ICSE Board
Class X Biology
Board Paper
Semester 1 - 2021

Time: 1 hr **Total Marks: 40**

Maximum Marks: 40
Time Allowed: One Hour
You will not be allowed to write during the first 10 minutes.
This time is to be spent in reading the question paper.

ALL QUESTIONS ARE COMPULSORY
The marks intended for the questions are given in brackets [ ]

Select the correct option for each of the following questions.

Question 1
Name the following by choosing the correct option:

(i) The process of conversion of ADP to ATP during photosynthesis:
- (a) Polymerisation
- (b) Photophosphorylation
- (c) Photorespiration
- (d) Photolysis

(ii) Permanently open structures seen on the barks of old woody stems:
- (a) Stomata
- (b) Hydathodes
- (c) Lenticels
- (d) Epidermal pores

(iii) The pressure developed in the roots due to continuous inward movement of water by cell to cell osmosis:
- (a) Root Pressure
- (b) Wall Pressure
- (c) Turgor Pressure
- (d) Air Pressure

(iv) The type of gene, which in presence of a contrasting allele is not expressed:
- (a) Homozygous
- (b) Heterozygous
- (c) Dominant
- (d) Recessive

(v) After mitosis, a female human cell will have:
   (a) 44+XX chromosomes
   (b) 22+X chromosomes
   (c) 22+Y chromosomes
   (d) 44+XY chromosomes

Question 2

Complete the following statements by choosing the appropriate option for each blank:

(i) At the end of _____, cytokinesis is completed.
   (a) Metaphase
   (b) Prophase
   (c) Interphase
   (d) Telophase

(ii) The genotype of a person who cannot roll his tongue is _____.
   (a) Rr
   (b) RR
   (c) rr
   (d) RRr

(iii) When a cell is placed in a _____ solution it becomes plasmolysed.
   (a) Distilled water
   (b) Hypertonic
   (c) Isotonic
   (d) Hypotonic

(iv) The nitrogenous base Adenine always pairs with _____
   (a) Thymine
   (b) Guanine
   (c) Cytosine
   (d) Thiamine

(v) The basic units of heredity are _____
   (a) Chromosomes
   (b) Chromatids
   (c) Genes
   (d) Centrosome

Question 3

Choose the correct answer from each of the four options given below:

(i) NADP is expanded as:

(a) Nicotinamide Adenosine Dinucleotide Phosphate
(b) Nicotinamide Adenine Dinucleotide Phosphate
(c) Nicotinamide Adenine Dinucleolus Phosphate
(d) Nicotinamide Adenosine Dinucleolus Phosphate

(ii) Transpiration is useful to the plant because it:

(a) Creates a suction force for absorption of water from the soil
(b) Helps in photophosphorylation
(c) Synthesises glucose
(d) Splits water molecules

(iii) A homozygous pea plant having purple flowers is crossed with a homozygous pea plant bearing white flowers. The phenotypic ratio of the offspring obtained in F_2 generation is:

(a) 2:1
(b) 1:1
(c) 1:2:1
(d) 3:1

(iv) The shoot from a balsam plant is kept in a beaker containing eosin solution (pink). The pink colour will be distinctly seen in the:

(a) Xylem
(b) Phloem
(c) Epidermis
(d) Cortex

(v) Replication of DNA in the cell cycle occurs during the:

(a) G_1 – Phase
(b) Anaphase
(c) S – Phase
(d) G_2 – Phase

Question 4

Explain the following terms:

(i) Karyokinesis

(a) It is the division of nucleus during cell division
(b) It is the division of cytoplasm during cell division
(c) It is the division of centrosome
(d) It is the division of nucleolus

(ii) Law of Dominance

(a) Out of a pair of contrasting alleles present together, only the recessive allele is able to express itself while the dominant remains suppressed

(b) Out of a pair of contrasting alleles present together, only the dominant allele is able to express itself while the recessive remains suppressed

(c) Out of a pair of contrasting alleles present together, both dominant and recessive cannot express themselves

(d) Out of a pair of contrasting alleles present together, both dominant and recessive can express themselves

(iii) Mutation:

(a) It is a sudden change in one or more genes in an organism's cells which is heritable

(b) It is a change in the number of centrosomes in an organism's cell which is heritable

(c) It is a change in the structure of cell membrane in an organism's cells which is heritable

(d) It is a change in the shape of cells which is heritable

(iv) Photosynthesis

(a) It is the synthesis of glucose from carbon dioxide by non-green plants using light energy.

(b) It is the synthesis of glucose by green plants from carbon dioxide using light energy.

(c) It is the synthesis of glucose from carbon dioxide and water by non-green plants using light energy.

(d) It is the synthesis of glucose from carbon dioxide and water by green plants using light energy.

(v) Transpiration:

(a) It is the loss of water in the form of droplets from the aerial parts of the plant.

(b) It is the loss of water in the form of water vapour from the underground parts of the plant.

(c) It is the loss of water in the form of water vapour from the aerial parts of the plant.

(d) It is the loss of water in the form of water vapour from all parts of the plant.

Question 5

Mention the exact location of the following:

(i) Aster

(a) Around the centrioles in plant cells

(b) Around the centrioles in animal cells

(c) Around the chromatids in animal cells

(d) Around the chromatids in plant cells

(ii) Guard cells
(a) Around the root hairs
(b) Around the lenticels
(c) Around the thylakoids
(d) Around the stoma

(iii) Xylem tissue:
(a) Conducts water and minerals in leaves
(b) Does not conduct water and minerals in stems
(c) Conducts food and nutrition to roots
(d) Conducts food and nutrients to all parts of the plant

(iv) Centrioles
(a) Found only in plant cells
(b) Found inside nucleus
(c) Found only in animal cells
(d) Found in animal and plant cells

(v) Genes
(a) Present on cell walls
(b) Present on chloroplast
(c) Present on chromosomes
(d) Present on centrosomes

Question 6
State the function of the following:
(i) Cell wall
(a) Regulates entry of solutes in plant cells
(b) Regulates entry of solutes in animal cells
(c) Gives rigidity and shape to plant cells
(d) Gives rigidity and shape to animal cells

(ii) Centromere:
(a) It is the point of attachment of two sister chromatids
(b) It is the point of attachment of two centrioles
(c) It is the point of attachment of two centrosomes
(d) It is the point of attachment between two daughter nuclei

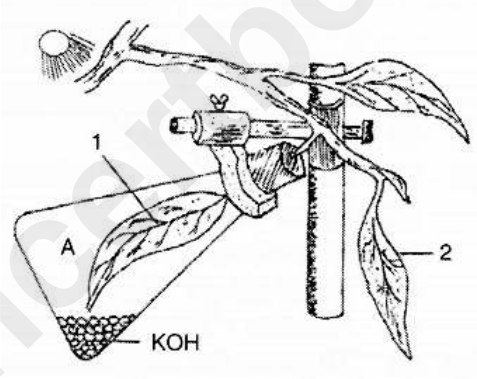
(iii) Cuticle on leaves:
(a) Prevents photosynthesis
(b) Reduces transpiration
(c) Protects leaves from grazing animals
(d) Gives colour to leaves

(iv) Hydathodes
   (a) Transpiration
   (b) Absorption of water
   (c) Photosynthesis
   (d) Guttation

(v) Grana of chloroplast is not the:
   (a) Site of Light Independent Phase
   (b) Site of Light Dependent Phase
   (c) Site of Photolysis
   (d) Site of Photon Absorption

Question 7

The diagram given below presents an experiment to demonstrate a particular aspect of Photosynthesis. The letter 'A' indicates a certain condition inside the flask:
Answer the Questions:



(i) What is the aim of the experiment?
   (a) To show that oxygen is released during photosynthesis
   (b) To show that photosynthesis occurs in the presence of KOH
   (c) To show that chlorophyll is necessary for photosynthesis
   (d) To show that carbon dioxide is necessary for photosynthesis

(ii) What is the special condition inside the flask?
   (a) Air inside the flask is free of oxygen
   (b) Air inside the flask is free of carbon dioxide
   (c) Air inside the flask is free of nitrogen
   (d) KOH purifies the air inside the flask

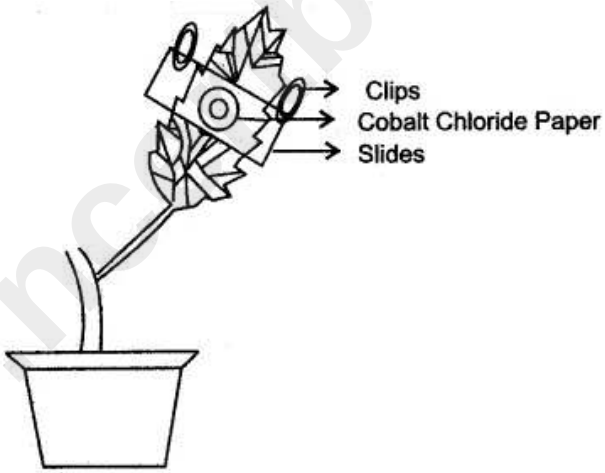
(iii) An alternative chemical that can be used instead of KOH is:
   (a) Sodium Hydroxide
   (b) Sodium Chloride
   (c) Potassium Chloride
   (d) Potassium Permanganate

(iv) In what manner, do the leaves 1 and 2 differ at the end of the starch test?
   (a) Leaf 1 turns brown, Leaf 2 turns blue black
   (b) Leaf 1 turns blue black, Leaf 2 turns blue brown
   (c) Leaf 1 turns purple, Leaf 2 remains green
   (d) There is no change in the colour of the leaves

(v) What is the important step that should be taken before performing this experiment?
   (a) The plant should be placed in dark for 24 hours to destarch the entire plant.
   (b) The plant should be placed in dark for 24 hours to remove chlorophyll from the leaves
   (c) The plant should be placed in dark for 24 hours to destarch the leaves
   (d) The plant should be placed in dark for 24 hours for the roots to absorb water

Question 8

Given below is the diagram of an experiment step-up to study the process of Transpiration. Cobalt chloride papers are fixed on the upper as well as lower surface of the leaf. Answer the question that follow:



(i) What is the aim of the experiment?
   (a) To prove that more transpiration occurs from the lower surface of a dicot leaf
   (b) To prove that more transpiration occurs from the upper surface of a dicot leaf
   (c) To prove that transpiration is equal on both sides of the leaf
   (d) To prove that transpiration does not take place in a dicot leaf

(ii) What is the colour of dry Cobalt Chloride paper?
   (a) Pink
   (b) Blue
   (c) Brown
   (d) White

(iii) After about an hour, what change, if any, would you expect to find in the cobalt chloride paper placed on the upper and lower surface of the leaf?

(a) Upper Surface – Pink, Lower Surface – Blue
(b) Upper Surface – White, Lower Surface – Blue
(c) Upper Surface – less Pink, Lower Surface – more Pink
(d) Upper Surface – more Pink, Lower Surface – less Pink

(iv) Two adaptation in plants to reduce transpiration are: _____

(a) Narrow Leaves, Thin cuticles
(b) Fewer Stomata, Broad lamina of leaves
(c) Thin cuticles, Sunken stomata
(d) Narrow leaves, Fewer stomata

(v) The rate of transpiration is less when there is:

(a) High humidity in the air and low temperature
(b) Less humidity in the air and decrease in atmospheric pressure
(c) Bright sunlight and high temperature
(d) More wind and low intensity of sunlight

Solution

Time: 1 hr **Total Marks: 40**

Answer 1

(i) Photophosphorylation
(ii) Lenticels
(iii) Root pressure
(iv) Recessive
(v) 44 + XX chromosomes

Answer 2

(i) Telophase
(ii) rr
(iii) Hypertonic
(iv) Thymine
(v) Genes

Answer 3

(i) Nicotinamide Adenine Dinucleotide Phosphate
(ii) Creates a suction force for absorption of water from the soil
(iii) 3 : 1
(iv) Xylem
(v) S - Phase

Answer 4

(i) It is the division of nucleus during cell division.
(ii) Out of a pair of contrasting alleles present together, only the dominant allele is able to express itself while the recessive remains supressed.
(iii) It is a sudden change in one or more genes in an organism's cells which is heritable.
(iv) It is the synthesis of glucose from carbon dioxide and water by green plants using light energy.
(v) It is the loss of water in the form of water vapour from the aerial parts of the plant.

Answer 5

(i) Around the centrioles in animal cells
(ii) Around the stoma
(iii) Conducts water and minerals in leaves
(iv) Found only in animal cells
(v) Present on chromosomes

Answer 6

(i) Gives rigidity and shape to plant cells.
(ii) It is the point of attachment of two sister chromatids.
(iii) Reduces transpiration.
(iv) Guttation.
(v) Site of light independent phase.

Answer 7

(i) To show that carbon dioxide is necessary for photosynthesis.
(ii) Air inside the flask is free of carbon dioxide.
(iii) Sodium hydroxide.
(iv) Leaf 1 turns brown, Leaf 2 turns blue black.
(v) The plant should be placed in dark for 24 hours to destarch the leaves.

Answer 8

(i) To prove that more transpiration occurs from the lower surface of a dicot leaf.
(ii) Blue
(iii) Upper surface - less pink, lower surface – more pink
(iv) Narrow leaves, Fewer stomata
(v) High humidity in the air and low temperature.