Chap 7 (Kingdom Protoctista or Protista) F.Sc 1st Year Biology Notes

Chapter 7: Kingdom Protoctista or Protista

(Short Questions Answers)

Differentiate between diatoms and dinoflagellates.

The cell wall of each diatom consists of two shells that overlap where they fit together, much like a Petri dish. Silica is deposited in the shell, and this glass-like material is laid down in intricate (complex) patterns. While dinoflagellates are mostly unicellular. Their cells are often covered with shells of interlocking cellulose plates impregnated with silicates.

What are foraminiferans? Give their importance.

These marine protozoans produce shells (or tests). Tests of foraminifera are made of calcium. The shells or tests contain pores through which cytoplasmic projections can be

extended. These cytoplasmic projections form a sticky interconnected net that entangles prey. Foraminiferans of the past have created vast limestone deposits.

What are dinoflagellates? or Write down two characteristics of dinoflagellates.

Dinoflagellates are mostly unicellular, animal-like protists. Their cells are often covered with shells of interlocking cellulose plates impregnated with silicates.

On what principle protists are grouped together?

Although some have multiple cells, most protists are one-celled or unicellular organisms. These cells have a nucleus and are enclosed by a cell membrane. For this reason, protists are often grouped either in the "animal-like protists" group, "plant-like protists" group, or the "fungus-like protists" group.

Name two plant-like protists groups.

Algae are plant-like protists e.g., Euglenoids, Dinoflagellates, Ditoms etc.

What kind of photosynthetic pigments are found in plants and algae?

Five types of chlorophylls occur in plants other than bacteria—a, b, c, d and e. Out of these only two chlorophylls occur in the chloroplasts of higher plants, a and b. In addition to green chlorophyll a and yellow and orange carotenoids, which are photosynthetic pigments found in all algae, different algae phyla possess a variety of other pigments (such as xanthophylls and phycoerythrin) that are also important in photosynthesis.

Justify that Euglenoids are close to Zooflagellates.

These are small fresh water organisms. Based on molecular data, euglenoids are thought to be closely related to zooflagellates. They are plantlike in their pigments. One third of all genera have chloroplasts, the rest do not. Those which lack chloroplasts ingest or absorb their food. Euglenoids grown in the absence of light lose their chloroplasts and become heterotrophic. Pyrenoids produce carbohydrates.

Write a note on Brown algae.

Brown algae include the giants of the protist kingdom and range from a few centimetres to approximately 75 meters in length. All brown algae are multicellular. The largest brown algae, called the kelps, are tough and leathery in appearance. They

possess leaflike blades, stemlike stipes, and rootlike anchoring holdfast. Brown algae are common in cooler marine waters, especially along rocky coastlines in the intertidal zone.

What types of pigments are found in Rhodophyta and Chlorophyta?

Pigments found in Rhodophyta (red algae) are chlorophyll a, carotenes and phycoerythrin while in Chlorophyta (green algae) chlorophyll a, chlorophyll b, and carotenes.

How slime molds reproduce?

During unfavorable conditions, plasmodial slime mold forms resistant haploid spores by meiosis within stalked structures called sporangia. When conditions become favourable again, spores germinate into biflagellated or amoeboid, reproductive or swarm cells which unite to form diploid zygote. Zygote produces multinucleate plasmodium, each nucleus being diploid.

Give scientific name of plasmodial slime mold. Give its importance.

The scientific name of plasmodial slime mold is Physarum polycephalum. It has been used to study many fundamental biological processes such as: growth and differentiation, cytoplasmic streaming, the function of cytoskeleton.

Give characters of oomycotes or What are water molds?

Oomycotes (water molds) are close relatives of the fungi and have a similar structure, but are now regarded as more ancient group. Their cell walls contain cellulose, not chitin. Their hyphae are aseptate (without cross walls). Oomycotes include a number of pathogenic organisms, including downy mildew Phytophthora infestans.

What are actinopods.

These are marine protozoans which produce shells (or tests). Tests of actinopods are made of silica. The shells or tests contain pores through which cytoplasmic projections can be extended. These cytoplasmic projections form a sticky, interconnected net that entangles prey.

What are limestone deposits? How they are formed?

Foraminiferans of the past have created vast limestone deposits. The pyramids of Egypt were built of foraminiferal limestone. Limestone is formed under reasonably deep marine conditions from the gradual accumulation of minute calcite (calcium carbonate) sheils of foraminifera and other organisms (corals).

Write two characters of Zooflagellates, or Give the examples, form and mode of locomotion in Zooflagellates or What are zooflagellates?

These protists are mostly unicellular (a few are colonial) organisms with spherical or elongated bodies, and a single central nucleus. They possess from one to many long, whip-like flagella that enable them to move. Flagellates move rapidly, pulling themselves forward by lashing flexible flagella, that are usually, located at the anterior end. Examples are Trypanosoma, Trichonymphas, choanoflagellates.

What are diatoms? Give their importance.

A single-celled alga which has a cell wall of silica. Silica is deposited in the shell, and this glasslike material is laid down in complex patterns. Diatoms are the major producers in the aquatic (marine and freshwater) ecosystems because of their extremely large numbers. Diatoms are very important in aquatic food chains.

Give two examples each of the following: Green algae (Chlorophyta), Red algae (Rhodophyta), and Brown algae (Phaeophyta).

Green algae – Ulva, Chlorella, Acetabularia, Spirogyra, Red algae – Chondrus, Polysiphonia, Brown algae – Fucus, Macrocystis.

What kind of protists are included in Brown algae?

Brown algae include the giants of the protist kingdom and range from a few centimetres to approximately 75 meters in length.

What are Kelps? Give their parts.

Kelps are the largest brown algae which are tough and leathery in appearance. They possess leaflike blades, stemlike stipes, and rootlike anchoring holdfast.

What is the habitat of Brown algae?

Brown algae are common in cooler marine waters, especially along rocky coastlines in the intertidal zone.

What do you know about the red algae?

They have multicellular body that is commonly composed of complex interwoven (inter-linked) filaments that are delicate and feathery. A few red algae are flattened sheets of cells. Most multicellular red algae attach to rocks or other substances by a basal holdfast. Some red algae incorporate calcium carbonate in their cell walls from the ocean and take part in building coral reefs along with coral animals.

What are the similarities between green algae and the plants? or Write four characters of green algae similar to green plants.

- Both have chlorophyll a chlorophyll and carotenoids present in the chloroplasts
- Their main energy reserves are stored as starch.
- Most green algae and plant possess cell walls with cellulose
- Evidence from RNA sequencing also indicates that green algae and the plants form a monophyletic lineage

Give some characters of the feeding stage of slime mold or Myxomycota?

The feeding stage of slime mold is a plasmodium, a multinucleate mass of cytoplasm that can grow.to 30 cm (1 ft) in diameter. The plasmodium is slimy. in appearance, and found on damp, decaying logs and leaf litter. It often forms a network of channels that cover a large surface area. As it creeps along, it ingests bacteria, yeasts, spores and decaying organic matter.

What does slime mold do during unfavourable and favourable condition?

During unfavourable conditions, slime mold forms resistant haploid spores by meiosis within stalked structures called sporangia. When conditions become favourable again, spores germinate into biflagellated or amoeboid, reproductive or swarm cells which unite to form diploid zygote. Zygote . produces multinucleate plasmodium, each nucleus being diploid.

What is Physarum polycephalum?

The plasmodial slime mold, Physarum polycephalum is a model organism that has been used to study many fundamental biological processes, such as growth and differentiation, cytoplasmic streaming, and the function of cytoskeleton.

Why Phytophthora infestans was infamous 'in human history? OR What is infamous role of Phytophthora infestans in human history? or What is Irish

potato blight of 194 century?

Phytophthora infestans have played infamous (notorious, well-known) roles in human history as they were the cause of Irish potato famine of the 19th century. It causes a disease commonly known as late blight of potatoes. In Ireland in the 1840's, the water mold caused potato tubers to rot in the fields. Many people (250,000 to more than 1 million) starved to death.

What is the function of cytoplasmic projections in foraminiferans and actinopods?

These cytoplasmic projections form a sticky, interconnected net that entangles prey.

Green algae are considered ancestral organisms of green land plants. Discuss, or Why algae are considered as ancestral organism of green plants or Why it is generally accepted that plants arose from ancestral green algae?

Due to the presence of starch and cellulose cell wall, it is generally accepted that plants arose from ancestral green algae. Evidence from RNA sequencing also indicates that green algae and the plants form a monophyletic lineage.

Give two characteristics of slime molds.

- The feeding stage of slime is called plasmodium which is a multinucleate mass of cytoplasm that can grow to 30 cm (1 ft) in diamete
- During unfavourable condition, slime mold forms resistant haploid spore by meiosis within stalked structures called sporangia

Write two characteristics of ciliates, or Write down main futures of ciliaes.

- Ciliates are unicellular organisms with a flexible outer covering called a pellicle.
- They have several thousand fine, short, hair like structure called cilia for locomotion.
- They have two types of nuclei i.e., micronucleus and macronucleus.
- Most ciliates ingest bacteria or other tiny protists.
- Water regulation in freshwater ciliates is controlled by special organelles called contractile vacuoles.
- Most ciliates are capable of a sexual process called conjugation.

Differentiate between micronucleus and macronucleus of ciliates Or What are functions of micronucleus and macronucleus? or Describe the nuclei of ciliates.

Ciliates have two kinds of nuclei, one or more small diploid micronuclei that function in sexual process, and a large, polyploid macronucleus that controls cell metabolism and growth.

Write example of parasitic Apicomplexans. Give symptoms of malaria or Write a note on Plasmodium causing disease or Draw the life cycle of Plasmodium.

Plasmodium is the apicomplexan that causes malaria, Here is the life cycle of Plasmodium:

- It enters human blood through the bite of an infected female Anopheles mosquito.
- Plasmodium first enters liver cells and then red blood cells, where it multiplies.
- When each infected red blood cell bursts, many new parasites are released.
- The released parasites (merozoites) infect new red blood cells, and the process is repeated.
- The simultaneous bursting of millions of red cells causes the symptoms of malaria a chill, followed by high fever caused by toxic substances that are released and affect other organs of the body.
- Ultimately sexual forms i.e., gametocytes are formed which are taken up. when female Anopheles mosquito sucks the blood of malaria patients.
- Rest of the life cycle of Plasmodium is completed in mosquito until spindle. shaped parasites (sporozoites) are formed which stay in the salivary gland.

What are green algae?

Green algae have pigments, energy reserve products, and cell walls that are identical to those of plants.

How do protists flagellum evespot differ from plants and animals?

Protists do not develop from a blastula or an embryo.

Differentiate between foraminiferans and actinopods.

Tests of foraminifera are made of calcium where as those of actinopods are made of silica.

What are characteristics of fungus-like Protists?

Many of fungus-like protists have centrioles. They produce cellulose as a ..major component of their cell walls. Two major groups of fungus-like protists are

- Slime molds
- Water molds (oomycotes)

How do slime molds behave during unfavorable conditions?

During unfavourable conditions, slime mold forms resistant haploid spores by meiosis within stalked structures called sporangia.

Write four important features of algae.

- Algae are photosynthetic protists, carrying out probably 50 to 60 percent of all the photosynthesis on earth.
- Algae, are unicellular and the zygote is not protected by the parent body.
- Algae have thallus like body because their body cannot be differentiated into true roots, stems and leaves and lack xylem and phloem.
- Almost all algae are aquatic.

Differentiate between spore and cyst.

A spore is the reproductive part having a protective covering as aspore for its germination has to face harsh environmental conditions such as air currents whereas cyst is the group of cells which come together to protect themselves from harsh conditions. Cyst has nothing to do with the reproduction of the cell.