



Estd. 1861

BOYS' HIGH SCHOOL AND COLLEGE
FIRST TERM EXAMINATION (2024-25)
CLASS - X
BIOLOGY (SCIENCE PAPER – 3)

TIME: 2 Hours

MM:80

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

Section – A (40 Marks)

(Attempt all questions from this Section)

Question 1

Choose the correct answers from the given options.

(Do not copy the question, write the correct answer only)

[15]

- i. The synthesis of DNA is completed in:
 - a. M phase
 - b. S phase
 - c. G1 phase
 - d. G2 phase
- ii. The phenotypic monohybrid ratio in F2 generation is:
 - a. 3:1
 - b. 1:3
 - c. 2:2
 - d. 1:2:1
- iii. Swelling of wooden doors and windows during rainy season is caused by:
 - a. Endosmosis
 - b. Osmosis
 - c. Imbibition
 - d. Capillarity
- iv. The individual flattened stacks of membranous structures inside the chloroplast are known as:
 - a. Grana
 - b. Thylakoids
 - c. Stroma
 - d. Cristae
- v. Cytokinin are predominantly present in:
 - a. Permanent tissue
 - b. Meristematic tissue
 - c. Endodermis
 - d. Cortical region
- vi. The cell component visible only during cell division is:
 - a. Mitochondria
 - b. Chloroplast
 - c. Chromatin
 - d. Chromosome
- vii. The recessive gene expresses itself in:
 - a. Heterozygous condition
 - b. Homozygous condition
 - c. Y linked inheritance.
 - d. F2 - generation
- viii. Marine fish when placed in tap water bursts because of:
 - a. Endosmosis
 - b. Diffusion
 - c. Exosmosis
 - d. Plasmolysis
- ix. Maximum water evaporates from which part of the leaves during transpiration?
 - a. Cuticle
 - b. Xylem vessels
 - c. Epidermis
 - d. Spongy- mesophyll cells
- x. The plant hormone responsible for rapid cell division and delays ageing in plants is :
 - a. Gibberellin
 - b. Cytokinin
 - c. Auxin
 - d. Abscisic acid.
- xi. Chromosomes become visible as fine, long threads in:
 - a. Metaphase
 - b. Prophase
 - c. Interphase
 - d. Telophase
- xii. Which one of the following does not affect the rate of transpiration?
 - a. Humidity
 - b. Light intensity
 - c. Wind
 - d. Age of the plant
- xiii. A de-starched plant is one whose:
 - a. Leaves are free from chlorophyll
 - b. Aerial parts are free from starch
 - c. Leaves are free from starch
 - d. Plant is free from starch
- xiv. The points where two non-sister chromatid cross over are called:
 - a. Chiasmata
 - b. Centromere
 - c. Chromatid
 - d. Chromomere
- xv. Formation of ATP from ADP is termed as:
 - a. Photophosphorylation
 - b. Dark reaction
 - c. Photosynthesis
 - d. Photolysis



Question 2

- (i) **Name the following:** [5]
- The repeating component of each DNA strand length.
 - The basic functional unit of solar energy which is absorbed by the pigment chlorophyll.
 - The directional movement of plants towards a stimulus.
 - The scientific name of the plant which Mendel used for his experiments on inheritance.
 - The type of chromosome whose centromere is in the middle.
- (ii) **Choose the odd one out from the following terms and name the category to which the other belongs.** [5]
- Transpiration, Photosynthesis, Phagocytosis, Guttation
 - Auxin, Ethylene, Cytokinin, Adrenaline
 - Phosphate, RNA, Sugar, Nitrogenous base
 - Chicken pox, Haemophilia, Colour blindness, Albinism
 - Isotonic, Hypertonic, Osmosis, Hypotonic
- (iii) **State whether the following statements are true or false. If false, rewrite them correctly.** [5]
- Nitrogen bond are present between the complimentary nitrogenous bases of DNA.
 - The cell sap of root hairs is isotonic.
 - The two arms of a chromosome is called centromere.
 - Raisins swell up in a medium which is hypertonic solution.
 - Lower the atmospheric pressure, higher the rate of transpiration.
- (iv) **Match the column** [5]

Column A	Column B
1. Mitosis	a. The expressed gene of an allele
2. Dominant gene	b. Chromosome number is reduced
3. Meiosis	c. Similar chromosomes of the same shape and size
4. Mutation	d. Identical daughter cells
5. Homologous chromosomes	e. Sudden change in gene

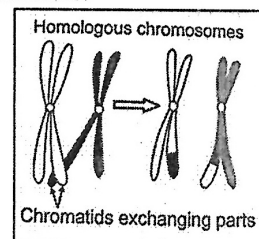
- (v) **Write the exact location and function of each of the following:** [5]
- Lenticle
 - Hydathode
 - Thylakoid
 - Stroma
 - Centromere

SECTION – B

(Attempt any four question from this section)

Question 3

- What are autosomes? [1]
- Explain turgidity? How is it useful to the plants? [2]
- State the difference light reaction and dark reaction. [2]
- Write two differences between ethylene and abscisic acid. [2]
- The given figure represents a certain phenomenon that occurs during meiosis: [3]
 - Name and define the phenomenon.
 - State the difference between chromosome and chromatid.
 - What are homologous chromosomes?



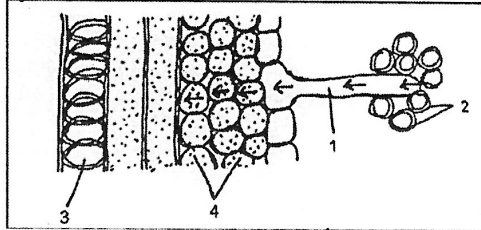
Question 4

- Expand the following abbreviations: [1]
 - NADPH
 - RuBP
- Explain the term plasmolysis. Give one application of this phenomenon in our daily life. [2]
- What is ascent of sap. Also mention the forces which enable it. [2]
- Draw a well labelled diagram of a chloroplast. [2]
- In a homozygous pea plant, axial flowers [A] are dominant over terminal flowers [a]. [3]
 - Draw a Punnett square to show the gametes and offspring when both the plants have heterozygous round seeds [Aa].

- b. What is the phenotypic and genotypic ratio of the cross shown above.
 c. Name any one X- linked disease found in humans.

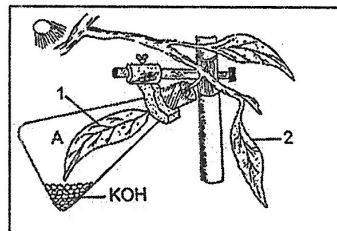
Question 5

- (i) Why is abscisic acid called as a stress hormone ? [1]
 (ii) Differentiate between stomatal and lenticular transpiration. [2]
 (iii) State Mendel's law of 'purity of gametes'. [2]
 (iv) Draw a well labelled diagram to show the metaphase stage of mitosis in a plant cell having four chromosomes. [2]
 (v) The figure given below is a diagrammatic representation of a part of the cross section of the root. Study the same and answer the questions: [3]
- Name the parts indicated by guidelines 1 to 4.
 - Which is the process that enables the passage of water from the soil into the root hair.
 - Name and define the pressure that is responsible for the passage of water in the direction indicated by the arrows.



Question 6

- (i) What is active absorption in plants. [1]
 (ii) Distinguish between interphase and mitotic phase of cell cycle. [2]
 (iii) What are tropic movements? Explain with an example. [2]
 (iv) With the help of neat sketches show how cytokinesis differs in plants and animal cells. [2]
 (v) The figure given below represents an experiment to demonstrate a particular aspect of photosynthesis. The alphabet 'A' represents a certain condition inside the flask. [3]
- What is the aim of the experiment.
 - Identify the special condition 'A' inside the flask.
 - In what manner do leaves 1 and 2 differ at the end of starch test.



Question 7

- (i) What is apical dominance? Name the hormone that controls it. [1]
 (ii) Enumerate the steps involved in testing a green leaf for the presence of starch. [2]
 (iii) Give reason why potato cubes when placed in water become firm and increase in size. [2]
 What will happen to the cubes when they are kept in sugar solution?
 (iv) Explain what happens to the end products of photosynthesis? [2]
 (v) Draw a monohybrid cross. Also mention the phenotypic and genotypic ratio. [3]

Question 8

- (i) A plant cell is kept in a hypertonic salt solution for about 30 minutes. What will be the change in its water content. [1]
 (ii) Write the reactions for the following: [2]
 a. Photolysis of water b. Photophosphorylation
 (iii) Differentiate between transpiration and guttation. [2]
 (iv) Draw a neat and labelled diagram of the structure of DNA. [2]
 (v) The diagram given below represents a plant movement. Observe and answer the questions: [3]
- Name and define the tropic movement shown in the diagram.
 - Label the part 'A'. What is the part A attracted to?
 - Give an example of a plant which shows thigmotropism.

