of terms. Mention the category to which the remaining three belong: [5]

- a) Myopia, Hyperopia, Presbyopia, Cataract
- b) Medulla Oblongata, Cerebellum Hypothalamus, Pons.
- c) Greenhouse gases, Deforestation, Fossil fuels, Ozone layer depletion.
- d) Adrenal, Pancreas, Thyroid and Pituitary.
- e) Amnion, Placenta, Chorion, Allantois

(iv) "Raul is experiencing changes at puberty, like voice deepening and body hair growth. He learns that hormones from male reproductive system are the cause of this change. Based on this information, answer the following questions. [5]

- a) Name the hormone responsible for this change experienced by Raul.
- b) State the specific function of this hormone.
- c) Name the cells which secrete this hormone.
- d) Name the similar hormone which brings changes at puberty in human females.
- e) Name the cells in the testes that nourish the sperms.

(v) Study the diagram given below and match the structure with its function: [5]  
Given: 1- (a)

Structure	Function
	(a) Receives nourishment from the mother
	(b) allows the foetus to move freely
	(c) cushions the foetus against external jolts
	(d) suspends the foetus within the womb
	(e) exchange of gases, nutrients and waste from mother to foetus
	(f) innermost lining of uterine wall

**SECTION B (40 Marks)**

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

**Question 3**

- (i) Explain the term Menopause. [1]
- (ii) Explain the concept of cohesive and adhesive forces during transpiration. [2]
- (iii) A married couple is expecting their second child. The woman is Rh (-) and the man is Rh (+). Their gynaecologist is concerned about the current pregnancy and has scheduled extra monitoring and treatment. Read the case carefully and answer the questions that follow. [2]
  - a) Name the condition that the doctor is monitoring in the second foetus.
  - b) Explain the concept of Rh factor.
- (iv) Write two points to highlight the role of Tonsils as a lymphatic organ. [2]
- (v) Draw a neat and labelled diagram of the human sperm. [3]

**Question 4**

- (i) Define the term 'Homologous chromosome'. [1]
- (ii) Distinguish between the term gene and allele. [2]
- (iii) Name and define the terms used to calculate the total number of births and deaths. [2]
- (iv) Plant hormones play an important role in plant physiology. Study the picture below and answer the questions: [2]



- (a) Name the hormones that promote cell differentiation and seed dormancy.
- (b) Give an example of a plant that shows Hydrotropism.

(v) State three distinguishing features of Neanderthal man. [3]

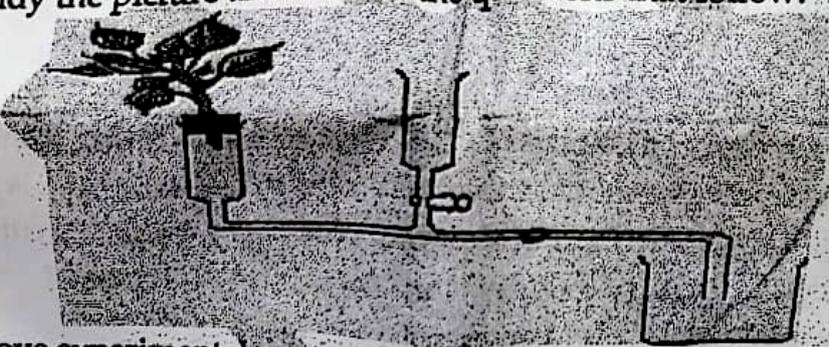
**Question 5**

- (i) Explain Ozone layer depletion. [1]
- (ii) Bharat standard norms are used for vehicles in India. Give two reasons. [2]
- (iii) Arrange the following in a proper sequence: [2]
  - (a) Ejaculatory duct, Seminiferous tubules, epididymis, vas deferens, vasa efferentia.
  - (b) Hepatic vein, Intestine, Vena cava, Liver, Hepatic portal vein
- (iv) Give an example to explain the term 'voluntary' and 'involuntary' actions. [2]
- (v) The plant in the given picture below is able to perform photosynthesis successfully. State any three adaptations in this plant which enables it to do so. [3]



**Question 6**

- (i) State Mendel's law of independent assortment. [1]
- (ii) Study the picture and answer the questions that follow: [2]



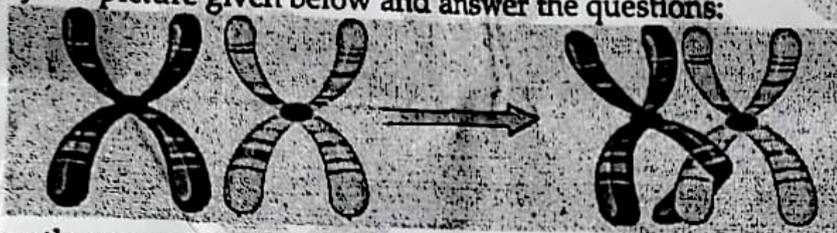
- (a) If the above experimental set up is moved from a dimly lit classroom to an area in bright sunlight, predict and explain the immediate effect on the movement of the air bubble in the capillary tube.
- (b) If the experiment is repeated using a xerophytic plant with fewer stomata, what would happen to the air bubble's movement? Justify your answer with a suitable reason.
- (iii) Expand the following abbreviations: [2]
  - (a) TSH
  - (b) NADPH
- (iv) Explain the role of ear in maintaining balance in our body. [2 points]
- (v) A farmer crosses two heterozygous (Ii) pea plants. [2]
  - (a) What are the possible genotypes of the offsprings? [2]
  - (b) What is the phenotypic ratio of the offsprings? [3]
  - (c) What is the genotypic ratio of the offsprings?

**Question 7**

- (i) State two features of roots which makes them suitable to absorb water. [1]
- (ii) Draw a neat and labelled diagram of the T.S of artery and T.S of vein to show one structural difference. [2]
- (iii) Some pituitary hormones are called as 'Tropic' hormones. Justify this statement with a suitable example of one such relevant hormone. [2]
- (iv) Distinguish between G1 and G2 phase of the cell cycle. [any two differences]. [2]
- (v) A group of trekkers climbing a historical fort on a hot summer day start feeling thirsty. One of the trekkers realised that he had not urinated for a long time. When he finally does, he observes that his urine is very concentrated and dark yellow in colour. Read this passage and answer the following questions. [3]
- (a) Which hormone is primarily responsible for the changes observed in the concentration of his urine, and from where is this hormone released?
- (b) Which part of the nephron does this hormone act upon to conserve water in the body?

**Question 8**

- (i) Name the stages of the menstrual cycle in a sequence. [1]
- (ii) State any two features of Darwin's theory of natural selection. [2]
- (iii) Study the picture given below and answer the questions: [2]



- (a) Define the process in the above picture.
- (b) State one consequence in the event of the failure of this process.
- (iv) Draw a neat and labelled diagram of a plant cell in telophase. [2]
- (v) Look at the picture below and answer the questions that follow: [3]



- (a) Identify the type of pollution depicted in the above picture.
- (b) State one effect of this pollution on human health and other organisms.
- (c) Suggest two primary measures to control this pollution.

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