6. Describe briefly the four major groups of protozoa.
Solution:
All protozoans are heterotrophs and live as predators or. parasites. They are be-lieved to be primitive relatives of animals. They are classified into four groups on the basis of locomotory organelles.

1. Amoeboid protozoans: These organisms live in fresh water, sea water or moist soil. They move and capture their prey by developing pseudopodia (false feet) as in Amoeba. Some of them such as Entamoeba are parasites.
2. Flagellated protozoans: The members of this group are either free-living or parasitic. They have flagella for locomotion. The parasitic forms cause diseases such as sleeping sickness e.g., Trypanosoma.
3. Ciliated protozoans: These are aquatic, actively moving organisms because of the presence of thousands of cilia. They have a cavity (gullet) that opens to the outside of the cell surface. The coordinated movement of rows of cilia causes the water laden with food to be steered into the gullet e.g., Paramecium.
4. Sporozoans: This includes diverse parasitic organisms that have an infectious spore¬like stage in their life cycle. Locomotory organs are absent. The most notorious N . is Plasmodium (malarial parasite) which causes malaria which has a staggering effect on human population.

7. Plants are autotrophic. Can you think of some plants that are partially heterotrophic?
Solution:
Some insectivorous plants like Drosera, Nepenthes, Utricularia are partially heterotrophic plant. These plants are deficient in nitrogen content but are otherwise autotrophic. They, trap various insects to obtain nitrogen from them. Rest, the food i.e., carbohydrate is manufactured by themselves.

8. What do the terms phycobiont and mycobiont signify?
Solution:
A lichen is structurally organised entity consisting of the permanent association of a fungus and an alga. The fungal component of a lichen is called mycobiont and the algal component is called phycobiont. Both mycobiont and phycobiont are associated in symbiotic union in which the fungus is predominant and alga is subordinate partner. Fungus provides the structural covering that protects alga from unfavourable conditions, i.e., drought, heat, etc. It also traps moisture from the atmosphere and anchors the lichen to a rock, tree bark, leaves and other similar supports. The alga prepares organic food by the process of photosynthesis from carbon dioxide. If the algal component is cyanobacteria (blue-green alga), they fix atmospheric nitrogen in addition to preparation of food.

9. Organise a discussion in your class on the topic - 'Are viruses living or non-living'?
Solution:
Viruses are regarded as intermediate between non-living entities and living organisms. It is very difficult to ascertain whether they

are living or non-living. Some . characters of viruses suggest their non-living nature whereas many other characters suggest their living nature.
They resemble non-living objects in -

1. Lacking protoplast.
2. Ability to get crystallised.
3. Inability to live independent of living cell.
4. High specific gravity which is found only in non-living objects.
5. Absence of respiration.
6. Absence of energy storing system.
7. Absence of growth and division. Instead different parts are synthesized separately.

Viruses resemble living beings in -

1. Being formed of organic macromolecules which occur only in living beings.
2. Presence of genetic material.
3. Ability to multiply or reproduce although only inside living cell.
4. Occurrence of mutations.
5. Occurrence of enzyme transcriptase in most viruses.
6. Some viruses like Pox virus contains vitamins like riboflavin and biotin.
7. Infectivity and host specificity.
8. Viruses are 'killed' by autoclaving and ultraviolet rays.
9. They breed true to their type. Even variations are inheritable.
10. They take over biosynthetic machinery of the host cell and produce chemicals required for their multiplication.
11. Viruses are responsible for a number of infectious' diseases like common cold, epidemic influenza, chicken pox.

10. What are the characteristic features of Euglenoids?
Solution:
The euglenoid flagellates are the most interesting organisms having a mixture of animal and plant characteristics. The characteristic features are:

1. They are unicellular flagellates.
2. These protists lack a definite cellulose cell wall. Instead the cells are covered bya thin membrane known as pellicle. The pellicle is composed of protein, lipid and carbohydrates.
3. One or two flagella which help these protists in active swimming are present. If two flagella are present, then one is long and other is short. They are tinsel - shaped i.e., with two longitudinal rows of fine hairs. Each flagellum has its own basal granule. The two flagella join with each other at a swelling, called paraflagellar body and finally only one long flagellum emerges out through the cytostome.
4. Cell at the anterior end possesses an eccentric mouth or cytostome which leads into a flask-shaped cavity viz. gullet or cytopharynx. Gullet opens into a large basal reservoir.
5. At one end of the reservoir, the cytoplasm contains an orange red stigma (eye spot). The eye spot is a curved plate with orange-red granules and contains red pigment astaxanthin. Both paraflagellar body and eye spot act as photoreceptors.
6. Just below the reservoir is found a contractile vacuole having many feeding canals. The contractile vacuole takes part in osmoregulation. It expands and pumps its fluid contents in the reservoir.
7. The mode of nutrition in euglenoids is holophytic or photoautotrophic. Some euglenoids show mixotrophic nutrition (both holophytic as well as saprobic mode).
8. Cytoplasm is differentiated into ectoplasm and endoplasm. Nucleus is large and occurs roughly in middle. The envelope and nucleolus persist during cell division.

9. Each chloroplast is composed of a granular matrix traversed by 10-45 dense bands and is covered by 3-membraned envelope. They contain the photo¬synthetic pigments- chlorophyll - n, b. They store carbohydrates as paramylon bodies, scattered throughout the cytoplasm.
10. Asexual reproduction occurs by longitudinal binary fission. The flagellum is duplicated before cell division.
11. Under unfavourable condition the euglenoids form cysts to perennate the dry period.
12. Sexual reproduction is not observed.

********** END **********