



ST. LAWRENCE HIGH SCHOOL

A JESUIT CHRISTIAN MINORITY INSTITUTION
FIRST TERM EXAMINATION- 2019



Sub: BIOLOGICAL SCIENCE

Class: XI -A1

F.M: 70

Duration: 3 hours 15 Minutes

Date: 09.08.2019

SECTION -I

1. Choose the correct answer:

1x14=14

- i) Which of the following disease is caused by viroids?
Potato Spindle Tuber Disease
- ii) Which of the following is not a moss?
Marchantia
- iii) Primary endosperm nucleus is
Triploid
- iv) Bryophytes have _____ life cycle.
Haplo-diplontic
- v) Pleurobrachia belongs to
Ctenophora
- vi) Sea-horse belongs to
Pisces
- vii) Which of the following is not present in roots?
Region of differentiation
- viii) Rhizophora has
Pneumatophores
- ix) Lemon has _____ placentation
Axile
- x) Axoneme is present in
flagella
- xi) Microbodies are present in
Both plants and animals
- xii) Which of the following is an aromatic amino acid?
Tyrosine
- xiii) Which of these stages has no growth?
G0
- xiv) Which of the following is involved in stomatal opening and closing
Potassium

SECTION-II GROUP -A

1x4=4

Answer the following questions:-

1. What do you mean by 'dikaryophase'?
A phase of lifecycle of cell in which two nuclei are present with in one cell. When plasmogamy or fusion of cytoplasm is not followed by fusion of nucleus in fungi it is called dikaryophase.
2. What is 'indented key'?
The indented key is the most commonly used key in taxonomic literature such as floras, manuals, etc. In this type of a dichotomous key, the successive couplets are indented (from the original margin) continuously, leading to the identification of the taxon.
Or
What are 'monographs'?
A Monograph has some common characteristics with books and review (survey) papers. A monograph is a special type of book written on a single specialized topic, devoted mainly for research works. It is a comprehensive taxonomic study of a plant group on worldwide basis.
3. What is 'chemotaxonomy'?
The uses of chemical characters of plants in classification or in solving taxonomic problems is called chemotaxonomy or chemical taxonomy. It is based on the chemical constitution of plants. The fragrance and taste vary from species to species.
Or
What is 'Omega taxonomy'?

It is the modern experimental taxonomy, in which the taxonomic activities have been enriched with data from ecology, phyto-chemistry, phyto-geography, cyto-genetics and physiology coupled with adequate computation.

4. Give an example of an alga which is diplontic .
Fucus

GROUP-B

2x5=10

Answer the following questions:-

5. Differentiate between homosporous and heterosporous . Give an example of a pteridophyte which is heterosporous.
The main difference between homosporous and heterosporous is that the homosporous is the production of a single type of spores with the same size whereas the heterosporous is the production of two types of spores, megaspores and microspores, with different sizes. Furthermore, most seedless vascular plants and bryophytes are homosporous while all seed plants and some pteridophytes are heterosporous.
An example of a pteridophyte which is heterosporous is Selaginella or Salvinia
6. What is pseudometamerisation? Give an example of an organism which has pseudometameric segmentation along with its phylum.
Pseudometamerism, either the segmentation is only external or the segments behave independently not as a unit, or both. The metamerism arrangement of internal organs without external metamerism
E.g- Tapeworm(PHYLUM- PLATYHELMINTHES)
7. What are choanocytes? Name the fresh water sponge.
Choanocytes are flagellated cells with a collar of protoplasm at the base of the flagellum, numbers of which line the internal chambers of sponges.
The fresh water sponge is Spongilla

Or

How are hemichordates different from chordates?

Both hemichordates and chordates are coelomates. Hemichordates are worm-like, marine animals while chordates live in water, land, and air. The main difference between Hemichordata and Chordata is that Hemichordata contains an epidermal nervous system whereas Chordata contains a central nervous system.

8. What is marginal placentation?
The ovary in which the placenta forms a ridge along the ventral suture of the ovary and the ovules develop on two separate rows is known to have marginal placentation.
This type of placentation is found in peas.

Or

What is the structure of embryo in monocotyledonous seed?

The embryos of monocotyledons have only one cotyledon. In grass family (Gramineae), this cotyledon is called scutellum. It is situated towards lateral side of embryonal axis. This axis at its lower end has radicle and root cap enclosed in a sheath called coleorhiza. The part of axis above the level of attachment of scutellum is called epicotyl. It has as shoot apex and few leaf primordia enclosed in a hollow foliar structure called coleoptile. Epiblast represents rudiments of second cotyledon.

9. What is facilitated diffusion ? What type of substances are transported through it.
Facilitated diffusion (also known as facilitated transport or passive-mediated transport) is the process of spontaneous passive transport (as opposed to active transport) of molecules or ions across a biological membrane via specific transmembrane integral proteins.
Examples of molecules that must use facilitated diffusion to move in and out of the cell membrane are glucose, sodium ions, and potassium ions. They pass using carrier proteins through the cell membrane without energy along the concentration gradient.

Or

What is a polysome? What is its function?

A complex of ribosomes strung along a single strand of messenger RNA. In eukaryotes, polyribosomes are attached to the surface of the rough endoplasmic reticulum and the outer membrane of the nucleus; in bacteria they are found free in the cytoplasm.
Function: translates the genetic information coded in the messenger RNA during protein synthesis.

GROUP – C

Answer the following questions:-

3x9= 27

10. What is the importance of herbarium in taxonomy?

(3)

Herbaria can be used to:

- 1 . Discover or confirm the identity of a plant or determine that it is new to science (taxonomy);*
- 2 . Document the concepts of the specialists who have studied the specimens in the past (taxonomy);*
- 3 . Provide locality data for planning field trips (taxonomy, systematics, teaching);*
- 4 . Provide data for floristic studies (taxonomy);*
- 5 . Serve as a repository of new collections (taxonomy and systematics);*
- 6 . Provide data for revisions and monographs (systematics);*
- 7 . Verify Latin plant names (nomenclature);*
- 8 . Serve as a secure repository for "type" specimens (taxonomy);*
- 9 . Provide infrastructure for obtaining loans, etc., of research material (taxonomy, systematics);*

Or

What are the different types of classification of species?

(3)

11. Differentiate between gram positive and gram negative bacteria? What are chemosynthetic autotrophs?

(2+1)

Characteristics	Gram positive	Gram negative
Gram Reaction	Retain crystal violet dye and stain blue or purple.	Accept safranin and stain pink or red
Cell Wall Structure	Peptidoglycan, Teichoic acid Lipoteichoic acid	Lipopolysaccharide, Lipoproteins and Peptidoglycans
Peptidoglycan Layer	Thick (Multilayered)	Thin (Single layered)

Chemosynthetic bacteria are organisms that use inorganic molecules as a source of energy and convert them into organic substances. Chemosynthetic bacteria, unlike plants, obtain their energy from the oxidation of inorganic molecules, rather than photosynthesis.

E.g-methanogenic archaea

12. Mention four important characteristics of Phaeophyceae. Write any one of its economic importance. (2+1)
- **Phaeophyta are the most complex forms of algae. The cell walls are composed of cellulose and alginic acid (a complex polysaccharide).**
 - **The food reserves contain sugar, higher alcohol and other complex forms of polysaccharides.**
 - **The members of phaeophyta belonging to Laminariales are called kelps.**
 - **Similar to other evolved algal species, reproduction of this algae takes place by both sexual and asexual means.**
- ECONOMIC IMPORTANCE:**
- ▶ **In recent times, phaeophyta are extensively exploited for the extraction of alginic acid, which is used for deriving alginate, a major colloidal gel used as a stabilizer, emulsifier or binder in many industrial applications.**
 - ▶ **Apart from alginic acid, agar, carrageenans are also derived from phaeophyta.**
 - ▶ **Commercially, alginate is used in fabric printing, baking, toothpastes, soaps, ice creams, meat preservation, etc.**
 - ▶ **In addition, phaeophyta is used as a food source. The brown algae, laminaria is cultivated on man-made algal ponds (using ropes) for the production of food supplements and alginates.**

Or

How is protonema different from leafy stage in mosses? What are gemmae? (2+1)

Protonema stage is a thread like chains of cell that forms a earlier stage of the haploid phase of the mosses. When a moss first grow from a spore its spore as a protonema.

The leafy stage is develops from the secondary protonema as a lateral has a erect, slender and leafy like structure .

A gemmae is an asexual budlike propagule capable of developing into a new individual. The gemmae, often formed in structures called gemma cups. The production of gemmae is a widespread means of asexual reproduction in both liverworts and mosses.

13. What do you understand by the term 'triploblastic'? Name an organism with biradial symmetry and mention its phylum. (2+1)
- Triploblastic organisms have body tissues derived from three germ layers, the endoderm, mesoderm, and ectoderm, seen in all multicellular animals except certain invertebrates such as the cnidarians and sponges. At its simplest, the mesoderm provides a network of packing cells around the animal's organs; this is probably best exhibited in the phylum Platyhelminthes (flatworms).**
- An organism with biradial symmetry is Pleurobrachia and its phylum is Ctenophora**

Or

What are the fundamental characters of chordates? Why is Ascidia called a Urochordate? (2+1)

(2+1)

- **The dorsal hollow nerve cord derives from ectoderm that rolls into a hollow tube during development. In chordates, it is located dorsal to the notochord. In contrast, other animal phyla are characterized by solid nerve cords that are located either ventrally or laterally. The nerve cord found in most chordate embryos develops into the brain and spinal cord, which compose the central nervous system.**
 - **Pharyngeal slits are openings in the pharynx (the region just posterior to the mouth) that extend to the outside environment. In organisms that live in aquatic environments, pharyngeal slits allow for the exit of water that enters the mouth during feeding. Some invertebrate chordates use the pharyngeal slits to filter food out of the water that enters the mouth. In vertebrate fishes, the pharyngeal slits are modified into gill supports, and in jawed fishes, into jaw supports.**
 - **The post-anal tail is a posterior elongation of the body, extending beyond the anus. The tail contains skeletal elements and muscles, which provide a source of locomotion in aquatic species, such as fishes. In some terrestrial vertebrates, the tail also helps with balance, courting, and signaling when danger is near. In humans, the post-anal tail is vestigial, that is, reduced in size and nonfunctional.**
- Ascidia have (1) a permanent or temporary notochord, in the form of a dorsal rod; (2) a central nervous system, in the form of a dorsal tube; (3) a pharynx provided with gill slits or pharyngeal pouches, and a ventral gland secreting iodoproteins (endostyle or thyroid); and (4) a muscular tail. So they are Tunicates or Urochordates**

14. Distinguish between 'racemose' and 'cymose' inflorescence. In which plant whorled phyllotaxy is observed? (2+1)

	Racemose inflorescence	Cymose inflorescence
(i)	The main axis continues to grow.	The main axis terminates in a flower.
(ii)	Growth is unlimited.	Growth is limited.
(iii)	The flowers are borne in an acropetal succession.	Flowers are borne in a basipetal succession.
(iv)	The grouping of flowers is less common and arrangement of flowers in a group is centripetal.	The grouping of flower is more common and arrangement of flowers in a group is centrifugal.

Whorled phyllotaxy is observed in *Alstonia*

Or

Differentiate between epigynous and hypogynous flowers. Name a zygomorphic flower. (2+1)

Hypogynous

1. Thalamus is convex or conical.
2. Androperianth is borne below the level of ovary.
3. Ovary is superior. Other parts are inferior.
4. Thalamus is not fused with the wall of ovary;

Epigynous

1. Thalamus is usually flask shaped.
 2. Androperianth is borne above the level of ovary.
 3. Ovary is inferior while other parts are superior.
 4. Thalamus is fused with the wall of ovary.
- A zygomorphic flower: snapdragon/pea

15. What are the three types of leucoplasts on their functions? What is primary cell wall? (2+1)

Leucoplasts are classified into three groups:

- amyloplasts (which store starch),
- elaiplasts or oleoplasts (store lipids),
- aleuroplasts (store proteins).

Amyloplasts are responsible for storing starch, which is a nutritive polysaccharide found in plant cells, protists and some bacteria. Growing plant cells are surrounded by a polysaccharide-rich primary wall. This wall is part of the apoplast which itself is largely self-contiguous and contains everything that is located between the plasma membrane and the cuticle. The primary wall and middle lamella account for most of the apoplast in growing tissue. In the primary (growing) plant cell wall, the major carbohydrates are cellulose, hemicellulose and pectin. The cellulose microfibrils are linked via hemicellulosic tethers to form the cellulose-hemicellulose network, which is embedded in the pectin matrix.

16. Differentiate between secondary and tertiary structure of proteins. Name one quaternary protein present in our body. (2+1)

(2+1)

Secondary structure is how the chains on amino acids interact with each other to form beta barrels and alpha helixes. This structure is determined by hydrogen bonds between the different amino acids.

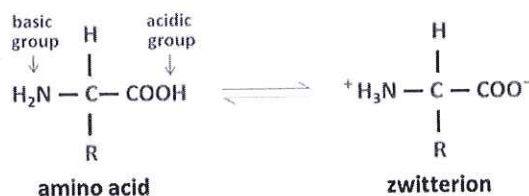
Tertiary structure is when the secondary structures interact with each other through disulphide bonds, hydrogen bonds, hydrophobic/hydrophilic interactions etc. This is all determined by the placement of certain amino acids within the proteins secondary structure. Salt bridges, ionic interactions between positively and negatively charged sites on amino acid side chains, also help to stabilize the tertiary structure of a protein.

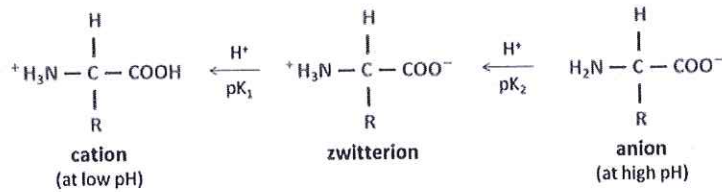
One quaternary protein present in our body is haemoglobin.

Or

What is a 'Zwitterionic configuration'? Name a simple lipid and its chemical name. (2+1)

Amino acids are the best-known examples of zwitterions. They contain an amine group (basic) and a carboxylic group (acidic). The -NH₂ group is the stronger base, and so it picks up H⁺ from the -COOH group to leave a zwitterion (i.e. the amine group de-protonates the carboxylic acid):





A simple lipid is Glycerol. Its chemical name is propane-1, 2,3-triol

17. What are the differences in cytokinesis of plant and animal mitosis. (3)

Cytokinesis is the division of the cytoplasm that occurs as one of the last steps in cellular division. The biggest and most noticeable difference between plant and animal cytokinesis is that plants form a cell plate while dividing, whereas animal cells form a cleavage furrow from periphery to the centre. The rigid cell wall (in plants) prevents the formation of cleavage furrow during cytokinesis; instead, a cell plate forms to separate the parent cell into two daughter cells, and a new cell wall forms along the cell plate. During telophase, plant cells phragmoplast forms in the center of the cell and proceeds to the periphery. Animal cells have centrioles that support the organization of mitotic spindle and completion of cytokinesis. Plant cells don't have centrioles.

Or

Explain the importance of interphase. (3)

The purpose of interphase is to promote cellular growth and preparation for division. The purpose of interphase is to prepare and check environmental conditions to ensure successful cellular division. The purpose of interphase is to produce replicated and synthesized DNA for cell division. While prokaryotic cells, like bacteria, replicate through binary fission, eukaryotic cells divide through mitosis or meiosis. Only sexually reproducing cells go through meiosis, but all eukaryotic cells use mitosis as a means of duplicating. Interphase is an integral part of the cell cycle that prepares a cell for mitosis by producing proteins and duplicating chromosomes. Interphase was once considered the "resting stage" of the cell cycle because microscopy could not detect movement in the cells. It is now known, however, that interphase is a period of great growth and essential preparation for mitosis.

G1 Stage

Interphase begins with G1, which stands for "Gap 1." During G1, cells grow and synthesize proteins needed for mitosis. These proteins also activate the cell's metabolism and break down carbohydrates and lipids to transform this food into energy. Chromosomes inside the cell have not yet replicated in G1, so each chromosome contains only one DNA molecule.

S Phase

S phase follows G1; its major function involves replicating the cell's DNA. The "S" name stands for synthesis. By using enzymes, the cell copies the DNA molecules of each chromosome. After S phase completes, chromosomes have two chromatids, meaning each chromosome has two molecules of DNA. This stage is not distinctly visible through a microscope because material inside the cell is too diffuse.

G2 Stage

After S phase, a cell enters G2, or "Gap 2," and it involves another period of growth. The cell synthesizes more proteins, and organelles like mitochondria grow and divide. The cell also resumes normal functions like transforming food into fuel; cells stock up on this energy for its use in mitosis. G2 is the final step before a cell enters the first stage of mitosis.

18. Mention any two deficiency symptoms in plants. What is the function of Nitrogenase? (2+1)

Plants may exhibit typical Mg deficiency symptoms, and when in high excess, K deficiency may also occur. Older leaves will be yellow in color with interveinal chlorosis (yellowing between the veins) symptoms. Plant growth will be slow and some plants may be easily infested by disease.

Nitrogenase is a complex enzyme, with the most common form containing two proteins termed the molybdenum iron (MoFe) protein (dinitrogenase) and the Fe protein (dinitrogenase reductase). Nitrogenase is rapidly destroyed by oxygen, in vitro and in vivo, so nitrogen-fixing organisms face the problem of protecting their nitrogenase from inactivation by oxygen. The need to protect nitrogenase becomes particularly important in the cyanobacteria, which evolve oxygen photosynthetically. Nitrogenase is an enzyme responsible for catalyzing nitrogen fixation, which is the reduction of nitrogen (N₂) to ammonia (NH₃) and a process vital to sustaining life on Earth.

Or

What is critical concentration? What is ammonification? (1+2)

Critical Concentration is the term which is used to define the concentration of essential elements below which the growth of plant is Retarded or Reduced. Also, if the concentration of essential elements rise above the critical concentrations, it leads to Toxicity.

When a plant or animal dies or an animal expels waste, the initial form of nitrogen is organic. Bacteria or fungi convert the organic nitrogen within the remains back into ammonium (NH₄⁺), a process called ammonification or mineralization.

GROUP- D

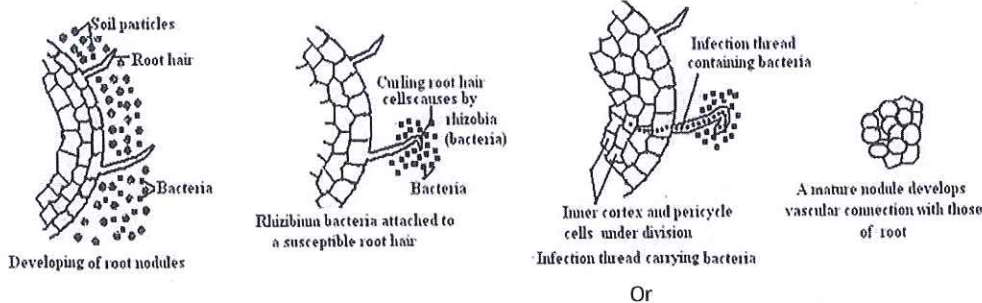
Answer the following questions:-

19. Describe nodule formation in plants. (5)

5x3=15

Multiple interactions are involved in the formation of root nodules:

- 1) The Rhizobium bacteria divide and form colonies. These get attached to the root hairs and epidermal cells.
- 2) The root hairs get curled and are invaded by the bacteria.
- 3) This invasion is followed by the formation of an infection thread that carries the bacteria into the cortex of the root. The bacteria get modified into rod-shaped bacteroides.
- 4) As a result, the cells in the cortex and pericycle undergo division, leading to the formation of root nodules.
- 5) The nodules finally get connected with the vascular tissues of the roots for nutrient exchange.



Or

Describe the prophase of meiosis I.

(5)

- At the start of prophase I, the chromosomes have already duplicated. During prophase I, they coil and become shorter and thicker and visible under the light microscope.
- The duplicated homologous chromosomes pair, and crossing-over (the physical exchange of chromosome parts) occurs. Crossing-over is the process that can give rise to genetic recombination. At this point, each homologous chromosome pair is visible as a bivalent (tetrad), a tight grouping of two chromosomes, each consisting of two sister chromatids. The sites of crossing-over are seen as crisscrossed nonsister chromatids and are called chiasmata (singular: chiasma).
- The nucleolus disappears during prophase I.
- In the cytoplasm, the meiotic spindle, consisting of microtubules and other proteins, forms between the two pairs of centrioles as they migrate to opposite poles of the cell. The nuclear envelope disappears at the end of prophase I, allowing the spindle to enter the nucleus.

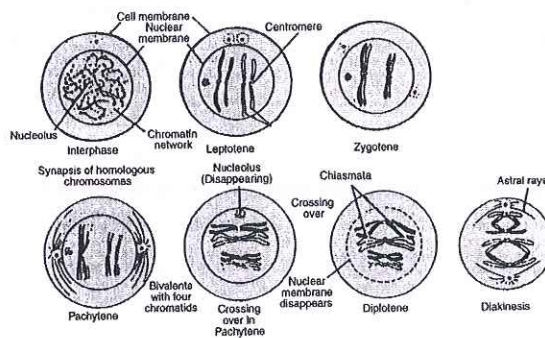


Fig. : Prophase I of meiosis I

20. Write the important characteristics of the phylum Arthropoda .Name one living fossil.

(4+1)

Characteristic features of Phylum Arthropoda

- The body structure shows bilateral symmetry.
 - They are triploblastic.
 - They can be found in all types of habitats – land, water and soil.
 - They have jointed limbs.
 - The body is segmented into three regions – Head, Thorax and Abdomen.
 - The body cavity is filled with blood and is called the haemocoel. The blood is white in colour.
 - The exoskeleton is hardened and is made of chitin.
 - They have a well-developed central nervous system.
 - The head is well developed and bears the sensory organs and brain.
 - They have compound eyes and mosaic vision.
 - The digestive tract is complete with the mouth and anus at opposite ends of the body.
 - They have an open circulatory system with dorsal heart and arteries.
 - Respiration is through the general body surface or by gills in aquatic forms and through trachea or book lungs in terrestrial forms. Sexes are separate and sexual dimorphism is exhibited.
- One living fossil -Ginkgo Biloba, Horseshoe Crabs

Or

Write the characteristics of Cnidarians. What is 'metagenesis'?

(4+1)

General characteristics of Phylum Coelenterata

- Habitat: aquatic, mostly marine. Solitary or colonial. Each individual is known as zooid.
- Symmetry: radially symmetrical

- **Grade of organization:** tissue grade of organization; diploblastic, outer ectoderm and inner endoderm. Mesogloea separates these two layers
- The body has a single opening called hypostome surrounded by sensory tentacles.
- **Coelom:** gastrovascular cavity or coelenteron.
- **Nematocyst:** organ for capturing and paralyzing prey, present in tentacles
- **Nutrition:** holozoic
- **Digestion** is both intracellular and extracellular.
- Many forms exhibit polymorphism i.e. Polyp and medusa
- Polyps are sessile, asexual stage
- Medusa are free swimming, sexual stage
- **Metagenesis:** asexual polypoid generation alternate with sexual medusoid generation
- **Reproduction:** Asexual: by budding, Sexual: by gamatic fusion, Fertilization: internal or external

The alternation of a sexual phase and an asexual phase in the life cycle of an organism. The two phases, or generations, are often morphologically, and sometimes chromosomally, distinct. E.g.- Cnidaria

21. Differentiate between Basidiomycetes and Phycomycetes (any three) .Which group of fungi is called ' Fungi Imperfecti' and why?

(3+2)

Phycomycetes are the lower fungi whose mycelium is aseptate and cenocytic. *Rhizopus*

Asexual reproduction: Zoospores, Aplanospores, Chlamydospores, Sporangiospore

Sexual Reproduction: Isogamy, Oogamy

Fruiting body: Zygosporangium

Examples: *Mucor*, *Rhizopus*

Basidiomycetes are also the club fungi which are the advanced group of fungi which are dikaryotic and have secondary mycelium.

Asexual reproduction: Basidiospores, Oidia

Sexual Reproduction: Somatogamy, Basidiospores formed on sterigmata.

Fruiting body: Basidiocarp

Examples: *Agaricus*, *Polyporus*, *Puccinia*, *Ustilago*

The 'imperfect fungi' are kept in class deuteromycetes. They are called as imperfect because

- Sexual reproduction is absent in these forms.
- They reproduce only by asexual spores called conidia.

Or

Describe the structure of dinoflagellates. Write any two important characteristics of diatoms. (3+2)

Dinoflagellates are unicellular and possess two dissimilar flagella arising from the ventral cell side (dinokont flagellation). They have a ribbon-like transverse flagellum with multiple waves that beats to the cell's left, and a more conventional one, the longitudinal flagellum, that beats posteriorly. The transverse flagellum is a wavy ribbon in which only the outer edge undulates from base to tip, due to the action of the axoneme which runs along it. The axonemal edge has simple hairs that can be of varying lengths. The flagellar movement produces forward propulsion and also a turning force. The longitudinal flagellum is relatively conventional in appearance, with few or no hairs. It beats with only one or two periods to its wave. The flagella lie in surface grooves: the transverse one in the cingulum and the longitudinal one in the sulcus, although its distal portion projects freely behind the cell. In dinoflagellate species with desmokont flagellation (e.g., *Prorocentrum*), the two flagella are differentiated as in dinokonts, but they are not associated with grooves.

Dinoflagellates have a complex cell covering called an amphiesma or cortex, composed of a series of membranes, flattened vesicles called alveolae (amphiesmal vesicles) and related structures. In armoured dinoflagellates, these support overlapping cellulose plates to create a sort of armor called the theca or lorica, as opposed to athecate dinoflagellates. These occur in various shapes and arrangements, depending on the species and sometimes on the stage of the dinoflagellate. Conventionally, the term tabulation has been used to refer to this arrangement of thecal plates. The plate configuration can be denoted with the plate formula or tabulation formula.

The important characteristics of the class Bacillariophyceae are:

1. They are commonly unicellular and free-living but some members form colonies of various shapes like filaments, mucilaginous colonies
2. Microscopic cells are of different shapes. They may be oval, spherical, triangular, boat-shaped etc.
3. Plant bodies are either bilateral or radial in symmetry.
4. The cells are surrounded by a rigid cell wall, called frustule, consisting of upper epitheca and lower hypotheca; arranged in the form of a box with its lid.
5. The cell wall is composed of pectic substances impregnated with high amount of siliceous substance.
6. The wall may have secondary structures like spines, bristles etc.
7. Vegetative cells are diploid (2n).
8. The cells generally have many discoid or two large plate-like chromatophores. Some cells possess stellate chromatophore.
9. The photosynthetic pigments are chlorophyll a, chlorophyll c along with xanthophylls like fucoxanthin, diatoxanthin and diadinoxanthin.
10. Reserve food is oil, volutin and crysolaminarin.
11. Some vegetative cells show gliding movement.
12. Motile structure (antherozoid) has single pantonematic flagellum.
13. Vegetative multiplication takes place by cell division, which is very common. Some of the cells become very much reduced in size.
14. They produce characteristic spore, the auxospore that develops to regain the normal size.
15. Sexual reproduction takes place by isogamy and oogamy.
