

# HALF YEARLY EXAMINATION 2024-25

CLASS: X

SUBJECT: BIOLOGY

NAME OF STUDENT:.....

MAX MARKS: 80

DATE:.....

TIME : 2 HOURS

**NOTE:** You will not be allowed to write during the first 15 minutes. This time is to be spent in reading the question paper. The time given at the head of this paper is the time allowed for writing the answers.

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

## SECTION A

Attempt all questions from this Section

### Question 1

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

[15]

(i) The chromatin material is formed of

- (a) DNA only (b) DNA and histones  
(c) Histones only (d) Nucleotides

(ii) The process of DNA replication occurs during which phase of cell cycle?

- (a) G<sub>1</sub> phase (b) S phase  
(c) G<sub>2</sub> phase (d) M phase

(iii) Assertion (A) Water enters the root hair from the soil by the process of osmosis.

Reason (R) The solution in the soil is hypertonic whereas the cell sap in the root hair is hypotonic.

- (a) A is True, R is False (b) A is False, R is True  
(c) Both A and B are True (d) Both A and R are False

(iv) During ventricular systole the semilunar valves (P) \_\_\_\_\_ and the cuspid valves (Q) \_\_\_\_\_.

- (a) P – open, Q – close (b) P – close, Q – close  
(c) P – close, Q – open (d) P – open, Q – open

(v) The biological process that releases oxygen into the air:

- (a) Transpiration (b) Respiration  
(c) Photosynthesis (d) Both Transpiration and Photosynthesis

(vi) Mineral essential for blood clotting;

- (a) Magnesium (b) Calcium  
(c) Zinc (d) Iodine

(vii) Assertion (A) More transpiration occurs from the lower surface of a dorsiventral leaf.

Reason (R) More stomata are present on the lower surface of a dorsiventral leaf.

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

(viii) Priya tried to match the hormones and their functions in plants. She tabulated the pairs as follows:

| Hormones | Functions                 |
|----------|---------------------------|
| P        | Inhibits growth           |
| Q        | Causes ripening of fruits |

Identify the correct pair of hormones.

- (a) P- Auxins, Q- Ethylene (b) P- Gibberellins, Q- Auxins  
(c) P- Cytokinins, Q - Abscisic Acid (d) P- Abscisic acid, Q- Ethylene

(ix) Ozone layer is depleted by:

- (a) Carbon dioxide (b) Sulphur dioxide  
(c) Chlorofluorocarbons (d) Methane

(x) The process by which living or dead plant cells absorb water through surface attraction:

- (a) Active Transport (b) Osmosis  
(c) Imbibition (d) Diffusion

(xi) Assertion (A) Dark phase is the biosynthetic phase of photosynthesis.

Reason (R) Photophosphorylation occurs during dark phase of photosynthesis.

- (a) A is True and R is False (b) A is False and R is True  
(c) Both A and B are True (d) Both A and R are False

(xii) The specific function of light energy in the process of photosynthesis is to:

- (a) Reduce carbon dioxide (b) Synthesize glucose  
(c) Activate chlorophyll (d) Split water molecules

(xiii) Assertion (A) When Rh<sup>+</sup> blood is given to Rh<sup>-</sup> person, antibodies develop in the blood of Rh<sup>-</sup> recipient and in case of second transfusion of Rh<sup>+</sup> blood to such a person clumping of donor's blood cells occurs.

Reason (R) Rh antibodies already developed in the recipient's blood will react with the Rh antigen and cause clumping.

- (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

(xiv) A biology teacher asked her students to give an example of a lymphatic organ:

Raj said: Spleen

Sonu said: Liver

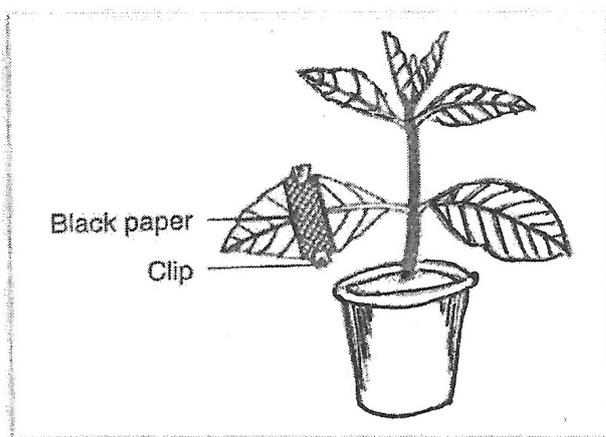
Lata said: Pancreas

Abhay said: Thymus gland

Who is correct?

- (a) Abhay and Sonu (b) Sonu and Lata  
(c) Raj and Lata (d) Abhay and Raj

(xv) An experiment was set up to prove the importance of a factor in photosynthesis. Study the same and name the factor studied in the experiment.



- (a) Oxygen is produced during photosynthesis (b) Carbon dioxide is necessary for oxygen  
(c) Chlorophyll is necessary for photosynthesis (d) Light is necessary for photosynthesis

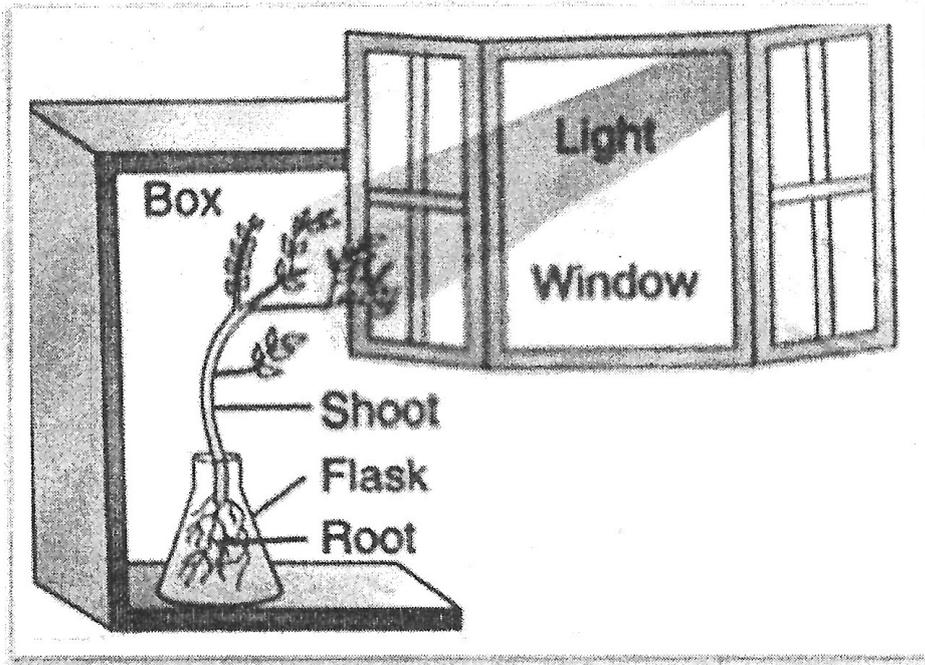
#### Question 2

(i) Name the following:

- (a) A pollutant which is mainly responsible for acid rain.  
(b) The nitrogenous base that pairs with guanine.  
(c) Blood group which is also called 'universal donor'.  
(d) The gas released during photosynthesis.  
(e) The fully distended state of a plant cell due to the absorption of water.

[5]

(ii) Given below is the figure to study growth movement in response to unidirectional light. Read the information below the diagram and fill in the blanks: [5]



Growth dependent plant movements are produced due to differential or unequal growth in different parts of a plant in response to some external stimulus. These are directional movements and maybe in the direction of stimulus or away from it.

The directional growth movement of curvature in response to unidirectional light is called (a) \_\_\_\_\_. The plant hormone responsible for this type of movement of curvature is (b) \_\_\_\_\_. More of the above mentioned hormone moves towards (c) \_\_\_\_\_ side so the cells here divide faster than that of the (d) \_\_\_\_\_ side. Hence, the shoot bends (e) \_\_\_\_\_ the direction of light.

(iii) Arrange and rewrite the terms in each group in the correct order so as to be in a logical sequence beginning with the term that is underlined: [5]

- (a) Telophase, Anaphase, Prophase, Metaphase.
- (b) Endodermis, Root hair, Xylem, Cortex.
- (c) Arteriole, Capillary, Venule, Artery.
- (d) Lungs, Right ventricle, Right auricle, Pulmonary artery.
- (e) Chromatid, Chromosome, DNA, Chromatin fibre

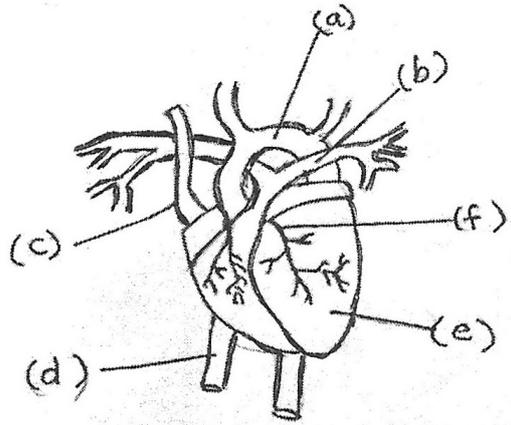
(iv) Read the explanation given below and name the following: [5]

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

Answer: Liver

- (a) Specialized pores present at the ends of veins through which guttation occurs.
- (b) The cell organelle present in the plant cell which is the site of photosynthesis.
- (c) The type of white blood cells that produce antibodies and provide immunity against infection
- (d) The cord like structure that prevents the cuspid valves from being forced into the auricles when ventricles contract.
- (e) A segment of DNA having specific sequence of nucleotides that encodes a particular protein.
- (v) Given below is the diagram of the external feature of the heart. Match the structures marked (a) to (e) with their correct functions. [5]

Example: f-6. Supplies blood to heart muscles

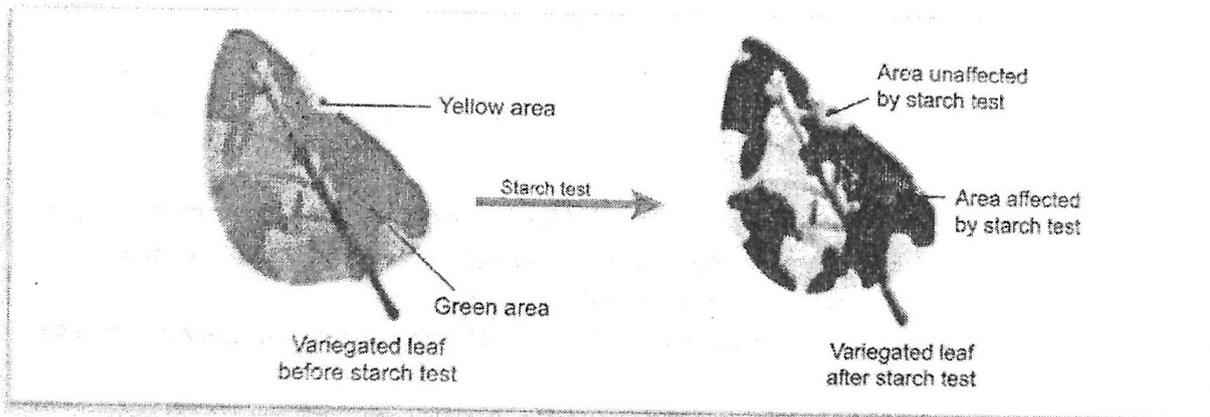
| External structure of the heart   | Functions  |
|---|--|
|  | <ol style="list-style-type: none"> <li>1. Brings deoxygenated blood from upper part of the body to the heart</li> <li>2. Carries deoxygenated blood from heart to lungs.</li> <li>3. Receives oxygenated blood through bicuspid valves.</li> <li>4. Brings deoxygenated blood from lower part of the body to heart</li> <li>5. Carries oxygenated blood to all body parts.</li> <li>6. Supplies blood to heart muscles.</li> </ol> |

**SECTION B**

Attempt any four questions from this section

Question 3

- (i) Define the term 'Photophosphorylation'. [1]
- (ii) Write a balanced chemical equation for photosynthesis. [2]
- (iii) Explain why fresh water fish cannot survive in sea water. [2]
- (iv) Mention any two adaptations in plants that favour the process of photosynthesis. [2]
- (v) Observe the following diagram and answer the questions that follow: [3]



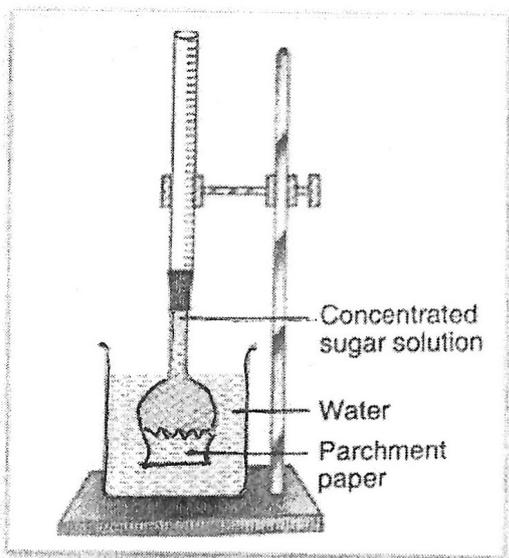
- (a) What is the aim of the experiment?
- (b) How can we remove chlorophyll from the leaf?
- (c) Which chemical is used to check the presence of starch in the leaf?

Question 4

- (i) Why are the walls of left ventricle thicker than the walls of right ventricle? [1]
- (ii) Expand the abbreviation NADP. Explain the role of NADP in photosynthesis. [2]
- (iii) What are biodegradable wastes? Give two examples. [2]
- (iv) Mention two points of difference between mitosis and meiosis with regards to: [2]
  - (a) The number of daughter cells formed.
  - (b) The chromosome number in the daughter cells
- (v) Draw a neat and labelled diagram of a chloroplast. [3]

### Question 5

- (i) Mention one advantage of osmosis to plants. [1]
- (ii) What is 'Thigmotropism'. Give one example. [2]
- (iii) Give two structural differences between RBCs and WBCs. [2]
- (iv) Write two important functions of auxins. [2]
- (v) Study the figure given below and answer the following questions. [3]



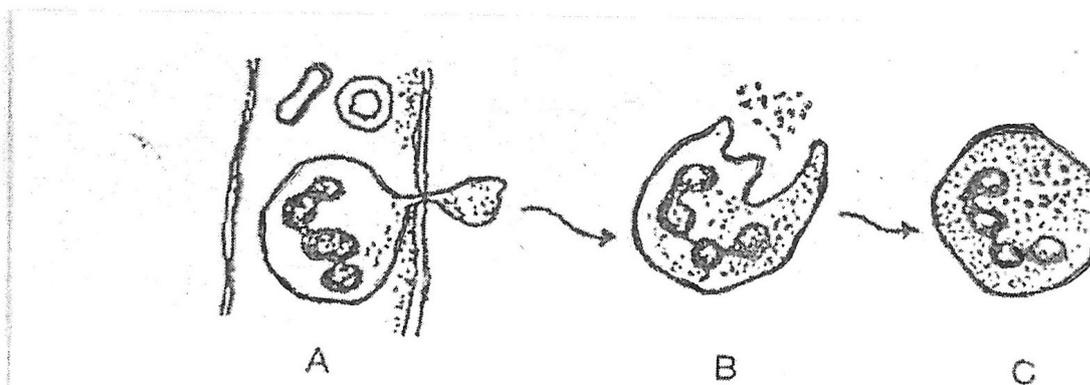
- (a) Define the process.
- (b) What would you observe in the experimental setup after an hour?
- (c) Name any other substance that can be used instead of parchment paper in this experiment.

### Question 6

- (i) Define 'Transpiration'. [1]
- (ii) What is biomedical waste? Give one example. [2]
- (iii) Differentiate between turgor pressure and wall pressure. [2]
- (iv) Mention two ways by which photosynthesis is important for life. [2]
- (v) Draw a neat and labelled diagram of the experimental set-up to show that green plants give out oxygen during photosynthesis. [3]

### Question 7

- (i) What is 'Systemic circulation'? [1]
- (ii) Mention the type of cell division which takes place for: [2]
  - (a) Growth of shoot
  - (b) Formation of pollen grains
- (iii) Write down two harmful effects of noise pollution. [2]
- (iv) Which parts of the plant exhibit: [2]
  - (a) Positive Geotropism
  - (b) Negative hydrotropism
- (v) Study the diagram carefully and answer the questions that follow: [3]



- (a) Identify the phenomenon occurring in figure A  
(b) Name the process occurring in figure B and C  
(c) What is the importance of the above process occurring in (b) in the human body?

**Question 8**

- (i) What is a chromosome? [1]  
(ii) Given below are two statements which are incorrect rewrite the correct statements. [2]  
(a) Large intercellular spaces in the palisade parenchyma of leaf help in easy diffusion of carbon dioxide to every cell.  
(b) The root hair become turgid when too much chemical fertilizers are added around it.  
(iii) During mitosis, what happens to the nuclear membrane in: [2]  
(a) Prophase  
(b) Telophase  
(iv) The teacher was explaining the mechanism of stomatal transpiration. [2]  
(a) Trace the path of water using the following terms:  
Stoma, xylem, spongy parenchyma, substomatal space, intercellular space  
(b) Name the type of transpiration that takes place through the pores present on the stem of old dicot plants.  
(v) Draw a neat and labelled diagram of a plant cell having four chromosomes as it would appear in the metaphase stage of mitosis. [3]

END