



ST. JOSEPH'S COLLEGE, PRAYAGRAJ

HALF YEARLY EXAM – OCTOBER 2023

BIOLOGY

CLASS X

Time: 2 Hrs.

M.M.: 80

Note: You will be not allowed to write in 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 the brackets [].

SECTION A

[40]

[Attempt all the questions from this Section]

Q1. Select the most appropriate answer from the given options. Do not copy the questions. Write the answers only. [15]

- i. A plant cell regains turgidity when placed in a hypotonic solution, phenomenon is termed as;
a. Returgidity b. Plasmolysis c. Replasmolysis d. Deplasmolysis
- ii. Complimentary base pair of Cytosine will be;
a. Adenine b. Guanine c. Thymine d. Adenosine
- iii. A student in order to remove chlorophyll from the leaf, should;
a. Strongly heat the leaf over the flame b. Boil the leaf in water c. Treat the leaf in iodine solution
d. Boil the leaf in methylated spirit
- iv. The fluid present between the membranes of the heart is;
a. Synovial fluid b. Pericardial fluid c. Pleural fluid d. Cerebrospinal fluid
- v. Collection of latex that oozes out from the cut made in the stem of the plant is due to;
a. Guttation b. Transpiration c. Diffusion d. Bleeding;
- vi. The plant hormone that inhibits apical dominance is;
a. Auxin b. Gibberellin c. Cytokinin d. Abscisic acid
- vii. Valves are present in the veins;
a. To keep up the flow of blood b. To direct the blood in all the directions
c. To prevent backward flow of blood d. To prevent further flow of blood
- viii. Combination of haemoglobin and carbon-dioxide is called;
a. Carbaminohaemoglobin b. Carboxyhaemoglobin
c. Oxyhaemoglobin d. Carbon monoxide
- ix. Diapedesis is a phenomenon when;
a. the red blood cells enter the blood capillaries
b. the white blood cells squeeze out of the walls of the blood capillaries
c. the platelets release blood clotting factors
d. the white blood cells engulfs bacteria
- x. Light independent phase occurs;
a. in the stoma of the chloroplast b. in the dark
c. in the stroma of the chloroplast d. in the membrane of thylakoid
- xi. Thick cuticle present on the leaf is a way to;
a. Increase the rate of photosynthesis b. increase rate of transpiration
c. decrease the rate of photosynthesis d. decrease the rate of transpiration
- xii. Plant hormone that is gaseous in nature;
a. Auxin b. Gibberellin c. Cytokinin d. Ethylene
- xiii. The F_2 ratio of 9:3:3:1 is due to;
a. Law of dominance b. Law of segregation
c. Law of purity of gametes d. Law of independent assortment
- xiv. Variegated leaf is used to prove the importance of which factor in photosynthesis?
a. Carbon-dioxide b. Water c. Chlorophyll d. Light
- xv. The growth movements of plants in response to touch is termed as;
a. Geotropism b. Phototropism c. Chemotropism d. Thigmotropism



Q2.

i.

Name the following:

- DNA threads looping over histone proteins.
- Point of intersection when one chromatid crosses over the other non-sister chromatid.
- Type of osmosis when water molecules enter a cell.
- ~~Bony part of the skull that holds the human brain.~~ A large lymphatic organ
- Specific sequences of nucleotides.

[5]

ii. Arrange and rewrite in a logical sequence:

- Anaphase, prophase, telophase, metaphase.
- Fibrin, thrombokinase, fibrinogen, platelets.
- Photolysis, sunlight, glucose formation, chlorophyll activation.
- Endodermis, soil water, cortical cells, epidermis.
- Hepatic vein, intestinal region, liver, hepatic portal vein.

[5]

iii. Fill in the blanks with suitable words:

Most of the transpiration takes place through the structures (a) _____. These have (b) _____ cells that can regulate its opening and closing. These are located in the lower (c) _____ of a dicot leaf. Transpiration results in creating (d) _____ which can take the sap in the tallest of the trees. If transpiration exceeds the rate of absorption, then (e) _____ occurs in the plant.

[5]

iv. Choose the odd one out and write the category to which the rest belongs to:

- Eosinophils, neutrophils, monocytes, basophils.
- Chromosome, nucleolus, centrosome, gene.
- Pulmonary artery, Inferior vena cava, pulmonary vein, superior vena cava.
- Imbibition, osmosis, active transport, diffusion.
- Lenticels, hydathodes, stomata, cuticle.

[5]

v. Match column I with that of column II. Rewrite the correct matched pairs:

Column I	Column II
a) Pacemaker	1) forms gametes.
b) Papillary muscles	2) results in variation among the children of same parents.
c) Crossing over	3) law of inheritance.
d) Meiosis	4) located in the arteries.
e) Mitosis	5) generates heartbeat.
	6) helps in repair and growth of the body.
	7) holds chordae tendinae.

[5]

SECTION B

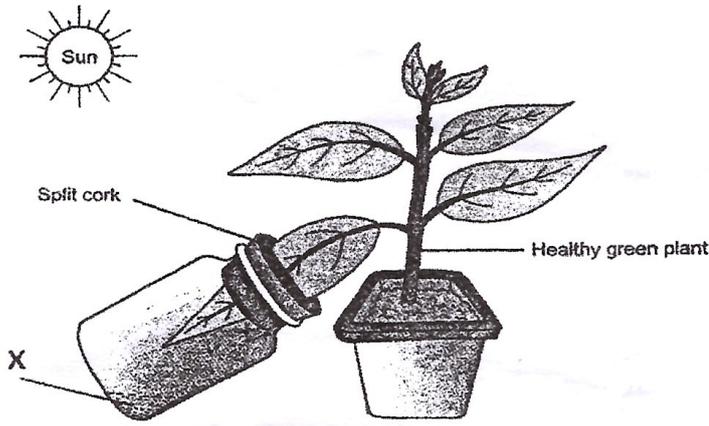
[40]

[Attempt any four questions with correct question numbers as assigned]

Q3.

- Define photosynthesis. [1]
- How does higher light intensity and a higher CO₂ concentration affects the rate of photosynthesis? [2]
- Expand the abbreviation NADP and state its role. [2]
- Which region of the visible spectrum of light results in maximum photosynthesis? [2]

- v. Given below is an experimental set up to prove the significance of a factor in the process of photosynthesis. Observe the same carefully and answer the following questions. [3]



- a) Name the factor being studied in the above set up.
 b) Name the chemical marked as X.
 c) State your observation that would help to prove the aim of the experiment.

Q4.

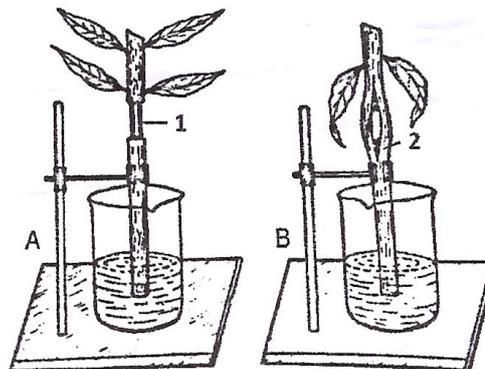
- i. Define the term blood pressure. [1]
- ii. Write two functions of the blood. [2]
- iii. Explain lymph. State its two functions. [2]
- iv. Why one should not sleep with a burning furnace in a poorly ventilated room during winters? [2]
- v. Draw a labelled diagram of an artery and a vein. [3]

Q5.

- i. Define the term allele. [1]
- ii. Differentiate between the terms homozygous and heterozygous. [2]
- iii. Write the phenotypic and genotypic ratio of F_2 generation of a monohybrid cross. [2]
- iv. What is X-linked inheritance? [2]
- v. Predict the genotype and phenotype of the children born to the parents, where the mother is a carrier while the father suffers from colour blindness. [3]

Q6.

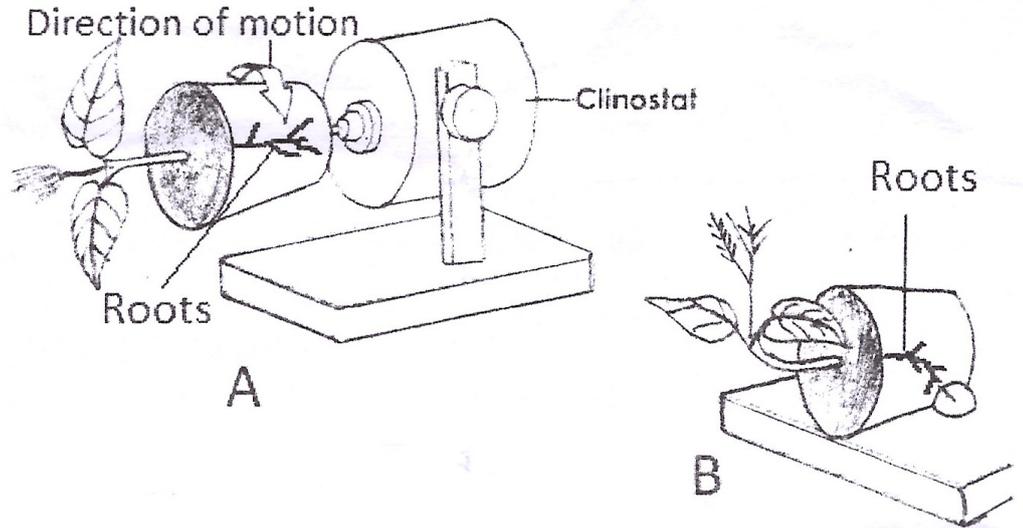
- i. What is Photolysis? [1]
- ii. Excess of salt in the pickles acts as a preservative. Explain. [2]
- iii. Explain two important features of root hair that helps in the process of absorption. [2]
- iv. Explain Destarching in plants. [2]
- v. Given below are two healthy potted plant. In set up A, a ring of bark is removed while in set up B only the central part of the stem is removed. Study the picture and answer the questions. [3]



- a) Label the parts marked as 1 and 2.
- b) State the aim of the set-up A and B
- c) Why are the leaves not in the upright position in set-up B?

Q7.

- i. What is parthenocarpy? [1]
- ii. Expand IAA and give its most important function. [2]
- iii. Name the plant hormone regarded as Stress Hormone. Give reason for giving this name. [2]
- iv. Explain with reason the bending of the shoots of the plant towards the source of light? [2]
- v. Given below are two set-ups A and B. Set-up A is in motion rotating the pot and its plant while set-up B is kept stationary. Study the picture and answer the questions that follow. [3]



- a. State the aim of the experiment.
- b. Give logical reasons for the changes you observe in both the set-ups.
- c. State the Law of dominance.

Q8.

- i. What is a cardiac cycle? [1]
- ii. Expand the abbreviated terms SAN and AVN. [2]
- iii. Differentiate between turgor pressure and wall pressure. [2]
- iv. When are the two heart sounds, LUB and DUP produced? [2]
- v. Explain the terms: [3]
 - a. Genetic recombination.
 - b. Photophosphorylation.
 - c. Root Pressure.

*****ALL THE BEST*****