

Class: XI
Subject: Biology
Topic: Biological classification
No. of Questions: 25

Q1. Discuss how classification systems have undergone several changes over a period of time?

Ans. Different systems of classification proposed from time to time have undergone several changes from artificial system to phylogenetic system. Earlier the system of classification was based on one or a few superficial resemblances. For example, animals were classified as aquatic (water dwellers), terrestrial (land dwellers) and aerial (air dwellers). Similarly, plants were classified as herbs, shrubs and trees on the basis of their habit. These systems are artificial. These systems were then followed by natural system which was based on a number of structural and morphological taxonomic characters. Now a day, the organisms are classified on the basis of their evolutionary interrelationship. Such classifications are phylogenetic.

Q2. State two economically important uses of :

- (a) heterotrophic bacteria
- (b) archebacteria.

Ans. A. Heterotrophic bacteria: These bacteria are natural scavengers because they decompose the organic matter. This activity is economically used in sewage disposal and in improving fertility of soil by formation of humus.

B. Archebacteria: These bacteria live as symbionts in the rumen of herbivorous animals that chew their cud (cow, buffalo) and help in fermentation of cellulose. These bacteria are used in the production of methane (biogas) from the dung.

Q3. What is the nature of cell-walls in diatoms?

Ans. The cell wall of diatoms is chiefly composed of cellulose impregnated with glass-like silica. It shows sculpturing and ornamentations. The cell wall is composed of two overlapping halves (or theca) that fit together like two parts of a soap box. The upper half is called epitheca and the lower half is called hypotheca.

Q4. Find out what do the terms 'algal bloom' and 'red tides' signify.

Ans. 'Algal bloom': When color of water changes due to profuse growth of colored phytoplankton, it is called algal bloom.

'Red tides: Redness of the red sea is due to luxuriant growth of *Trichodesmium erythrium*, a member of cyanobacteria (blue green algae).

Q5. How are viroids different from viruses?

Ans. Viroids are smaller than viruses which lack protein coat. On the other hand, the viruses have genetic material surrounded by protein coat.

Q6. Describe briefly the four major groups of protozoa.

Ans. The four major groups of protozoa are: 1. Zooflagellata 2. Sarcodina 3. Sporozoa 4. Ciliata

Q7. Plants are autotrophic. Can you think of some plants that are partially heterotrophic?

Ans. The insectivorous plants such as *Nepenthes* (Pitcher plant), *Utricularia* (Bladder wort) and Venus fly trap and some parasites such as *Cuscuta* are examples of partially heterotrophic plants.

Q8. What do the terms phycobiont and mycobiont signify?

Ans. Each lichen consists of two components – a fungus (mycobiont) and an alga (phycobiont). Thus mycobiont is fungal part of lichen whereas phycobiont is algal part.

Q9. Give a comparative account of the classes of kingdom Fungi under the following:

(i) Mode of nutrition

(ii) Mode of reproduction

Ans:

Classes of fungi	Mode of Nutrition	Mode of reproduction
Class. Oomycetes	Mostly aquatic and obligate parasites on plants.	Sexual reproduction results in the formation of Oospores.

Class. Zygomycetes	Mostly Saprophytes	Isogametes fuse to form zygospores.
Class. Ascomycetes	They are saprophytes, parasites or coprophilous (growing on dung)	Sexual spores are called Ascospores
Class. Basidiomycetes	They are Saprophytes or parasites.	Sexual spores are called Basidiospores.
Class. Deuteromycetes	Mostly are Saprophytes or parasites. Mostly parasites	Sexual reproduction not known

Q10. What are the characteristic features of Euglenoids?

Ans. Unicellular protists have been broadly divided into three major groups – A. photosynthetic protists (The protistan algae), B. Slime moulds (The consumer decomposer protists), and C. Protozoan protists.

A. Photosynthetic Protists (- The Protstan Algae)

Photosynthetic protists are mainly unicellular eukaryotic algae, called protistan algae. The term algae refers to several kinds of aquatic, simple, thalloid, photosynthetic organisms ranging from unicellular microscopic forms to giant sea weeds. They were all placed in single group-algae of plant-kingdom in two kingdom- system of classification. However, in modern five kingdom system of classification – (i) blue green algae (Cyanobacteria) are placed in kingdom-Monera, (ii) Green algae (including unicellular forms such as Chlamydomonas and Chlorella), Brown and Red-algae are placed in kingdom Plantae and (iii) The remaining unicellular algal groups such as dinoflagellates, diatoms and Euglenoids are placed in the kingdom-Protista.

Q11. Give a brief account of viruses with respect to their structure and nature of genetic material. Also name four common viral diseases.

Ans. Virus (L. poisonous fluid) is a group of ultramicroscopic, non-cellular, highly infectious agents that multiply only intracellular inside the living host cells without involving growth and division. Outside the host cells, they are inert particles. They are nucleoproteins having one or more nucleic acid molecule, either DNA or RNA, encased in a protective coat of protein or lipoprotein

Q12. Organize a on the topic – Are viruses living or non-living?

Ans. 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. The two views are listed below-

1. Viruses are non-living : The following characters state that they are non-living-
 - (i) Viruses have no complete cellular structure. They are not surrounded by cell membrane or cell wall.
 - (ii) They do not show cellular metabolism and lack respiration.
 - (iii) They possess high specific gravity unlike living organisms.
 - (iv) Viruses are active only when they are inside the living host cells. Outside the host, they are as good as chemical substances. Thus, they do not have their independent existence.
 - (v) Some viruses have been successfully crystallized like simple chemical substances. The crystallized forms retain their capacity of infection. This phenomenon has not been observed in any living organism.
 - (vi) The viruses can be precipitated just like chemical substances.
2. Viruses are living organisms : The following characters state that they are living organisms-
 - (i) They have definite shape and morphology like that of a living organism.
 - (ii) They possess genetic material (DNA or RNA), which determine their structure and development.
 - (iii) All viruses are intracellular obligate parasite and attack specific hosts. The bacteriophage recognize the real bacterial surface. The viruses produce characteristic symptoms on their particular host.
 - (iv) They show property of mutation.
 - (v) They show irritability and respond to environmental conditions such as heat, ultraviolet rays, humidity, drought, alcohol, etc.
 - (vi) They can grow inside the host and multiply enormously showing one of the most important properties of living organisms.

Q13. How ascomycetes are different from basidiomycetes ?

Ans. Differences between ascomycetes and basidiomycetes

Ascomycetes	Basidiomycetes
1. Mycelium consists of branched multicellular. Separate hyphae.	1. Mycelium may be primary, secondary or tertiary.
2. Septa are perforated by simple pore.	2. Septa are perforated by dolipore.

<p>3. The fruiting bodies are ascocarps.</p> <p>4. Sexual reproduction leads to the formation of ascus (pl. asci).</p> <p>5. Each ascus is a club-shaped structure that contains 8 ascospores.</p> <p>6. Ascospores are borne endogenously (inside the ascus).</p>	<p>3. The fruiting bodies are basidiocarps.</p> <p>4. Basidiomycetes are characterized by production of basidia (sig. basidium).</p> <p>5. Each basidium is a club-shaped structure that bears 4 basidiospores.</p> <p>6. Basidiospores are borne exogenously (attached outside the basidia).</p>
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Q14. Compare the different types of fruiting bodies in fungi.

Ans. The fruiting bodies are not formed in mastigomycotina and zygomycotina. The fruiting bodies of ascomycetes are ascocarps and those of basidiomycetes are basidiocarps. The ascocarps of the three types :

1. Apothecium : these are cup-shaped fruiting bodies. The asci are arranged in upper layer called hymenium example, Morchella.
2. Perithecium: it is flask-shaped fruiting body which has a definite apical pore called ostiole. Example, Claviceps.
3. Cleistothecium : it is a small spherical or ovoid indehiscent fruiting body which is completely closed from all the sides. Example, Erysiphe.

The basidiocarps of basidiomycetes differ in shape and size. The most common fruiting body of button mushroom has umbrella shaped pileus and stalk-like stipe.

Q15. (a) What are protozoans ? Give two examples each of free-living and parasitic forms.

(b) What are slime-moulds? How are they different from true fungi ? Give one example each of cellular and acellular slime moulds.

(c) Differentiate between ascus and basidium.

Ans. (a) protozoans are unicellular protist animas. Each protozoan is microscopic organism in which a single cell performs all the vital activities. Examples of free living protozoans are Amoeba and Paramecium. Example of parasitic forms is Trypanosoma and Plasmodium.

(b) Slime moulds are consumer decomposer protists which occur in the form of slimy masses during vegetative phase. The vegetative parts do not possess cell wall and, therefore, they occur either as free-living multinucleate amoeboid mass of protoplasm (plasmodium) or aggregation of amoebae (pseudoplasmodium). Example of cellular slim mould is Dictyostelium and that of acellular slime mould is Physarum.

(c) The main differences between an ascus and a basidium are –

(i) ascus is formed in ascomycetes whereas basidium is formed in basidiomycetes,

(ii) ascus encloses 8 ascospores which are borne endogenously. The basidium produces 4 basidiospores which are borne exogenously.

(iii) The basidiospores are attached to basidia by means of sterigma whereas ascospores are filled inside the sac like ascus.

Q16. What is the name of fully formed virus particle?

Ans. The name of fully formed virus particle is virion.

Q17. What is the chemical nature of capsid?

Ans. Chemically, the capsid is composed of protein.

Q18. Give one reason: why are viruses regarded as biological systems?

Ans. Viruses are regarded as biological system because they contain molecular information in the form of nucleic acid (either DNA or RNA), transcribed and replicated within the host cells.

Q19. Give one reason: why are viruses regarded as non-living particles?

Ans. Viruses are regarded as non-living particles because none of them has enzyme activity away from its host.

Q20. Name the virus which causes AIDS in human beings.

Ans. The causative agent of AIDS (acquired immune deficiency syndrome) in humans is HIV (Human immune deficiency virus)

Q21. Viruses that infect bacteria multiply and cause their lysis, are called

- a) Lipolytic
- b) Lytic
- c) Lysogenic
- d) Lysozymes

Ans: (b)

Q22. Among rust, smut and mushroom all the three

- a) Are pathogens
- b) Are saprobes
- c) Bear ascocarps
- d) Bear basidiocarps

Ans: (a)

Q23. Which is correct:

- a) Slime moulds are haploid
- b) Protozoan lack cell wall
- c) Dinoflagellates are immotiles
- d) Pellicle is absent in Euglena

Ans: (b)

Q24. Contagium vivum fluidum was proposed by

- a) D.J. Ivanowsky
- b) M.W. Beijerinck
- c) Stanley
- d) Robert Hook

Ans: (b)

Q25. Nuclear membrane is absent in

- a) Penicillium
- b) Agaricus
- c) Volvox
- d) Nostoc

Ans: (d)