THE BRIGADE SCHOOL

Total points 17.5/25

Subject: BIOLOGY Class X

This paper consists of
PART 2- SUBJECTIVE TYPE - 25 marks

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PART 2- SUBJECTIVE TYPE

0 of 0 points

Max.Marks: 25

Name : *

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Class : *

10 A

School : *

TBSG

ANSWER THE FOLLOWING QUESTIONS

4 of 4 points

Each Question Carries 2 Marks

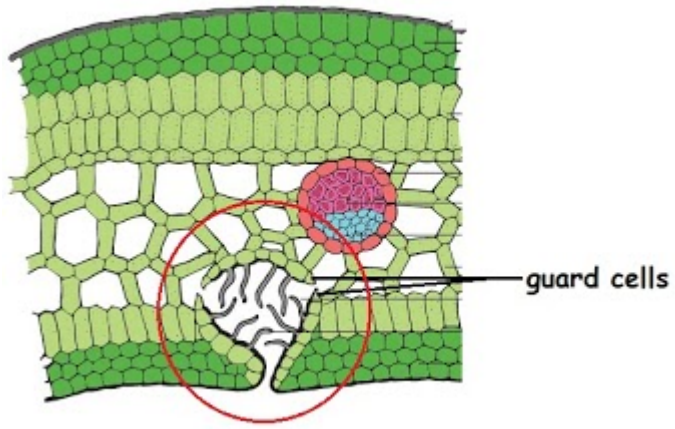
✓ 1. Explain why inheritance of colour blindness is also called criss cross inheritance. * 2/2

Inheritance of color blindness is also called criss - cross inheritance because the gene of color blindness is on the X - chromosome. So, color blindness will be passed from mother(carrier) to her son and from father(color blind) to daughter. Thus, inheritance of color blindness is also called criss - cross inheritence.

Feedback

Ans: Gene for colour blindness is located on X chromosome. Thus this trait is passed to son from carrier mother and to daughter from colour blind father. Therefore, inheritance of colour blindness is an example of criss-cross inheritance.

✓ 2. The diagram given below represents a transverse section of a leaf. (i) Identify and explain the adaptation shown in the diagram (ii) Mention a plant where these structures would be seen. * 2/2



(i) The adaptation shown in the diagram is of a sunken stomata. In this the stomata is sunken or covered by hair to reduce excessive transpiration.
(ii) This can be seen in Nerium.

Feedback

Ans: (i) Sunken stomata as an adaptation to reduce excessive transpiration.
(ii) Nerium plant

ANSWER THE FOLLOWING QUESTIONS 6 of 6 points

Each Question Carries 3 Marks

✓ 1. Differentiate between the following pair of terms based on the criteria mentioned within brackets: (i) genome and gene (definition) (ii) hydathodes and stomata (location) (iii) nucleotide and nucleosome (composition) * 3/3

(i) Gene is a specific sequence of a nucleotide present on the DNA or RNA of a chromosome which determine the hereditary characteristics, where as, genome is the full complement of DNA(including genes and intergenic region) of an organism.
(ii) Hydathodes are located on the tips of the leaves where as stomata is located on the epidermal layer of the leaves.
(iii) Nucleotide is composed of phosphate, pentose sugar and nitrogenous bases, where as, nucleosome is composed of histone octamer(8 histone proteins) and DNA.

Feedback

Ans: (i) genome is the full complement of DNA of an organism whereas gene is a specific part of a chromosome which determines the heredity characters.
(ii) hydathodes are present on the margins of leaf whereas stomata are present on the upper and lower epidermis of leaf.
(iii) nucleotide is composed of sugar, phosphate and nitrogenous bases whereas nucleosome is composed of DNA strand wound around a core of histone octamer

✓ 2. Mention the three characteristics of root hair that promote water absorption. * 3/3

(a) Large surface area provided by the root hair and rootlets.
(ii) Root hairs containing the cell sap of higher concentration than surrounding water.
(iii) Root hair have thin walls.

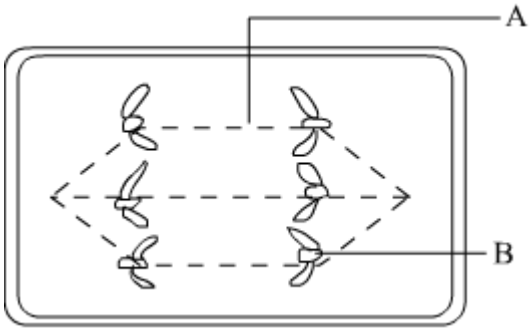
Feedback

(i) Surface area provided by rootlets and root hair is enormous.
(ii) Root hair contains cell sap of a higher concentration than that of the surrounding water which allows movement of water by osmosis.
(iii) Root hair has thin freely permeable cell wall and cell membrane is selectively permeable which allow the movement of water molecules and dissolved substances in and out of the cell.

ANSWER THE FOLLOWING QUESTIONS 7.5 of 15 points

Each Question Carries 5 Marks

✕ 1.a) The diagram given represents a certain stage of mitosis: (3 marks)(i) Identify the stage of cell division.(ii) Name the parts labelled A and B.(iii) What is the unique feature observed in this stage?(iv) How many daughter cells are formed from this type of cell division? * 2/3



(i) Anaphase
(ii) A- Spindle fibers and B-seperated sister chromatids.
(iii) The unique feature is that at this stage there is a furrow in animal cell but not in plant cell.
(iv) Two daughter cells are formed.

Feedback

(i) Anaphase (1/2 marks)
(ii) A: spindle fibre; B: centromere (1/2 + 1/2 marks)
(iii) Centromere splitting leads to separation of sister chromatids which then move towards opposite poles (1 mark)
(iv) This type of cell division (mitosis) results in the formation of two daughter cells (1/2 marks)

✕ 1. b) Give any two examples for turgor movement in plants. (2marks) * 1/2

~ The rapid closing of leaves seen in mimosa pudica when we touch its leaves.
~ Movement of certain animals towards the sun.

Feedback

ANS:
(i) On touch the rapid drooping of the leaves of sensitive plants like Mimosa pudica
(ii) Leaves of insectivorous plants close up to entrap a living prey.

✓ 2. a) “The sex of the children is determined by what they inherit from their father and not their mother.” Justify. (1mark) * 1/1

The sex of a child depends on the chromosome, that is, if there is an X and Y chromosome, male is born and if both are X chromosome it will be a female. X and Y chromosome can be formed only by a male(father) because only he has X and Y chromosome. Mother has only X chromosomes. Thus it can be said that - “The sex of the children is determined by what they inherit from their father and not their mother.”

Feedback

Ans: It is because a child who inherits an X chromosome from her father will be a girl and one who inherits a Y chromosome from his father will be a boy. But all children inherit a X chromosome from their mother regardless of whether they are boys or girls

✗ 2. b) A red colour flower plant denoted by Rr is cross bred with that of white colour flower plant denoted by rr. (2 marks)(i) Mention the genotype and state the phenotype of the flowers you would expect in their F1 generation plants.(ii) State the expected ratio of the genotypes in the F2 progeny if the first generation parent plants crossed were of the genotype RR and rr. * 0/2

(i) Genotype - 1:3
Phenotype - 2:2
(ii) Genotype ratio would be 1

Feedback

(i) genotype: Rr and rr
phenotype: red flowered plant and white flowered plant, respectively.
(ii) genotypic ratio: RR:Rr:rr
1:2:1

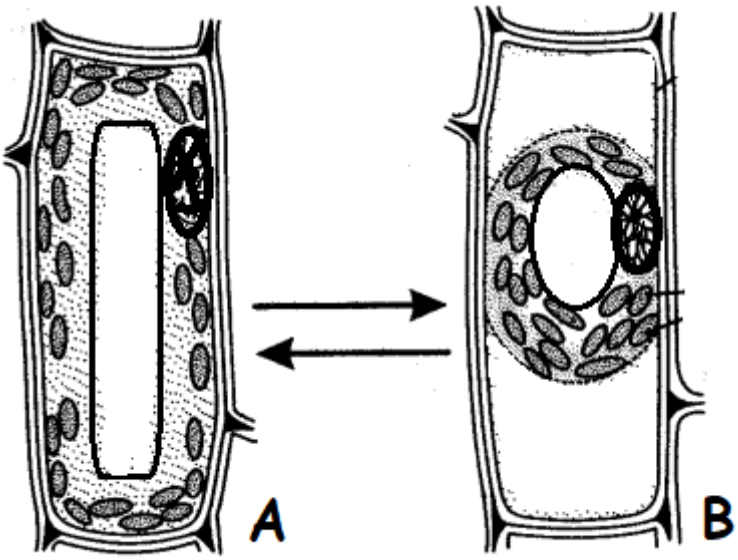
✕ 2. c) What is Cell cycle? What is its non-dividing phase called? * 0.5/2

Cell cycle is the series of events that takes place inside the cell to form new cells.
The non-dividing phase is called M-phase or interphase.

Individual feedback

Ans: Cell cycle is a series of events that take place in a cell leading to the duplication of its DNA and the subsequent division of the cell to produce two daughter cells.
The non-dividing phase of cell cycle is called Interphase
CELL CYCLE ANSWER IS INCOMPLETE
YOU CANNOT WRITE BOTH ANSWERS M AND I PHASE.

✓ 3. a) Given below is the diagram of a cell as seen under the microscope after having been placed in a solution. (3 marks) (i) Is the cell given below a plant cell or an animal cell? Give two reasons in support of your answer as evident from the diagram.(ii) Define the phenomenon that lead to the condition of cell B (iii) What would you do to bring cell B back to its original condition A? * 3/3

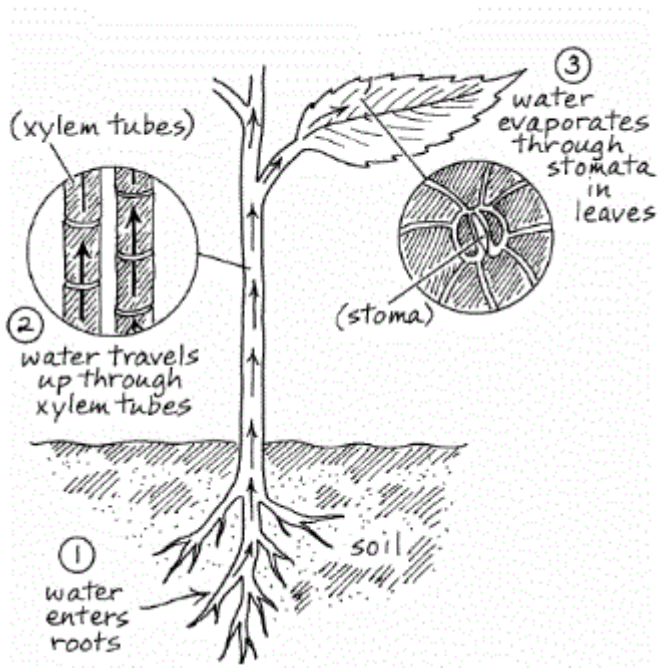


(i) The diagram is of a plant cell as it has a cell wall which is absent in the animal cell.
(b) The phenomenon is plasmolysis - contraction of cytoplasm from cell wall caused due to withdrawal of water when placed in hypertonic solution.
(c) The cell should be kept in hypotonic water to regain the original condition

Feedback

ANS:
i) The given cell is a plant cell because it has
1) Clear distinct cell wall
2) Chloroplast is present in the cytoplasm.
3) large central vacuole
4) position of the nucleus is peripheral
ii) Plasmolysis is the contraction of cytoplasm from the cell wall caused due to withdrawal of water when placed in a hypertonic solution.
iii) Place it in a hypotonic medium or plain water for some time

✕ 3. b) (i) Mention any two other sites in plant from where the phenomenon shown in the diagram can occur.(ii) Name the two properties that produces a continuous water column through the stem. * 0/2



(ii) Ascent of sap and suction force

(i) _

Feedback

(i) cuticle and lenticel
(ii) cohesion and adhesion