

HALF-YEARLY EXAMINATION 2023-24

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

Select the correct answers to the questions from the given options. (Do not copy the question. Write the correct answers only.)

[15]

(i) The stage of mitosis during which nuclear membrane and nucleolus reappear:

- (a) Metaphase
- (b) Prophase
- (c) Telophase
- (d) Anaphase

(ii) The structural units of DNA are:

- (a) Nucleosomes
- (b) Nucleoplasm
- (c) Nucleotides
- (d) Histones

(iii) Exchange of CO₂ and oxygen between leaves and the outside air takes place by:

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





(iv) Colour of dry cobalt chloride paper is:

- (a) Blue
- (b) Pink
- (c) Black
- (d) White

(v) The point where two sister chromatids of a chromosome are attached:

- (a) Chromomere
- (b) Chiasmata
- (c) Centrosome
- (d) Centromere

(vi) What will happen if a plant cell is placed in a concentrated sugar solution?

- (a) Endosmosis
- (b) Exosmosis
- (c) Deplasmolysis
- (d) Active transport

(vii) The dark phase of photosynthesis is also called:

- (a) Photochemical phase
- (b) Biosynthetic phase
- (c) Hill Reaction
- (d) Light dependent phase

(viii) Hari kept a ripe fruit in a basket to hasten the ripening of other raw fruits. This effect was due to the release of:

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

(ix) Assertion (A): The right ventricle has thicker walls than the left ventricle.

Reason (R): The left ventricle pumps blood to the farthest point of the body such as toes in the feet or upto the brain against gravity.

- (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) The vitamin essential for clotting of blood is:

- (a) Vitamin A
- (b) Vitamin B
- (c) Vitamin K
- (d) Vitamin C

(xi) The optimum temperature at which photosynthesis is maximum is:

- (a) 25°C
- (b) 35°C
- (c) 35-40°C
- (d) 45°C

(xii) The growth of pollen tube towards ovules is an example of:

- (a) Hydrotropism
- (b) Geotropism
- (c) Chemotropism
- (d) Phototropism

(xiii) The rise in earth's temperature due to greenhouse effect is called global warming. Which of the following are the major consequences of global warming?

- P. Climatic changes
- Q. Rise in sea level
- R. Acid rain

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

(xiv) The source of oxygen produced during photosynthesis is:

- (a) Water
- (b) Glucose

- (c) Carbon dioxide
- (d) both (a) and (b)

(xv) Lata observed droplets of water along the margins of the leaves of a tomato plant growing in wet soil, in the morning. Which of the following is/are involved in the process above?

- (a) Hydathodes
- (b) Lenticels
- (c) Cuticle
- (d) Stomata

Question 2

(i) Name the following: [5]

- (a) Highly coiled and condensed chromatin fibres.
- (b) The nitrogenous base of DNA that pairs with cytosine with three hydrogen bonds.
- (c) The anticoagulant present in the blood that prevents blood clotting inside blood vessels.
- (d) The biological process that releases oxygen into the air.
- (e) The process by which molecules distribute themselves evenly within the space they occupy.

(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) G₁ Phase, S phase, G₂ Phase, M Phase.
- (b) Endodermis, Cortex, Xylem, Root hair.
- (c) Metaphase, Prophase, Anaphase, Telophase.
- (d) Pulmonary artery, Right auricle, Vena cava, Right ventricle.
- (e) Arteriole, Venule, Capillary, Vein.

(iii) Fill in the blanks with suitable words: [5]

To test the leaf for starch, the leaf is boiled in water to _____ (i). It is next boiled in methylated spirit to _____ (ii). The leaf is placed in warm water to soften it. It is then placed in a dish and _____ (iii) solution is added. The region, which contains starch, turns _____ (iv) and the region, which does not contain starch turns _____ (v).

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

- (a) Auxin, Guanine, Cytosine, Thymine.
- (b) Oil spills, Sewage, X-Rays, Detergents.



(c) Erythrocytes, Basophils, Neutrophils, Monocytes

(d) Prophase, Telophase, Metaphase, Interphase.

(e) Cytokinins, Gibberellins, Auxins, Cytosine.

(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
(a) Cobalt chloride paper	1 Absorbs O ₂
(b) Iodine solution	2 Indicator for moisture
(c) Potassium hydroxide	3 Absorbs CO ₂
(d) Abscisic Acid	4 Growth inhibitor
(e) Biosynthetic phase	5 Starch test
	6 Growth promoter
	7 CO ₂ fixation

SECTION B

Attempt any four questions from this section

Question 3

- (i) Name the complex structure consisting of DNA strand and a core of histones. [1]
- (ii) What is Photophosphorylation? [2]
- (iii) What is the significance of Hepatic Portal Vein in man? [2]
- (iv) Mention two measures to minimize noise pollution. [2]
- (v) Draw a neat and labelled diagram of the nucleus of an animal cell having chromosome number 4, as it would appear in the metaphase stage of mitosis. [3]

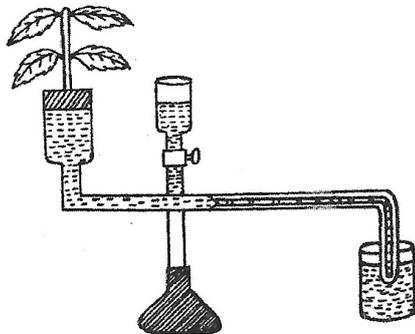
Question 4

- (i) Where are genes located? [1]
- (ii) Differentiate between mitosis and meiosis on the basis of chromosome number in the daughter cells. [2]
- (iii) Freshwater fish cannot survive in sea water. Why? [2]
- (iv) Name two plant hormones that induce parthenocarpy. [2]
- ✕ (v) Draw a neat and labelled diagram of the internal structure of a chloroplast. [3]

Question 5

- (i) Define 'active transport'. [1]

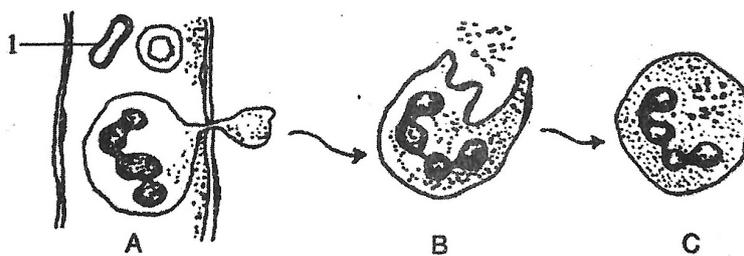
- (ii) Differentiate between turgor pressure and wall pressure. [2]
- (iii) More transpiration occurs from the lower surface of a dorsiventral leaf. Explain why? [2]
- (iv) When are sounds 'Lubb' and 'Dup' produced during a heartbeat? [2]
- (v) The given diagram of an apparatus demonstrates a particular process in plants. Study the same and answer the questions that follow: [3]



- (a) Name the apparatus?
- (b) Which phenomenon is demonstrated by this apparatus?
- (c) State one limitation of using this apparatus.

Question 6

- (i) Where are auxins produced? [1]
- (ii) Give two differences between guttation and bleeding. [2]
- (iii) What happens during photolysis of water? [2]
- (iv) Name two sources of air pollution. [2]
- (v) Study the following diagram carefully and then answer the questions that follow: [3]



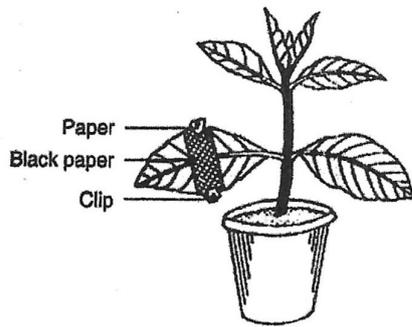
- (a) Name the cell labelled 1.
- (b) Identify the phenomenon occurring in A.
- (c) Name the process occurring in B and C.

Question 7

- (i) What is root pressure? [1]
- (ii) What do you mean by 'double circulation' of blood in mammals? [2]
- (iii) Roots grow downwards and shoots grow upwards. Why? [2]

(iv) Give two differences between arteries and veins. [2]

(v) A potted plant with variegated leaves was taken in order to prove a factor necessary for photosynthesis. The potted plant was kept in the dark for 24 hours and then placed in bright sunlight for a few hours. Observe the diagram and answer the questions. [3]

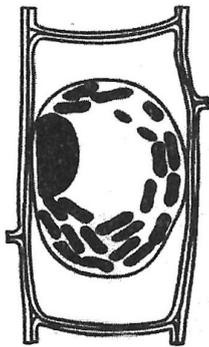


- What aspect of photosynthesis is being tested in the above diagram?
- Represent the process of photosynthesis in the form of a balanced equation.
- What will you observe in the experimental leaf after the starch test?

Question 8

- What is mitosis? [1]
- Name two cell organelles not found in the red blood corpuscles. [2]
- Mention two ways in which photosynthesis is beneficial to man. [2]
- Explain how the rate of transpiration is affected by- [2]
 - Intensity of light
 - Humidity of the atmosphere
- The diagram given below represents a plant cell after being placed in a strong sugar solution.

Study the same and answer the questions that follow: [3]



- What is the state of the cell shown in the diagram.
- How can the above cell be brought back to its original condition?
- Mention the scientific term for the recovery of the cell.

END