

## Objective

1. The feeding stage of a smile mold is called:
 

(A) Rhizoids      **(B) Plasmodium**      (C) Hyphae      (D) Mycelium
2. Cell wall in oomycotes is chemically composed of:
 

(A) Proteins      **(B) Cellulose**      (C) Lignin      (D) Chitin
3. Which of the following is not present in protists?
 

(A) Cilia      (B) Neck      (C) None of these      **(D) Embryo**
4. Margulis and Schwartz accommodate the diverse assemblage of organisms of protista into:
 

(A) 10 phyla      (B) 5 phyla      (C) 37 phyla      **(D) 27 phyla**
5. RNA sequencing also indicates that green algae and the plants form a:
 

(A) Biphyletic lineage      (B) Tetrachyletic lineage  
(C) Polyphyletic lineage      **(D) Monophyletic lineage**
6. An outer flexible covering of ciliates is:
 

(A) Cuticle      **(B) Pellicle**      (C) Sheath      (D) Cell wall
7. The causative agent of African sleeping sickness is:
 

(A) Mosquito      (B) Trichonymphas      (C) Tse - tse fly      **(D) Trypanosoma**
8. Amoebic dysentery in:
 

(A) Trypanosoma      (B) Plasmodium  
**(C) Entamoeba histolytica**      (D) Amoeba
9. African sleeping sickness is transmitted by:
 

(A) Plasmodium      **(B) Tse tse fly**      (C) Trypanosoma      (D) Mosquito
10. Entamoeba histolytica cause amoebic:
 

(A) Migraine      (B) Fever      **(C) Dysentery**      (D) Cholera
11. The tsetse fly of African countries transmits trypanosome, the cause of:
 

(A) Malaria      **(B) Sleeping sickness**      (C) Lung infection      (D) Measles
12. The protozoans having two kinds of nuclei:
 

(A) Actinopods      (B) Zooflagellates      (C) Amoeba      **(D) Ciliates**
13. Trypanosoma is an example of:
 

(A) Ciliates      **(B) Zooflagellates**      (C) Actionopods      (D) Apicomplexans
14. Amoeba moves and obtains food by means of:
 

(A) Cilia      (B) Flexing      **(C) Pseudopodia**      (D) Flagella
15. Pelomyxa palustris is an example of:
 

(A) Algae      **(B) Amocba**      (C) Cilliate      (D) Bacterium
16. Pelomyxa Palustris is commonly called:
 

(A) Trichonymphas      (B) Trypanosoma      **(C) Giant amoeba**      (D) Entamoeba

17. The example of zooflagellates is:  
 (A) Vorticella       (B) Entamoeba       (C) Forams       (D) Trypanosoma
18. Most ciliates are capable of a sexual process called:  
 (A) Mating       (B) Plasmogamy       (C) Conjugation       (D) Oogamy
19. One of the most unusual protist phylum is that of:  
 (A) Oomycetes       (B) Dinoflagellates       (C) Euglenoids       (D) Zooflagellates
20. What regulation in freshwater ciliates is controlled by special organelles called:  
 (A) Golgi apparatus       (B) Lysosomes       (C) Contractile vacuoles       (D) Vacuoles
21. Complex specialized flagellates with many flagella are:  
 (A) Vorticella       (B) Euglena       (C) Trypanosoma       (D) Trichonymphs
22. The protists that live as symbionts in the guts of termites and help in the digestion of dry wood are:  
 (A) Vorticella       (B) Trypanosoma       (C) Euglena       (D) Trichonymphs
23. Members of phylum chrysophyta are commonly called:  
 (A) Dinoflagellates       (B) Diatoms       (C) Red Algae       (D) Brown Algae
24. Algae which take part in building coral reefs along with coral animals are:  
 (A) Red algae       (B) Green algae       (C) Diatoms       (D) Brown algae
25. Ceratium belongs to group of algae called:  
 (A) Brown Algae       (B) Dinoflagellates       (C) Red Algae       (D) Diatoms
26. Diatoms belong to phylum:  
 (A) Pyrrophyta       (B) Phaeophyta       (C) Chrysophyta       (D) Rhodophyta
27. The largest brown algae are called:  
 (A) Gelidium       (B) Dinoflagellates       (C) Diatoms       (D) Kelps
28. Length of brown algae range from few centimeters to:  
 (A) 75 cm       (B) 70 meters       (C) 75 meters       (D) 170 meters
29. Most green algae possess cell wall with:  
 (A) Pectin       (B) Cellulose       (C) Silica       (D) Chitin
30. Phycoerythrin is found in:  
 (A) Blue green algae       (B) Brown algae       (C) Red algae       (D) Green algae
31. Which of the following possess leaf like blades, stem like stipes, and root like anchoring holdfast?  
 (A) Phytophthora       (B) Kelps       (C) Agaricus       (D) Eucalyptus
32. Photosynthetic protists, carry out probably 50 to 60 percent of all the photosynthesis on earth are:  
 (A) Oomycetes       (B) Cyanobacteria       (C) Algae       (D) Plants
33. Which of the following is not present in protists?  
 (A) Flagella       (B) Cilia       (C) Embryo       (D) None of these

34. Which phylum of algae do not have forms with flagellated motile cells in at least one stage of their life cycle:  
(A) Phaeophyta (B) Rhodophyta (C) Chlorophyta (D) Euglenophyta
35. Which is member of Pyrrophyta?  
(A) Frequilaria (B) Fuscus (C) Gonyaulax (D) Ulva
36. Some algae are edible such as:  
(A) Mushrooms (B) Chlorella (C) Diatoms (D) Kelps
37. Marine algae are also source of many useful substances like:  
(A) Carrageenan (B) All of these (C) Agar (D) Algin
38. Oomycotes are close relatives of the:  
(A) Bacteria (B) Protozoa (C) Algae (D) Fungi
39. Which one has played infamous roles in human history as they were the cause of Irish potato famine of the 19<sup>th</sup> century ?  
(A) Trypanosoma gambiense (B) Entamoeba histolytica  
(C) Phytophthora infestans (D) Physarum polycephalum
40. During unfavourable conditions , slime mold forms , resistant haploid spores by meiosis within stalked structures called:  
(A) Asci (B) Basidia (C) Sporangia (D) Conidia
41. Plasmodium ( slime mold ) is a multinucleate mass of cytoplasm that can grow in diameter to:  
(A) 20 cm (B) 30 cm (C) 10 cm (D) 5 cm
42. Cell walls of Oomycotes contain:  
(A) Glycogen (B) Peptidoglycan (C) Cellulose (D) Chitin
43. Fungus - like protists have bodies formed of threadlike structures called:  
(A) Yarns (B) Twines (C) Hyphae (D) Fibres
44. The plasmodial slime mold that is a model organism is:  
(A) Ustilago tritici (B) Frequilaria  
(C) Physarum polycephalum (D) Phytophthora infestans
45. One or small diploid micronodei of ciliates function in:  
(A) Cuticle (B) Sheath (C) Sexual process (D) Pellicle
46. An outer flexible covering of ciliates is:  
(A) Sheath (B) Pellicle (C) Cuticle (D) Cell wall
47. Test of forminifera is made of:  
(A) Chitin (B) Calcium (C) Silica (D) Calcium phosphate
48. The sexual process is exhibited by most cilites by:  
(A) Binary fission (B) Conjugation (C) Budding (D) Fertilization
49. Mosquito Injects ..... into human body  
(A) Sporozoites (B) Gametocytes (C) Oocytes (D) Merozoites

50. The protozoans having two kinds of nuclei:

- (A) Actinopods      (B) Zooflagellates       (C) Ciliates      (D) Amoeba

51. Sleeping sickness is spread by:

- (A) Plasmodium      (B) Trypanosoma      (C) Mosquito       (D) Tsetse fly

52. Example of Apicomplexans is:

- (A) Amoeba      (B) Sentor       (C) Plasmodium      (D) Vorticella

53. What is not true for ciliates:

- (A) Do not ingest bacteria      (B) Maybe sessile  
 (C) Without nuclei      (D) Flexible outer covering, the pellicle

### Fill in the blanks

Q1: Whittaker's five kingdom system of classification recognizes two basic types of cells ..... and .....

Q2: In five kingdom system of classification proposed by Margulis and Schwartz organelles of symbiotic origin such as ..... and ..... were also considered.

Q3: A bacteriophage reproduces by using the metabolic machinery ..... and .....

Q4: The protein coat that encloses the viral genome is called ..... It is made up of .....

Q5: Retroviruses are ..... viruses which have specific enzymes ..... by which they convert RNA to DNA.

Q6: HIV infects ..... and the defects in these cells lead to failure in ..... system.

Q7: Hepatitis is caused by .....

Q8: The most common system of classification used today, developed in 1969 by Robert Whittaker of Cornell University, uses five kingdoms ..... and .....

### Answers

- |                                     |   |
|-------------------------------------|---|
| 1. Eukaryotes, Prokaryotes          | 2. Mitochondria, chloroplast                  |
| 3. DNA, cytoplasm                   | 4. Capsid, capsomers                          |
| 5. RNA tumor, reverse transcriptase | 6. T-lymphocyte, immune                       |
| 7. Viral infection                  | 8. Monera, protista, fungi, plantae, animalia |

Chapter : 07

The Kingdom Protista or Protoctista

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## Subjective

Q1: **Write characteristics of protists.**

Ans: The protists are unicellular, colonial or simple multicellular organisms that possess a eukaryotic cell organization. e.g., Algae, Protozoa.

Q2: **What are the major groups of eukaryotic organisms of kingdom protista?**

Ans: The kingdom protista contain four major groups i.e.

- Single cell protozoans.
- Unicellular algae.
- Multicellular algae.

- Slime molds and Oomycetes.

Q3: **Who proposed kingdom protista?**

Ans: John Hogg proposed kingdom protista for microscopic organisms.

Q4: **In which respects during course of evolutionary history, organisms in kingdom protists have evolved diversity?**

Ans: In kingdom protists have evolved diversity:

- Size and structure.
- Means of locomotion.
- Ways of obtaining nutrients.
- Modes of reproduction.
- Habitat.
- Interactions with other organisms.

Q5: **Write two characteristics of protozoans.**

Ans: Characteristics of Protozoans:

- All protozoans are unicellular.
- Most ingest their food by endocytosis.

Q6: **How zoo-flagellates obtain their food?**

Ans: They obtain food either by ingesting living or dead organisms e.g., Euglena, Amoeba or by decomposing organic matter. e.g., Slime Algae.

Q7: **What is the habitat of zoo-flagellates?**

Ans: Zooflagellates are free living, parasite, or symbionts.

Q8: **What is trypanosoma?**

Ans: Trypanosoma is a human parasite causing African sleeping sickness. It is transmitted by the bite of infected tsetse fly.

Q9: **What is the habitat of choanoflagellates?**

Ans: Choanoflagellates are sessile marine or freshwater flagellates which are attached by a stalk.

Q10: **Define pellicle.**

Ans: Pellicle is a flexible outer covering of ciliates that gives them definite but changeable shape.

Q11: **In which way cillates differ from other protozoans.**

Ans: Ciliates differ from other protozoans in having two kinds of nuclei large is meganucleus and small is micronucleus.

Q12: **From what tests of forminifera and of actinopods are made of?**

Ans: Tests of forminifera all made of calcium where as those of actinopode are made of silica.

Q13: **Write two characteristics of Apicomplexans.**

Ans: Characteristics of Apicomplexans:

- Apicomplexans are unicellular.
- They are non-motile.

Q14: **Write the name of apicomplexans that cause malaria.**

Ans: Plasmodium, the apicomplexans that cause malaria enters human body by the bite of infected female anopheles mosquito.

Q15: **What kind of body algae possessed?**

Ans: The plant body of algae is thallus i.e., not differentiated into true roots, stems and leaves and lack vascular bundles.

Q16: **Write two characteristics of dinoflagellates.**

Ans: Characteristics of dinoflagellates:

- Most dinoflagellates are unicellular.
- Their cells are often covered with shells of interlocking cellulose plates impregnated with silicates.

Q17: **What stage is called plasmodium in slime molds?**

Ans: The feeding stage of a slime mold is a multinucleate mass of cytoplasm that can grow to 30cm (1 foot) in diameter. This stage is called plasmodium.

Q18: **What are the similarities between fungus like protists and fungi?**

Ans: Some protists resemble fungi in that they are not photosynthetic and some have bodies formed of thread like structure called hyphae.

Q19: **What causes late blight of potatoes?**

Ans: Late blight of potatoes is caused by a water mold called phytophthora infestans.

Q20: **Why Euglena is placed in kingdom protists?**

Ans: They are placed in kingdom protista because they have chlorophyll and are photosynthetic but at the same time it had cell wall and is motile.

Q21: **What stage of malarial parasite causes chill and fever?**

Ans: The simultaneous bursting of red blood cells cause the symptoms of malaria, chill, followed by high fever.

Q22: **What is conjugation?**

Ans: Conjugation is a sexual process of ciliates during which two individuals come together and exchange genetic material.

Q23: **What is phylum of red algae?**

Ans: The phylum of red algae is Rhodophyta.

Q24: **Name the pigments present in diatoms.**

Ans: Chlorophyll a, chlorophyll c carotenoids and fucoxanthin are pigments present in diatoms.

Q25: **What cause red tides?**

Ans: Dinoflagellates are known to have occasional population explosions or blooms. These blooms color the water orange, red or brown and are called red tides.

Q26: **What are kelps?**

Ans: The largest brown algae, which are tough and leathery in appearance. Whose leaf like structure called blade, stem like called stipes and root like structure called hold fast.

Q27: **Do slime moulds have definite cellular organization?**

Ans: No, they do not have definite cellular organization.

Q28: **What is the cause of Irish potato?**

Ans: Phytophthora is the cause of Irish potato.

Q29: **Do red algae has flagellated cells?**

Ans: **No**, they does not have flagellated cells.

Q30: **What is the role of diatoms in ecosystem?**

Ans: They are major producers in the aquatic ecosystem because of their extremely large numbers.

Q31: **What is common in Eukaryotic Red algae and Blue Green algae?**

Ans: They do not have flagellated cells.

Q32: **What is sporangia?**

Ans: During unfavorable condition, slime mold forms resistant haploid spore by meiosis with in stalked structure called sporangia.

Q33: **Write two characteristics of slime molds.**

Ans: Characteristics of slime molds:

- The feeding stage of a slime mold is a multinucleate mass of cytoplasm.
- The plasmodium streams over damp, decaying logs and leaf litter. It often forms a network of channels that covers a large surface area.

Q34: **Write two differences between algae and plants.**

Ans: **Algae:**

- Sex organs are unicellular.
- The parent body does not protect the zygote.

**Plants:**

- A plant zygote grows into a multicellular embryo.
- Zygote is protected by parental tissue.

Q35: **Write two characteristics of Oomycotes.**

Ans: Characteristics of Oomycotes:

- Their cell walls contain cellulose, not chitin.
- Their hyphae are aseptate (without cross walls).

Q36: **How are protists important to humans? What is their ecological importance?**

Ans: Importance of Protists:

**Disease:**

- The intestinal parasite, Entamoeba Histolytica that causes amoebic dysentery, germinates from resistant cysts with the digestive tracts of their mammalian hosts including humans.
- Trypanosoma is a human parasite causing African sleeping sickness. It is transmitted by the bite of infected tsetse fly.
- Some Apicomplexans such as Plasmodium cause serious diseases such as malaria in humans.
- Phytophthora Infestans have played infamous 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. Because of several rainy, cool summers in Ireland in the 1840's, the water mold multiplied unchecked, causing potato tubers to rot in the fields. Since potatoes were the staple of Irish

peasant's diet, many people (250,000 to more than 1 million) starved to death. The famine prompted a mass migration out of Ireland to such countries as the United States.

### **Chalk Formation:**

- Dead foraminiferans sink to the bottom of the oceans where their shells form a grey mud that is gradually transformed into chalk. Foraminiferans of the past have created vast limestone deposits.

### **As Food:**

- Some algae such as kelps are edible and may be used to overcome shortage of food in the world.
- Larvae of some aquatic insects feed on aquatic protozoans. While these larvae are taken as food by clam, prawn and young fishes which are the ultimate source of food of man.

### **Useful Substances:**

- Marine algae are also source of much useful substance like algin, agar, carrageenan and antiseptics.

### **Produces:**

- Algae are major producers of the aquatic ecosystem, thus they play a basic role in food chains, providing food and oxygen to other organisms.
- Ecologically, diatoms and dinoflagellates are the most important groups of producers in marine ecosystem.

### **Symbiotic Organism:**

- Trichonymophas are complex, specialized flagellates with many flagella which lives as symbionts in the guts of termites and help in the digestion of dry wood.

### **Helpful in the Study of Biological Processes:**

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

### **Helpful in Sanitation:**

- Some protozoans play an important role in the sanitary betterment and improvement of the modern civilization in keeping water safe for drinking purpose. The protozoans living in polluted water feed upon waste organic substances and thus purify it. Some bacteria feed on the bacteria and purify the water indirectly.

### **Building Coral Reefs:**

- Some red algae incorporate calcium carbonate in their cell walls from the ocean and take part in building coral reefs along with coral animals.

Q37: **What are three major groups of protists?**

Ans: Major groups of protists:

- **Protozoa:** Animal-like protists.
- **Alga:** Plant-like protists.



- **Slime molds and Oomycotes:** Fungi-like protists.

Q38: **Give at least two examples of each group of protists.**

Ans: Examples of groups of protists:

- **Protozoa:** Plasmodium, Amoeba.
- **Algae:** Euglena, Spirogyra.
- **Slime molds and Oomycotes:** Phytophthora infestans, Physarum polycephalum.

Q39: **Green algae are considered ancestral organisms of green land plants. Discuss.**

Ans: 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.

Q40: **What features distinguish Oomycotes from Fungi?**

Ans: Features that distinguish Oomycotes from Fungi:

- They are regarded as more ancient group.
- Their cell walls contain cellulose, not chitin.

Chapter : 07

The Kingdom Protista or Protoctista

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Imp. Long Questions

- Q1: Discuss important features of protists. Why are protists so difficult to classify?
- Q2: How are protists important to humans? What is their ecological importance?
- Q3: Discuss general characteristics of algae.
- Q4: Green algae are considered ancestral organisms of green land plants. Discuss.
- Q5: What features distinguish Oomycotes from fungi?
- Q6: Describe structure and reproduction of slime molds.