

## Long Answer Type Questions

**Q.1. Describe the various salient features of Protista. Name the major groups of this kingdom.**

**OR**

**Write the distinguish features of kingdom Protista.**

**OR**

**Write the features of unicellular eukaryotic organisms.**

**Ans. Features of Protista:**

- (i) They are single celled colonial, filamentous eukaryotes.
- (ii) These grow in humid and moist environments.
- (iii) Some are photosynthetic but some are non- photosynthetic.
- (iv) Some forms are like animals whereas some are like plants.
- (v) They have membrane bound cell organelles.
- (vi) Examples are protozoa, slime moulds, Euglenoids, Chrysophytes protistan algae such as diatoms, dinoflagellates or phytoplanktons etc.
- (vii) The protozoan are unicellular (single celled) heterotrophs. *Euglena* is autotroph.
- (viii) Slime moulds are plant like or animal like.

Their somatic body is called plasmodium (acellular, multinucleate, mobile mass of protoplasm lacking the cell wall).

**The major groups of this kingdom are:**

- (a) Photosynthetic protist or protistan algae.
- (b) Consumer decomposer protists - Slime moulds.
- (c) Protozoan protists.

**Q. 2. Compare the salient features of Monera and Protista.**

**Ans.**

S. No.	Salient Features	Monera	Protista
(i)	Cell types	Prokaryotic Type	Eukaryotic type.
(ii)	Cell wall	Non-Cellulosic	Cellulosic
(iii)	Chloroplasts	Absent	Found in some <i>e. g., Euglena.</i>
(iv)	Body Organization	Cellular	Celluar

(v)	Mode of Nutrition	Autotrophic	Autotrophic and heterotrophic.
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**Q. 3. Classify bacteria on the basis of their shape.**

**Ans.** Bacteria are classified as given below:

**(i) Cocci :** They are oval or spherical in shape. When they occur singly, they are called *Micrococcus*; if in pairs *Diplococcus*; if in a chain, *Streptococcus*; and if occur in clusters, *Staphylococcus*.

**(ii) Bacilli:** They are rod-like, with or without flagella. Flagella may be present at one or both the ends or around cells. Bacteria may occur singly, *Bacillus*; or in pairs, *Diplobacillus* or may form filaments, *Streptobacillus*.

**(ii) Vibrio :** They are small and curved like commas. These are mostly motile.

**(iv) Spirillum :** These are twisted like a screw. They have flagella at one end or both the ends. Certain bacteria possess flagella for locomotion.

**Q. 4. Describe the major groups of Protista.**

**Ans.** The kingdom Protista includes unicellular, eukaryotic organisms. They include both Photosynthetic and non-photosynthetic forms. The kingdom Protista includes protistan algae, slime moulds and protozoans.

**(i) Protistan algae:** They are photosynthetic protists. They include dinoflagellates and diatoms.

**(a) Dinoflagellates:** These are golden brown biflagellated Photosynthetic protists. They possess cellulose wall in the form of distinct interlocking plates.

**(b) Diatoms:** They are group of golden brown Photosynthetic protists which are covered by two valved silicious wall called shell or frustule. They pile up at the bottom water reservoirs and form big heap called diatomite.

**(ii) Slime moulds :** Slime moulds are both plants and animals like. They are plant like in the production of spores, and animal like in the mode of nutrition and somatic organisation. It moves freely on the substratum and feeds on bacteria, fungal and algal spores and also absorb nutrients directly from the substratum.

**(iii) Protozoa :** These are microscopic unicellular organisms with varied shapes and forms. This may be free living, commensal or parasitic. They lack cell wall, but some possess proteinaceous flexible pellicle.

Locomotion occurs by pseudopodia, flagella or cilia. These reproduce asexually by binary fission. Some reproduce sexually by conjugation.

**Q. 5. Write Short notes on:**

**(i) Methanogens**

**(ii) Halophiles**

**(iii) Thermoacidophiles.**

**Ans. (i) Methanogens:** (1) The archaebacteria are strict anaerobes. Nutritionally they are "autotrophs" which obtain both energy and carbon from decomposition products. (2) They occur in marshy areas where they convert formic acid and carbon dioxide into methane. (3) This capability is commercially exploited in the production of methane and fuel gas inside gobar gas plants. e.g., *Methanobacterium*, *Methanococcus*.

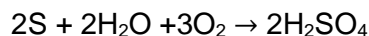
**(ii) Halophiles:** (1) Halophiles are named so because they usually occur in salt rich substrata like salt plant, and salt marshes e.g., *Halobacterium*, *Halococcus*. (2) They are aerobic chemoheterotrophs. Their cell membrane have red carotenoid pigment for protection against harmful solar radiations. (3) Halophiles are able to live under high salt conditions due to three reasons:

**(a)** Presence of special lipids in the cell membranes.

**(b)** Occurrence of mucilage covering.

**(c)** Absence of sap vacuoles and hence plasmolysis

**(iii) Thermoacidophiles :** (1) These archaebacteria have dual ability to tolerate high temperature as well as high acidity. (2) They often live in hot sulphur springs where the temperature may be as high as 80°C and pH as low as 2, e.g., *Thermoplasma thermoproteus*. (3) These archaebacteria are chemosynthetic. (4) Under aerobic conditions they usually oxidise sulphur to sulphuric acid.



Thermoacidophiles are able to tolerate high temperature and high acidity due to two reasons:

**(a)** Branched chain lipids in the cell membranes.

**(b)** Presence of special resistant enzymes capable of operating under acidic conditions.

#### **Q.6. Briefly describe the cell structure of blue-green algae.**

**Ans. (i)** Cyanobacteria or blue-green algae are gram(+) photosynthetic prokaryotes which perform oxygenic photosynthesis

**(ii)** Cell structure is typically prokaryotic-one envelope organisation with peptidoglycan wall naked DNA, 70S ribosomes, devoid of membrane bound cell organelles.

**(iii)** The outer part of the protoplast contains a number of photosynthetic thylakoids. It is called as chromoplasm.

**(iv)** Their membranes contain chlorophyll a, carotenes and xanthophylls. Chlorophyll b is absent.

**(v)** DNA lies coiled generally in central part of the cytoplasm known as centropiasm.

**(vi)** Small circular DNA segments may also occur in nucleoid, known as plasmid or transposons.

#### **Q. 7. What are the salient features of kingdom Fungi?**

**Ans. Kingdom Fungi :** The kingdom fungi, includes achlorophyllous, spore producing, multicellular, eukaryotic organisms .

**Salient features:**

- (i) The body of fungi is filamentous called mycelium. The filaments are known as hyphae.
- (ii) The hyphae are either multicellular or coenocytic *i.e.* multinucleate and without cross walls.
- (iii) The cell wall contain chitin and non-cellulosic polysaccharides N-acetyl - glucosamine.
- (iv) They have two envelop type of cellular organisation.
- (v) They are heterotrophic with absorptive type of nutrition. It is either saprobic or parasitic. Saprobiic fungi excrete digestive enzymes in the external medium to make complex organic matter soluble for absorption. Parasitic fungi absorb nourishment directly from another living organism called host.
- (vi) Reserve food is glycogen and fat.
- (vii) Reproduction is both asexual and sexual. Asexual reproduction takes place by spores like zoospores, conidia, ascospores and basidiospores. Sexual reproduction involves fusion of similar gametes. In some fungi, the fusion of two haploid (n) cells results in diploid (2n) cell or zygote.
- (viii) Many fungi act as decomposers and mineralisers and thus, play an important role in nutrient cycling in the biosphere.

**Q. 8.. Explain in detail the various methods of asexual reproduction in fungi.**

**Ans.** Special types of reproductive cells are formed in asexual reproduction in fungi. They are known as spores. Spores formed by mitosis are known as mitospores whereas some spores are produced after meiosis and they are called meiospores.

Many kinds of asexual spores are formed in fungi :

- (i) **Zoospores:** Zoospores are motile, *e. g.* Phycomycetes. They may have one or two flagella. On germination, zoospores produces new mycelium.
- (ii) **Sporangiospores:** They are non-flagellate spores that develop inside sporangia. They are usually dispersed by air currents, *e.g.*, *mucor*, *Rhizopus*.
- (iii) **Oidia :** Some oval or spherical spores are found in *Rhizopus*. They are formed by the small segment of hyphae under condition of excess water, sugar and salts.
- (iv) **Conidia:** Conidia are formed in some fungi as a means of asexual reproduction. They are born on conidiospores *e.g.* *Penicillium*.
- (v) **Chlamydospores:** Thick walled resting spores are produced in some fungi. They may be terminal or intercalary.

**Q.9. Give the salient features of kingdom Plantae.**

**Ans.** Kingdom Plantae contains all photosynthetic eukaryotic multicellular organisms and their non-photosynthetic relatives..

**The salient features of kingdom Plantae are:**

- (i)** Organisms are multicellular except for some algae.
- (ii)** They are eukaryotic.
- (iii)** Body form is less regular and Growth is usually indefinite.
- (iv)** Mode of nutrition is oxygenic photosynthesis.
- (v)** The photosynthetic regions contain chlorophyll.
- (vi)** The plants are usually fixed or free-floating.
- (vii)** Structural differentiation into tissues is found except for certain algae.
- (viii)** The cells contain central vacuoles.
- (ix)** Food reserve is usually starch and fat.
- (x)** Some of the plants are heterotrophic such as insectivorous plants.
- (xi)** Reproduction is both asexual and sexual. Accessory spores are present in lower plants.