



ST. JOSEPH'S COLLEGE, PRAYAGRAJ

HALF-YEARLY EXAMINATION 2025-26

BIOLOGY

CLASS – X

TIME: 2 Hours

MM: 80

Answer 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 questions from Section A and all four questions from Section B

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

SECTION – A [40 Marks]

Q 1) Choose the correct answers to the questions from the given options:

(Do not copy the questions, write the correct option and answer only)

- (i) KOH in physiological experiments is used to absorb : [1]
(a) Oxygen (b) Water vapour
(c) light (d) CO₂
- (ii) Assertion (A) : Photolysis occurs in grana of a chloroplast. [1]
Reason (R) : Piles of thylakoids are called granum.
(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
- (iii) NADP is expanded as : [1]
(a) Nicotinamide adenosine dinucleotide phosphate
(b) Nicotinamide adenine dinucleotide phosphate
(c) Nicotinamide adenine dinucleous phosphate
(d) Nicotinamide adenosine dinucleous phosphate.
- (iv) The given diagram is that of a Neutrophil. The function is _____ [1]
(a) secreting hormone (b) transporting food
(c) phagocytosis (d) producing antibodies
- (v) Addition of salt to pickles is a method of killing bacteria by: [1]
(a) Flaccidity (b) Deplasmolysis
(c) Turgidity (d) Plasmolysis
- (vi) Assertion (A) : Both centromeres and centrioles are part of a chromosome. [1]
Reason (R) : the centromere is the region where spindle fibres attach, while the centriole helps in the formation of spindle fibres.
(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
- (vii) Raghav potted some germinated seeds in a pot. He put the pot in a cardboard box that was open from one side. He kept the box in a way that the open side of the box was facing sunlight near his window. After few days he observes that the shoot bends towards the light. Which type of tropism does he observe? [1]
(a) Geotropism (b) Phototropism
(c) Chemotropism (d) Hydrotropism
- (viii) Assertion (A) : The sex of a child is determined by the mother. [1]
Reason (R) : The chromosome number of humans is 46.
(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
- (ix) A doctor has advised Sameer to reduce sugar intake in his diet and do regular exercise after checking his blood test reports. Which disease do you think Sameer is suffering from? [1]
(a) Diabetes mellitus (b) Acromegaly
(c) Diabetes insipidus (d) Cretinism

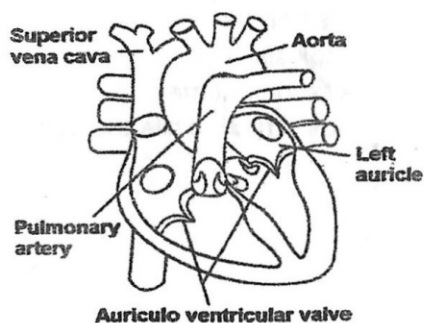
- (x) Chromosomes get aligned at the center of the cell during : [1]
 (a) Metaphase (b) Prophase
 (c) Telophase (d) Anaphase
- (xi) The 9:3:3:1 dihybrid ratio is due to : [1]
 (a) Segregation (b) Crossing over
 (c) Homologous pairing (d) Independent assortment
- (xii) The dominant hereditary trait in human is: [1]
 (a) Blue coloured eyes (b) Left handedness
 (c) Ability to roll tongue (d) Attached ear lobe
- (xiii) Assertion (A) : RNA and proteins are synthesised and volume of cytoplasm increase in G₁ phase of cells cycle. [1]
 Reason (R) : DNA synthesis occurs in G₂ phase of cell cycle.
 (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.
- (xiv) What does the square indicate in the following pair ? [1]



- (a) Male with trait (b) Female without trait
 (c) Male without trait (d) Female with trait
- (xv) Vitamin K, a fat soluble vitamin, is essential for the production of : [1]
 (a) Prothrombin (b) Fibrinogen
 (c) Thrombin (d) Fibrin

- Q 2) (i)** Given below is the internal structure of the human heart. Match the structures labelled with their correct functions : [5]

Internal structure of Human heart



1. Brings deoxygenated blood from upper regions of the body.
2. Receives oxygenated blood from lungs.
3. Does not allow mixing the oxygenated and deoxygenated blood inside the heart.
4. Produces first sound LUBB
5. Carries deoxygenated blood to lungs for oxygenation.
6. Supplies oxygenated blood to all body parts.

- (ii) Correct the statements given below by changing the underlined words. [5]
 (i) Abcisc acid is a plant hormone that delays senescence
 (ii) Movement of pollen tube towards the female gametophyte is an example of Thigmotropism.
 (iii) Chemotropism is the response where young flower heads follow the sun across the sky.
 (iv) The gaseous plant hormone is Auxin.
 (v) Fruits produced without fertilization are called false fruits.

- (iii) Complete the following by filling in the blanks 1 to 5 with appropriate words: [5]
 To test the leaf for starch, the leaf is boiled in water to (1). It is next boiled in methylated spirit to (2). The leaf is placed in warm water to soften it. It is then placed in a dish and (3) solution is added. The region, which contains starch, turns (4) and the region, which does not contain starch, turns (5).

- (iv) Explain briefly : [5]
 (i) Xerophytes have their leaves modified to spines or reduced in size.
 (ii) A higher rate of transpiration is recorded on a windy day rather than on a calm day.
 (iii) During the day transpiration and photosynthesis are interlinked.
 (iv) Renal cortex has a dotted appearance and Renal medulla has a striped appearance.
 (v) RBC are called deficient but efficient.

(v) Fill in the blanks:

- The life span of a RBC is _____.
- In humans, urea is formed in _____.
- Human red blood cells, when keep in a hypertonic solution _____ occurs.
- Exudation of sap or watery solution from the cut or injured parts of a plant is called _____.
- _____ is the loss of cell sap or water solution through the hydathodes without any injury.

[5]

SECTION – B [40 Marks]

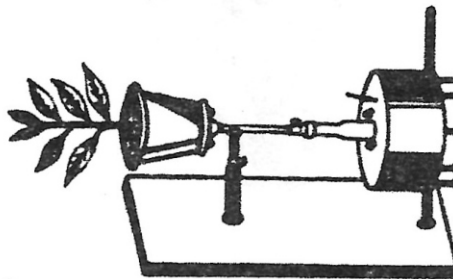
Q 3)

(i) What is Osmosis ?

[1]

(ii) Identify the figure given below and then answer the questions that follows -

[2]

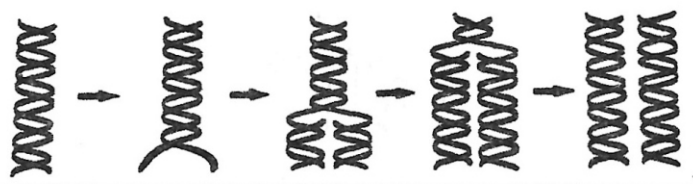


(a) Name the instrument shown in the figure.

(b) Why is the instrument made to rotate?

(iii) Diagram given below shows a process of formation of new DNA from the parent DNA strand.

[2]



(a) What is this process technically called as?

(b) During which phase of the Interphase the above process occur?

(iv) A candidate in order to study the importance of certain factors in photosynthesis, took a potted plant and kept in the dark for over 24 hours. Then in the early hours of the morning she covered one of the leaves with black paper in the centre only. She placed the potted plant in the sunlight for a few hours and then tested the leaf which was covered with black paper for starch.

[2]

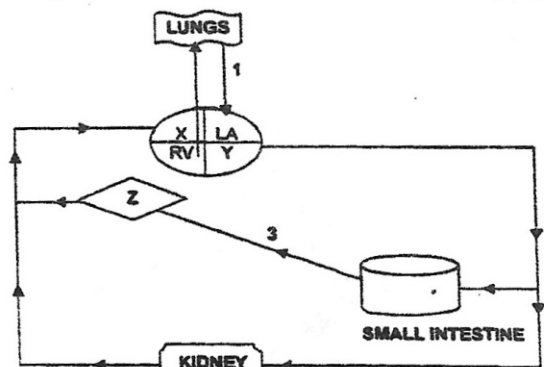


(i) What aspect of photosynthesis was being investigated?

(ii) Why was the plant kept in the dark before the experiment?

(v) Given below is a schematic diagram of the human blood circulatory system. Answer the questions that follows -

[3]



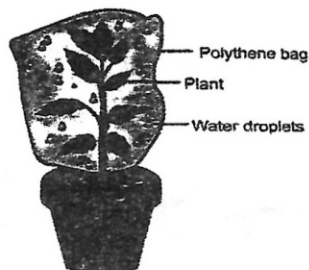
(a) Name the blood vessels numbered 1, 2 and 3

[3]

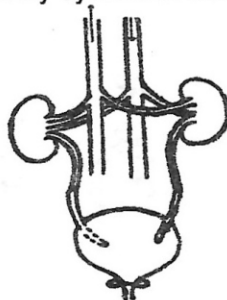
- (b) What is the name of organ Z?
(c) Differentiate between X and Y on the basis of:
1. Blood flowing through them.
2. Structure

Q 4)

- (i) What do understand by the term DIAPYCNESIS. [1]
(ii) Meena covered a potted plant as shown below with a transparent plastic bag. She observed water droplets inside the bag after a few hours when kept in sunlight. [2]



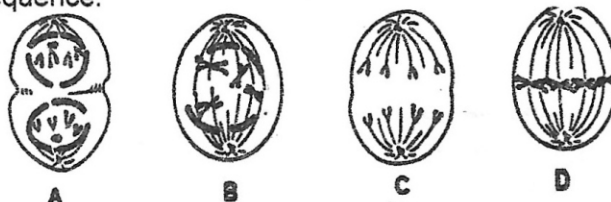
- (a) Name the process that resulted in the formation of water droplets inside the bag.
(b) Define the process mentioned above.
(iii) Draw a neat, labelled diagram to show the internal structure of a root hair. [2]
(iv) Write a short note on the cardiac cycle. [2]
(v) The diagram given below shows the excretory system of human being. [3]



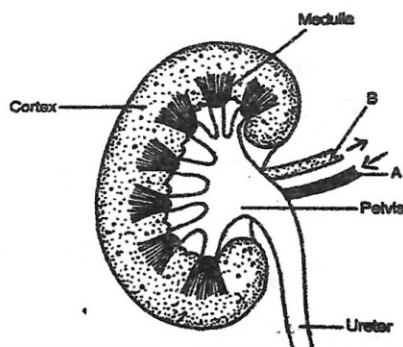
- (a) Why are the kidneys asymmetrical in position?
(b) Why is excretion necessary in humans?
(c) What is the role of sphincter muscles present in the opening of the urinary bladder.

Q 5)

- (i) State Mendel's second law of inheritance. [1]
(ii) Shown below are four stages (A,B,C,D) (not in sequence) of a certain kind of cell division. Identify each of them and arrange in proper sequence. [2]



- (iii) Draw a well labelled diagram of a chloroplast. [2]
(iv) Write two differences in the composition of the blood flowing through blood vessels A and B. [2]



[4]