

EXERCISE

SHORT QUESTIONS

2. What is meant by polyphyatic group?

Ans: The protist kingdom is a polyphyletic group of organisms, that is, protists do not share a single common ancestor. Any eukaryotic organism not considered a fungus, animal, or plant is classified in the kingdom Protista solely for convenience.

3. How do ciliates differ from protozoans?

Ans: Ciliates is a sub group of protozoa. Ciliates has hair like extensions called cilia, e.g., Paramecium. As they are the sub group of protozoa so they don't differ.

4. How do algae differ from plants?

Ans: Algae differ from the plants in this respect that the sex organs in algae are unicellular, the zygote is not protected the parent body and embryo is not formed.

5. What are the features that distinguish oomycotes from fungi?

Ans:

Oomycotes	Fungi
Cell wall composed of cellulose.	Cell wall composed of chitin.
It is motile.	It is immotile.
Diploid nuclei.	Haploid nuclei.
Usually un-pigmented vegetative and reproductive structures	Pigmentation is very common in hyphae or spores. Common pigments are melanin and carotenoids.
Oomycetes produce oospores during sexual reproduction.	Oospores are absent in true fungi.
Major energy reserve is Mycolaminarin.	Major energy reserve is Glycogen

6. What is zygospore and how it is formed?

Ans: Zygospore:

It is a thick-walled sexual spore produced by a zygomycote.

Formation:

Sexual reproduction takes place by **conjugation**. When hyphae (stolon) of opposite mating types meet, hormones are produced that cause the tips of the hyphae to come together and to **form gametangia**, structures that produce gametes. These structures become separated from rest of the mycelium by the formation of **septa**. Plus, and minus nuclei, then fuse to form a diploid nucleus, the **zygote**. The zygote develops into **zygospore**.

7. How fungi resemble plants?

Ans: Fungi resemble plants because they have cell wall, lack centrioles and both are multicellular organisms.

8. How fungi get their nutrition?

Ans: The mode of nutrition in fungi is heterotrophic. Digestion takes place outside the body and nutrients are absorbed directly. If carbohydrate is stored, it is usually as glycogen and not starch.

9. What are the methods of asexual reproduction in fungi?

Ans: Following are three methods for asexual reproduction in fungi.

- (i) Mitosis (ii) Budding (iii) Fragmentation

10. Name few fungi from which antibiotics are obtained.

Ans: Following are the names of the fungi from which antibiotics are obtained.

- (i) *Penicillium chrysogenum*.
(ii) *Tolypocadium inflatum*.
(iii) *Penicillium nigrkans*.

11. Give examples of edible fungi.

Ans: Following are the examples of edible fungi.

- (i) *Aspergillus tamari* is used to produce soya sauce.
(ii) *Agaricus* is an edible mushroom usually used in pizza.

- (iii) Morels have fruiting body i.e. ascocarp which is use as food.

12. Define/Describe/Explain briefly:

Mutualism, parasitism, plankton, amoeboid motion, contractile vacuole, zooflagellates, acomplexans, thallus, euglenoid, dianoflagellates, diatoms, brown algae, red algae, kelp, green algae, gametangia, zooplankton, mycology, mycelium, zygosporangium, conidia, dikaryote, ascocarp, basidiocarp, cyclosporine, griseofulvin, lichens, mycorrhizae, humus, histoplasmosis, ergotism

Ans: Mutualism:

Mutualism, a more or less equal partnership, in which both organisms are equally benefited.

Parasitism:

Parasitism is a relation between organisms, in which one organism lives on or in another and is metabolically dependent on another organism.

Plankton: Most of protists are aquatic and live in oceans or freshwater. They make up a part of the plankton.

OR

Planktons are small organisms that float or drift in great numbers of bodies in salt or fresh water. Plankton is a primary food source for many animals, and consists of bacteria, protozoans, certain algae, cnidarians, tiny crustaceans such as copepods, and many other organisms.

Amoeboid motion:

Amoeboid movement is the most common mode of locomotion in eukaryotic cell. It is a crawling-like type of movement accomplished by protrusion of cytoplasm of the cell involving the formation of pseudopodia ("false feet") and posterior uropods.

Contractile vacuole:

A membrane-enveloped cellular organelle, found in many microorganisms, that periodically expands, filling with water, and then contracts, expelling its contents to the cell exterior. Thus, it is important in maintaining hydrostatic equilibrium.

Zooflagellates:

Protozoans that move by means of flagella are called **zooflagellates**.

Apicomplexans:

Apicomplexans is a large group of parasitic protozoa. Some cause diseases in man e.g. *Plasmodium* (malarial parasite).

Thallus:

In multicellular algae e.g. sea weeds, the body is branched or leaf like called thallus.

Euglenoid: **Euglenoids** are small freshwater organisms e.g. *Euglena*.

Dinoflagellates:

A single-celled organism with two flagella, occurring in large numbers in marine plankton and also found in fresh water some produce toxins that can accumulate in shellfish, resulting in poisoning when eaten. Dinoflagellates vary in colour from yellow green to brown.

Diatoms:

Diatoms are the most numerous unicellular algae in the oceans. They are also plentiful in freshwater. The cell wall has two halves, with the larger halves acting as a "lid" for the smaller half.

Brown algae:

Brown algae range from small forms with simple filaments to large multicellular forms up to 75 meter in length, live in cooler marine water.

Red algae:

Red algae are multicellular present chiefly in warmer seawater growing in both shallow and deep waters. They can be up to a meter long attached to rocks or other substances by basal holdfast.

Kelp: The large brown algae called **kelps**.

Green algae:

Green algae (*al-gi*) live in the ocean but are more likely found in freshwater and can even be found on land e.g. *Chlamydomonas*, *Spirogyra*, *Volvox*, *Chlorella*, and *Ulva*.

Gametangia:

A gametangium (plural: gametangia) is an organ or cell in which gametes are produced that is found in many multicellular protists, algae, fungi, and the gametophytes of plants.

Zooplankton:

In oceans, freshwater lakes and ponds are **zooplanktons** that feed on phytoplanktons, and are important as primary consumers in the food chain.

Mycology:

Fungi (singular, fungus) can live in darkness & also in light. The study of fungi is called mycology

Mycelium:

The thallus or the body of most fungi is a multicellular structure known as mycelium.

Zygospor:

It is a thick-walled sexual spore produced by a Zygomycote.

Conidia:

Asexual reproduction involves production of spores called conidia (singular: *Conidium*) or **conidiospores** (Gk: *konis, dust, and spora, seed*). Conidia vary in shape, size and may be multicellular. There are no sporangia in Ascomycotes. The conidia develop directly on the tips of modified aerial hyphae called **conidiophores**. The colour of conidia is what gives the characteristic brown, blue, pink or other tint to many of these molds.

Dikaryote: **Sexual reproduction** takes place after two hyphae grow together and their cytoplasm mingles. Within this fused structure, nuclei from the parent hyphae pair but do not fuse. New hyphae develop from the fused structure and the cells of these hyphae are **dikaryotic**.

Ascocarp:

The $n + n$ hyphae form a fruiting body known as **ascocarp**. The **asci** develop in the ascocarp. The asci are usually surrounded by sterile hyphae. An ascocarp is a **fruiting body**.

Basidiocarp:

Basidiomycotes are included in the phylum **Basidiomycota**. Included in this phylum are mushrooms, bracket fungi, rust, smut and puffballs. These structures are all fruiting bodies called **basidiocarps**.

Cyclosporine:

Cyclosporins are obtained from soil fungus (*Tolypocadium inflatum*) is used in organ transplantation for preventing transplant rejection.

Griseofulvin:

Griseofulvin obtained from a fungus (*Penicillium nigricans*) is used to inhibit fungal growth.

Lichens:

Mutualism is the association in which both partners are benefitted. The two key **mutualistic symbiotic association** formed by the fungi are lichens and mycorrhizae.

Lichens are an association between a fungus (mostly Ascomycotes and a few Basidiomycotes), a cyanobacterium or green alga. The body of lichen has three layers. The upper layer is thin and tough which consists of fungal hyphae. The middle layer consists of fungal hyphae interwoven with photosynthetic cell. Bottom layer consists of loosely packed fungal hyphae.

Mycorrhizae:

Mycorrhizae are mutualistic relationships between soil fungi and the roots of most plants. The hyphae help in the direct absorption of phosphorous, zinc, copper and other nutrients from the soil into the roots. Plants whose roots are

invaded by mycorrhizae grow more successfully than do plants without mycorrhizae.

Humus:

Humus is an important constituent of soil and essential for the proper growth of plants. It is formed from the organic waste material through the activities of fungi and bacteria.

Histoplasmosis: **Histoplasmosis** is a serious infection of the lungs caused by inhaling spores of a soil fungus.

Ergotism: **Ergotism** is caused by purple ergot rye. It causes nervous spasm, convulsion, psychotic delusion and even gangrene.

13. Write the differences between:

- (a) Mutualism and parasitism
- (b) Zooflagellates and ciliates
- (c) Aseptate and septate hyphae
- (d) Oogonium and antheridium
- (e) Oospore and zygospore
- (f) Mycelium and conidium
- (g) Oospore and conidia
- (h) Monokarotic and dikaryotic cell
- (i) Fungi and plants
- (j) Fungi and animals
- (k) Zygomycota and basidiomycota
- (l) Sporangium and ascocarp
- (m) Ascus and basidium
- (n) Endomycorrhizae and ectomycorrhizae

Ans: (a) mutualism and parasitism:

Mutualism	Parasitism
Mutualism, a more or less equal partnership, in which both organisms are equally benefited.	Parasitism is a relation between organisms, in which one organism lives on or in another and is metabolically dependent on another organism.
In mutualism both organisms get benefits	In parasitism, only one organism gets the benefit.
Example: Lichen and Mycorrhizae	Example: Human and a worm (the one in the stomach) are having the parasitism

(b) Zooflagellates and ciliates:

Zooflagellates	Ciliates
Zooflagellates move with the help of flagella.	Ciliates move with the help of cilia.
They have single central nucleus.	They have two nuclei.
Example: Trypanosoma.	Example: Paramecium.

(c) Aseptate and septate hyphae:

Septate hyphae	Aseptate hyphae
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Septate hyphae have cross-walls (called septa) that divide the cytoplasm into segments	Nonseptate hyphae have no cross walls and are just long, continuous tubes of cytoplasm.
They have openings called pores between cells	They lack pores.
They have slowly transport nutrients.	They allow quick transport of nutrients.

(d) Oogonium and antheridium:

Oogonium	Antheridium
The female gametangium is called oogonium	The male gametangium is called an antheridium
Oogonium is female reproductive part of Algae and fungi.	They are male organs of oomycota, bryophytes and pteridophytes.
An Oogonium forms a large number of male gametes.	An antheridium forms a large number of male gametes.
They are immotile.	The male gametes produced in an antheridium are usually motile.

(e) Oospore and zygospore:

Oospore	Zygospore
They are thick walled cells found in water molds	A thick-walled sexual spore found in zygomycote

They result by the fusion of male nuclei with egg in oogonium.	They result by the fusion of fungal hyphae.
It may or may not undergo meiosis	Under goes meiosis.
They are produced in oomycota.	They are produced in zygomycota.

(f) Mycelium and conidium:

Mycelium	Conidium
The thallus of fungi is called mycelium.	The spores of ascomycota are called Conidium.
They are immotile.	They are motile.
They are not brightly coloured.	They are brightly colored e.g blue, pink, or brown
They develop by a network of fungal hyphae	They develop by asexual reproduction in conidiospores.

(g) Oospore and conidia:

Oospore	Conidia
They are thick walled cells found in water molds	The spores of ascomycota are called Conidium
They are immotile.	They are motile.

They are formed as a result of sexual reproduction	They are formed as a result of asexual reproduction
They are produced in oomycota.	They are produced in ascomycota.

(h) Monokarotic and dikaryotic cell:

Monokarotic cell	Dikaryotic cell
Monokarotic cell characterized by single nucleus	Dikaryotic cell is characterized by two nuclei.

(i) Fungi and plants:

Fungi	Plants
Fungi have no chlorophyll and therefore cannot make their own food.	Plants have chlorophyll and therefore can make their own food.
Fungi cell do not differentiate and therefore Fungi have no roots, stems, leaves, bark, etc.	Plants have roots, stems, leaves and bark, etc.
Fungi cell walls are made of chitin.	Plant cell walls are made of cellulose.
Fungi generally are the decomposers of the ecosystem.	Plants are the producers in ecosystem.
Fungi may be septate or aseptate	Plants have a definite cell wall.
Fungus reproduce by spores	Plants reproduce by seeds.

Examples: Yeasts, Mold and Mushrooms.	Examples: Trees, moss and bushes.
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(j) Fungi and Animals:

Fungi	Animals
They have cell walls.	They do not have cell walls.
They do not have tissue and sense organs.	They have tissue and sense organs.
There method of nutrient intake is absorption.	There method of nutrient intake is ingestion.
Fungi don't move under their own power.	Animals move by cilia, flagella, or muscular structures so they are motile.

(k) Zygomycota and basidiomycota:

Zygomycota	Basidiomycota
Zygomycota is the division of fungi having sexually produced zygospores.	Basidiomycota comprises fungi bearing the spores on a basidium called basidiospores.
They are called conjugating fungi.	They are called club fungi.
They are non-septate.	They are septate.

Example: Rhizopus nigricans	Example: Mushrooms, rusts and smut
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(l) Sporangium and ascocarp:

Sporangium	Ascocarp
It is a spore bearing structures.	It is a fruiting body of ascomycota.
They are usually spherical and rounded.	They have different shapes i.e club shaped, flask shaped.
It produces and liberates spores.	They further produce ascospore.

(m) Ascus and basidium:

Ascus	Basidium
They are the fruiting bodies of ascomycota.	They are clubbed shaped structures on hyphae of basidiomycota.
Ascus produces spores inside their bodies.	They produce spores on their external surface.
They produce ascospores.	They produce basidiospores.

(n) Endomycorrhizae and ectomycorrhizae:

Endomycorrhizae	Ectomycorrhizae
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<p>Endomycorrhizae have an exchange mechanism on the inside of the root.</p>	<p>Ectomycorrhizae live only outside of the root.</p>
<p>Endomycorrhizae penetrate only into the outer cells of plant root forming coils, swellings and minute branches and also extend out into surrounding soil.</p>	<p>Ectomycorrhizae form a mantle that is exterior to the root, and they grow between cell walls.</p>
<p>Examples:</p> <p>Most Vegetables, Grasses, Flowers, Shrubs, Fruit Trees, and Ornementals</p>	<p>Examples:</p> <p>These are mostly formed with pines, firs etc.</p>

