02

Biological Classification

Introduction

Biological classification is the scientific method to classify the organism into different group on the basis of their similarity or dissimilarity -

Criteria for classification has been changed with time because knowledge regarding organism is increasing.

Aristotle was the earliest to attempt a more scientific basis for classification. He used simple morphological characters to classify plants into trees, shrubs and herbs.

Aristotle also divided animals into two groups, those which had red blood and those that did not.

System of Classification of Living Organisms

(i) Two kingdom classification :

- Given By **Carolus Linnaeus**
- Linnaeus gave two kingdom classification. He classified all organisms into two kingdoms - Kingdom plantae and kingdom Animalia.
- Kingdom plantae includes all plants while kingdom Animalia includes all animals.

Limitation of Two Kingdom Systems

This system did not distinguish between -
The eukaryotes and prokaryotes.
Unicellular and multicellular organisms.
photosynthetic (green algae) and non-photosynthetic (fungi) organisms.

(ii) Five kingdom classification :

- Given by **R. H. Whittaker (1969)**

R.H. whittaker (1969) proposed a five kingdom classification.

The main criteria used by him for making classification are :-

(i) Cell structure (Complexity of cell)

(ii) Thallus organisation (complexity of organism)/Body organization

(iii) Mode of nutrition

(iv) Reproduction

(v) Phylogenetic relationship

Five Kingdom

1. **Monera :** All the prokaryotes (Eubacteria, Rickettsia, Chlamydia, Actinomycetes, BGA, Archaebacteria, Mycoplasma)
2. **Protista :** All the unicellular eukaryotes (Dinoflagellates, Diatoms, Euglenoids. Slime moulds (false fungi) and Protozoans.
3. **Mycota (Fungi) :** True fungi
4. **Plantae :** All the multicellular plants - Algae, Bryophyta, Pteridophyta, Gymnosperm,Angiosperm
5. **Animalia :** All the multicellular animals

TABLE : - Characteristics of the Five Kingdoms

Characters	Five kingdoms				
	Monera	Protista	Fungi	Plantae	Animalia
Cell type	Prokaryotic	Eukaryotic	Eukaryotic	Eukaryotic	Eukaryotic
Cell wall	Non-cellulosic (Polysaccharide + amino acid)	Present in some	Present (without cellulose)	Present (cellulose)	Absent
Nuclear membrane	Absent	Present	Present	Present	Present
Body organisation	Cellular	Cellular	Multicellular/ loose tissue	Tissue/ organ	Tissue/organ/ organ system
Mode of nutrition	Autotrophic (chemosynthetic and photosynthetic) and Heterotrophic (saprophyte/ parasite)	Autotrophic (Photosynthetic) and Heterotrophic	Heterotrophic (Saprophyte/ Parasite)	Autotrophic (Photosynthetic)	Heterotrophic (Holozoic/ Saprophytic etc.)

Some Drawbacks of Earlier Classification Systems :

- It brought together the prokaryotic bacteria and the blue green algae with other groups which were eukaryotic.
- It grouped together the unicellular organisms and the multicellular ones, for example, *Chlamydomonas* and *Spirogyra* were placed together under algae.
- The classification did not differentiate between the heterotrophic group-fungi and the autotrophic green plants, though they also showed a characteristic difference in their walls composition- the fungi and chitin in their walls while the green plants had a cellulosic cell wall.
- All prokaryotic organisms were grouped together under kingdom Monera and the unicellular eukaryotic organisms were placed in kingdom protista.
- Kingdom protista has brought together *Chlamydomonas*, *Chlorella* (earlier placed in Algae within plants and both having cell walls) with *Paramaecium* and *Amoeba* (which were earlier placed in the animal kingdom which lack cell wall.
- An attempt has been made to evolve a classification system which reflects not only the morphological, physiological and reproductive similarities, but is also phylogenetic, i.e., is based on evolutionary relationships.

Kingdom Monera

Bacteria are the sole members of the Kingdom Monera. They are the most abundant micro-organisms.

Habitat :

Bacteria live in extreme habitats such as hot springs, deserts, snow and deep oceans where very few other life forms can survive.

Many of them live in or on other organisms as parasites.

Shape of Bacteria :

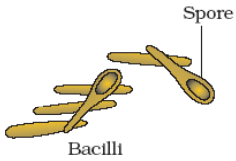
- Bacteria show large variations in their shape.
- On the basis of their shape bacteria are of different types.

1. Coccus/Cocci :

- These Bacteria are spherical
- These are smallest bacteria
- Maximum resistant bacteria

Example : *Streptococcus pneumoniae*

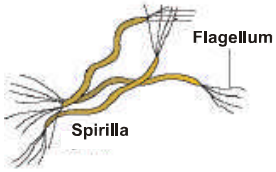
2. Bacillus/Bacilli :



- This group includes most of the bacteria
- These are rod shaped

Example : *E. coli, Bacillus anthracis.*

3. Spirillum/Spirilla :



- These are spiral shaped bacteria

Example : *Spirillum volutans, Treponema*

4. Comma/Vibrio :

- These are comma shaped bacteria

Example : *Vibrio cholerae*

Nutrition in Bacteria :

- The bacterial structure is very simple, they are very complex in behaviour.
- Bacteria as a group show the most extensive metabolic diversity.
- Some of the bacteria are autotrophic, i.e., they synthesise their own food from inorganic substrates.
- They may be photosynthetic autotrophic or chemosynthetic autotrophic.
- The vast majority of bacteria are heterotrophs, i.e., they depend on other organisms or on dead organic matter for food.

Archaebacteria

- These bacteria are live in some of the most harsh habitats such as extreme salty areas (halophiles), hot springs (thermoacidophiles) and marshy areas (methanogens).
- It differ from other bacteria in having a different cell wall structure and this feature is responsible for their survival in extreme conditions.
- Methanogens are present in the gut of several ruminant animals such as cows and buffaloes.
- Methanogens are responsible for the production of methane (biogas) from the dung of these animals.

Eubacteria

- They are characterised by the presence of a rigid cell wall, and if motile, a flagellum.
- The cyanobacteria (also referred to as blue-green algae) have chlorophyll a similar to green plants and are photosynthetic autotrophs.
- The cyanobacteria are unicellular, colonial or filamentous, fresh water/marine or terrestrial algae.
- The colonies are generally surrounded by gelatinous sheath.
- They often form blooms in polluted water bodies. Some of these organisms can fix atmospheric nitrogen in specialised cells called heterocysts, Example : *Nostoc* and *Anabaena*.

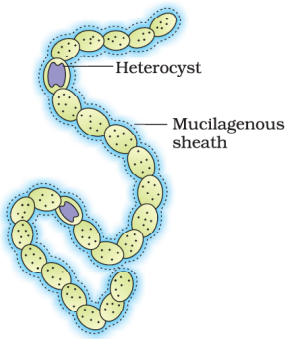


Figure - A filamentous blue-green algae – *Nostoc*

Nutrition in Eubacteria

Chemosynthetic autotrophic :

- These bacteria oxidise various inorganic substances such as nitrates, nitrites and ammonia and use the released energy for their ATP production.
- They play a great role in recycling nutrients like nitrogen, phosphorous, iron and sulphur.

Heterotrophic bacteria :

- These are most abundant in nature.
- The majority are important decomposers.
- Many of them have a significant impact on human affairs.
- They are helpful in making curd from milk, production of antibiotics, fixing nitrogen in legume roots, etc.

Disease caused by Eubacteria :

Cholera, typhoid, tetanus, citrus canker are well known diseases caused by different bacteria.

Reproduction in Eubacteria :

(i) **By Binary Fission :** It takes place during favourable conditions.

(ii) **By spore-formation :** It takes place in unfavourable conditions. spores are is thick walled and highly resistant.

(iii) **By sexual reproduction :** They also reproduce by a sort of sexual reproduction by adopting a primitive type DNA transfer from one bacterium to the other.

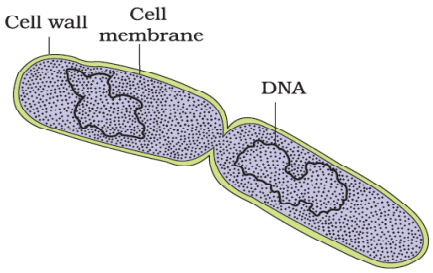


Figure- A dividing bacterium

Mycoplasma

- Mycoplasma are organisms that completely lack a cell wall.
- Mycoplasma are the smallest living cells known and can survive without oxygen.
- Many mycoplasma are pathogenic in animals and plants.

DPP-1

Q.1 Sexual reproduction by adapting primitive type of DNA transfer is found is
(1) Desmids (2) Bacteria
(3) Protozoans (4) Fungi

Q.2 In five kingdom classification unicellular eukaryotic organisms are included in :
(1) virus (2) protista
(3) fungi (4) monera

Q.3 Prokaryotic smallest cell is :-
(1) Mycoplasma (2) Cyanobacteria
(3) Bacteria (4) Bacillus

Q.4 Blue green algae belong to the kingdom
(1) Protista (2) Fungi
(3) monera (4) Plantae

Q.5 Which of the following are archaebacteria ?
(1) Green sulphur (2) Methanogens
(3) Pseudomonas (4) Chlamydias

Q.6 Organisms found in extremes temperatures are
(1) Cyanonacteria
(2) Archaebacteria
(3) Fungi
(4) Eubacteria

Q.7 Which of the following are not included in any of the kingdoms of Whittaker ?
(1) Bacteria
(2) Viruses
(3) Slime moulds
(4) Protozoan

Q.8 Five kingdom classification includes
(1) Monera, Protista, Fungi, Plantae, Animalia
(2) Algae, Fungi, Bryophyta, Pteridophyta, Gymnosperms
(3) Virus, Prokaryota, Fungi, Plantae, Animalia
(4) Monera, Protista, Animalia, Plantae, Algae

Q.9 Earliest scientific classification was given by Aristotle. Aristotle divided animals into two groups namely
(1) Protozoa and Monera
(2) Prokaryota and Eukaryota
(3) Those which had red blood and those that did not
(4) Autotrophic and Heterotrophic

Q.10 Which type of bacteria oxidise various inorganic substances such as nitrates nitrites and ammonia and use. the released energy for their ATP production ?
(1) Chemosynthetic autotrophic bacteria
(2) Photosynthetic autotrophic bacteria
(3) Archaebacteria
(4) Cyanobacteria

Q.11 Which of the following bacteria is responsible for recycling nutrients ?
(1) Archaebactcria
(2) Photosynthetic autotrophs
(3) Chemosynthetic autotrophs
(4) Chemosynthetic heterotrophs

Q.12 Cyanobacteria are also referred to as blue green algae because
(1) They do not produce gametes
(2) They fix atmospheric nitrogen
(3) They contains chlorophyll a
(4) They can live in harsh habitats

Q.13 Monerian, which devoid of cell wall is:
(1) Actinomycetes
(2) Mycoplasma
(3) Bacteria
(4) Cyanobacteria

Q.14 In comparison to many other organisms bacteria as a group show:
(1) Most extensive reproductive diversity
(2) Most extensive metabolic diversity
(3) Most suppressive metabolic diversity
(4) Most extensive dividing activity

Q.15 Eubacteria include
(1) blue-green algae and bacteria
(2) archaebacteria and blue-green algae
(3) cyanobacteria and eukaryotes
(4) bacteria and eukaryotes

Q.16 Specialised cells called heterocysts are present in
(1) dinoflagellates (2) chrysophytes
(3) archaebacteria (4) cyanobacteria

Q.17 *Nostoc* and *Anabaena* belong to
(1) parasitic bacteria (2) archaebacteria
(3) cyanobacteria (4) cocci bacteria

Kingdom Protista

- Kingdom Protista contains all single-celled eukaryotes.
- Members of Protista are primarily aquatic.
- This kingdom forms a link with the others dealing with plants, animals and fungi.
- Being eukaryotes, the protistan cell body contains a well defined nucleus and other membrane-bound organelles.
- Some have flagella or cilia.
- Protists reproduce asexually and sexually by a process involving cell fusion and zygote formation.
- Kingdom protista include Chrysophytes, Dinoflagellates, Euglenoids, Slime moulds and Protozoans.

1. CHRYSOPHYTES

- This group includes diatoms and golden algae (desmids).
- They are found in fresh water as well as in marine environment.
- They are microscopic and float passively in water currents (plankton).
- Most of them are photosynthetic.
- In diatoms the cell walls form two thin overlapping shells, which fit together as in a soap box.
- The walls of diatoms are embedded with silica and thus the walls are indestructible.
- Diatoms have left behind large amount of cell wall deposits in their habitat; this accumulation over billions of years is referred to as 'diatomaceous earth'.

Use of Diatomaceous earth :

- Stone polishing
- Filteration of oils and syrups
- Sound proofing
- Diatoms are the chief 'producers' in the oceans.

2. DINOFLAGELLATES

- Dinoflagellates are mostly marine and photosynthetic.
- Dinoflagellates appear yellow, green, brown, blue or red depending on the main pigments present in their cells.
- The cell wall has stiff cellulose plates on the outer surface.

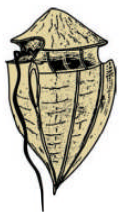


Figure : Dinoflagellates

- Most of Dinoflagellates have two flagella; one lies longitudinally and the other transversely in a furrow between the wall plates.
- Red Dinoflagellates (Example: Gonyaulax) undergo such rapid multiplication that they make the sea appear red (red tides).
- Toxins released by such large numbers may even kill other marine animals such as fishes.

3. EUGLENOIDS

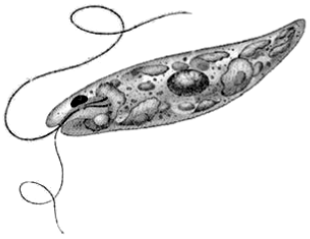


Figure : *Euglena*

- Majority of Euglenoids are fresh water organisms found in stagnant water.
- Instead of a cell wall, Euglenoids have a protein rich layer called pellicle which makes their body flexible.
- Euglenoids have two flagella, a short and a long one.
- Euglenoids are photosynthetic in the presence of sunlight, when deprived of sunlight they behave like heterotrophs by predating on other smaller organisms.
- The pigments of euglenoids are identical to present in higher plants. Example: *Euglena*

4. SLIME MOULDS

- Slime moulds are saprophytic protists.
- The body moves along decaying twigs and leaves engulfing organic material.
- Under suitable conditions, they form an aggregation called plasmodium which may grow and spread over several feet.

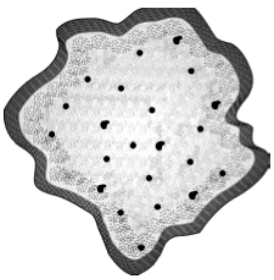


Figure : Slime mould

- During unfavourable conditions, the plasmodium differentiates and forms fruiting bodies bearing spores at their tips.
- The spores possess true walls.
- They are extremely resistant and survive for many years, even under adverse conditions. The spores are dispersed by air currents.

Protozoa

- All protozoans are heterotrophs and live as predators or parasites.
- They are believed to be primitive relatives of animals.
- There are four major groups of protozoans.

Classified into groups	Locomotory organelles	Features	Examples
Amoeboid protozoans	Pseudopodia	- These are found in fresh water or sea water or moist soil. They move and capture their prey by putting out pseudopodia. - Marine forms may have silica shells.	Amoeba (free living), Entamoeba (parasitic)
Flagellated protozoans	Flagella	- Free living (aquatic) or parasitic	Trypanosoma (Disease – African sleeping sickness)
Ciliated protozoans	Cilia	- Aquatic. - Numerous cilia are present over the body. - They have a cavity(gullet) that opens to the outside of the cell surface. - Food is drawn by the steering action of cilia present in gullet of cell.	*Paramecium*
Sporozoans	Absent	- These possess spore like infectious stage. - The most notorious is Plasmodium.	Plasmodium (Malarial parasite)

Ciliated protozoans :

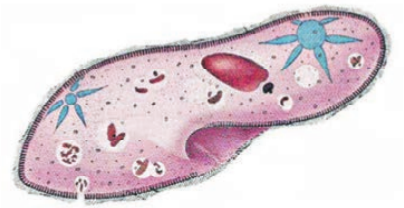


Figure : *Paramaecium*

DPP-2

Q.1 Members of group chrysophytes:-
(1) Are found only in fresh water
(2) Are the chief producers in the oceans
(3) Are microscopic and float actively in water current
(4) Are only parasitic

Q.2 Chrysophytes are:-
(1) Diatoms & Desmids
(2) Diatoms & Dinoflagellale
(3) Slime mould & Desmids
(4) Slime mould & Diatoms

Q.3 Red tide in oceans is caused by rapid multiplication of
(1) BGA (2) Rhodophyceae
(3) Diatoms (4) Dinoflagellate

Q.4 Though they are photosynthetic in the presence of sunlight, when deprived of sunlight they behave like heterotrophs predating on other smaller organisms. They are
(1) Slime moulds (2) Protozoans
(3) Chrysophytes (4) Euglenoids

Q.5 Members of Protista are primarily
(1) terrestrial (2) aquatic
(3) pathogenic (4) photosynthetic

Q.6 Select the incorrect statement w.r.t. diatoms.
(1) They folat actively in still water
(2) They are photosynthetic
(3) Their walls are embedded with silica
(4) They are found in both fresh water and marine environments

Q.7 Dinoflagellates have
(1) two flagella, which lie longitudinally
(2) only one flagellum in The transverse groove between the cell plates
(3) only one flagellum in the longitudinal groove between the cell plates
(4) one flagellum lies longitudinally and the other transversely in a furrow between the wall plates

Q.8 In which of the following groups, the cell wall has stiff cellulose plate on the outer surface?
(1) Diatoms (2) Red algae
(3) Dinoflagellates (4) Slime moulds

Q.9 Which of the following protists releases toxins that may even kill fishes and other marine animals?
(1) *Euglena* (2) *Gonyaulax*
(3) *Paramecium* (4) *Plasmodium*

Q.10 Under favourable conditions slime moulds form
(1) protonema
(2) plasmodium
(3) mycelium
(4) fruiting bodies

Q.11 Which of the following groups belong to protozoans?
(1) Amoeboid, flagellates, ciliates, sporozoans
(2) Diatoms, amoeboid, ciliates, sporozoans
(3) Desmids, ciliates, flagellates,amoebiod
(4) Dinoflagellates, ciliates, *Plasmodium*, amoeboid

Q.12 Which of the following is a flagellated protozoan ?
(1) *Amoeba*
(2) *Entamoeba*
(3) *Plasmodium*
(4) *Trypanosoma*

Kingdom fungi

- The fungi constitute a unique kingdom of heterotrophic organisms.
- Fungi show a great diversity in morphology and habitat.

Habitat :

- Fungi are cosmopolitan and occur in air, water, soil and on animals and plants.
- Fungi prefer to grow in warm and humid places.
- Fungi can be observed on moist bread and rotten fruits.

Characteristic features :

- Most fungi are heterotrophic and absorb soluble organic matter from dead substrates and hence are called saprophytes.
- Those that depend on living plants and animals are called parasites.
- They can also live as symbionts – in association with algae as lichens and with roots of higher plants as mycorrhiza.
- The cell walls of fungi are composed of chitin and polysaccharides.
- With the exception of yeasts which are unicellular, fungi are filamentous.
- Fungi bodies consist of long, slender thread-like structures called hyphae. The network of hyphae is known as mycelium.
- Some hyphae are continuous tubes filled with multinucleated cytoplasm – these are called coenocytic hyphae. Others have septae or cross walls in their hyphae.

Reproduction :

(1) Vegetative reproduction :

(a) Fragmentation : Some times the fungal filament (mycelium) breaks into small pieces due to some reason. Now these pieces form a new fungal filament and starts working like normal filament.

(b) Budding :
Example : *Saccharomyces* (Yeast)

(c) Fission :
Example : *Schizosaccharomyces* (Yeast)
Note : Reproduction through bud formation and fission takes place only in nonmycelial form.

(2) Asexual reproduction -

Asexual reproduction takes place by the formation of different types of spores.
These spores are formed by mitotic division.
Asexual reproduction is by spores called conidia or sporangiospores or zoospores.

Sexual Reproduction :–

Sexual reproduction is by oospores, ascospores and basidiospores.
The various spores are produced in distinct structures called fruiting bodies.

Sexual reproduction in fungi gets completed in three steps

(A) Plasmogamy : It is the fusion of protoplasm between two motile or non-motile gametes.
(B) Karyogamy : It is the fusion of two nuclei.
(C) Meiosis : Meiosis in zygote resulting in haploid spores.

Classification of fungi

Fungi are divided into four classes on the basis of :

- Morphology of the mycelium.
- Mode of spore formation.
- Fruiting bodies.

(i) Phycomycetes :

Habitat : Found in aquatic habitats, on decaying wood in moist and damp places or as obligate parasites on plants.

Mycelium : Aseptate and coenocytic

Asexual Reproduction : Zoospores (motile) or aplanospores (non-motile). These spores are endogenously produced in sporangium.

A zygospore is formed by fusion of two gametes. These gametes are similar in morphology (isogamous) or dissimilar (anisogamous or oogamous)

Figure : *Mucor*

Examples : *Mucor*

Rhizopus : The bread mould.

Albugo : The parasitic fungi on mustard.

(ii) Ascomycetes (Sac-fungi) :

They are mostly multicellular, Example, *Penicillium*, or rarely unicellular, Example, yeast (*Saccharomyces*)

Habitat : Saprophytic, decomposers, parasitic or coprophilous. (growing on dung.)

Mycelium : Branched and septate.

Asexual Reproduction : The asexual spores are conidia produced exogenously on the special mycelium called conidiophores.

Conidia on germination produce mycelium.

Sexual : Sexual spores are called ascospores which are produced endogenously in sac like asci (singular ascus).

These asci are arranged in different types of fruiting bodies called ascocarps.

Example : *Aspergillus*, *Neurospora, Claviceps* and members like morels and truffles.

Figure : *Aspergillus*

(iii) Basidiomycetes (Bracket fungi or Puffballs)

Habitat : Grow in soil, on logs and tree stumps and in living plant bodies as parasites. Example rusts and smuts.

Mycelium : Branched and septate.

Reproduction :

- The asexual spores are generally not found, but vegetative reproduction by fragmentation is common.
- The sex organs are absent, but plasmogamy is brought about by fusion of two vegetative or somatic cells of different strains or genotypes.
- The resultant structure is dikaryotic which ultimately gives rise to basidium.
- Karyogamy and meiosis take place in the basidium producing four basidiospores.
- The basidiospores are exogenously produced on the basidium.
- The basidia are arranged in fruiting bodies called basidiocarps.

Examples : *Agaricus* (mushroom), *Ustilago* (smut), *Puccinia* (rust fungus).

Figure : *Agaricus*

(iv) Deuteromycetes (Imperfect fungi) :

Commonly known as imperfect fungi because only the asexual or vegetative phases of these fungi are known.

Once perfect (sexual) stages of members of dueteromycetes were discovered they were often moved to ascomycetes and basidiomycetes.

Habitat : Mostly decomposers, some are saprophytes or parasites.

Mycelium : Branched and septate.

Reproduction : Reproduce only by asexual spores known as conidia.

Examples : *Alternaria*, *Colletotrichum* and *Trichoderma*.

Importance of Fungi :

- Some unicellular fungi, e.g., yeast are used to make bread and beer.
- Some are the source of antibiotics, e.g., Penicillium
- *Neurospora* (Ascomycetes) is used extensively in biochemical and genetic work.

- Many members of class ascomycetes like morels and truffles are edible and are considered delicacies.
- A large number of deuteromycetes are decomposers of litter and help in mineral cycling.

Harmful activities of Fungi :

- White spots seen on mustard leaves are due to a parasitic fungus.
- Fungal infections spoil fruits and the food stored in refrigerators.
- Other fungi cause diseases in plants and animals; wheat rust-causing *Puccinia*.

Kingdom Plantae

- All eukaryotic chlorophyll containing organisms commonly called plants are included under kingdom plantae.
- Few of them are partially heterotrophic such as insectivorous plants (e.g. Bladderwort and Venus Fly trap) or parasites (e.g. *Cuscuta*).
- The plant cells have an eukaryotic strucutre with prominent chloroplasts and cell wall which is mainly made up of cellulose.
- Kingdom Plantae includes algae, bryophytes, pteridophytes, gymnosperms and angiosperms.
- In plants, life cycle has two distinct phases i.e. the dipoloid sporophytic and haploid gametophytic that alternate with each other. This phenomenon is called **alternation of generation**.

Kingdom Animalia

- Kingdom animalia is characterised by heterotrophic eukaryotic organisms that are multicellular and their cells lack cell walls.
- They directly or indirectly depend on plants (autotrophs) for nutrition.
- In these members, the digestion of food takes place in an internal cavity and they store their food reserves in the form of glycogen or fat.
- Their mode of nutrition is holozoic by ingestion of food. They follow a definite growth pattern and grow into adults that have a definite shape and size.
- Most of them are capable of locomotion.

Higher forms of kingdom animalia show elaborate sensory and neuromotor mechanism.

The sexual reproduction is by copulation of male and female followed by embryological development.

DPP-3

Q.1 *Neurospora*, which is popularly known as *Drosophilla* of plant kingdom, belongs to :-
(1) Phycomycetes (2) Ascomycetes
(3) Basidiomycetes (4) Deuteromycetes

Q.2 Fungi that absorb soluble organic matter from dead substrates are called
(1) saprophytes (2) parasites
(3) obligate parasite (4) lichens

Q.3 Mycorrhizae are mutualistic and symbiotic associations between
(1) fungi and vascular plants
(2) fungi and non-vascular plants
(3) fungi and roots of higher plants
(4) fungi and bryophytes

Q.4 Fungi show vegetative reproduction by all of the following methods except
(1) by fragmentation (2) by fission
(3) by budding (4) by protonema

Q.5 Fungi show asexual reproduction by all of the following kinds of spores except
(1) conidia (2) oospores
(3) sporangiospores (4) zoospores

Q.6 In fungi, the various types of spores are produced in distinct structures known as
(1) fruiting body (2) spore sac
(3) peristome (4) pollen sac

Q.7 in fungi, the fusion of protoplasms between two motile or non-motile gametes is called
(1) plasmogamy (2) plasmokinesis
(3) karyogamy (4) cytokinesis

Q.8 In fungi, karyogamy is the fusion of two
(1) gametes, (2) nuclei
(3) cells (4) cytoplasm

Q.9 Ascomycetes are commonly known as
(1) toad stool (2) sac fungi
(3) imperfect fungi (4) bracket fungi

Q.10 Yeast and *Penicillium* are the examples of class
(1) Phycomycetes (2) Ascomycetes
(3) Deuteromycetes (4) Basidiomycetes

Q.11 In Basidiomycetes, the mycelium is
(1) branched and aseptate
(2) branched and septate
(3) unbranched and septate
(4) coenocytic

Q.12 All of the following fungi belong to Basidiomycetes, except
(1) *Agaricus*
(2) *Ustilago*
(3) *Puccinia*
(4) *Alernaria*

Q.13 Sexual reproduction is present in all fungi classes, except
(1) Ascomycetes
(2) Phycomycetes
(3) Basidioraycetes
(4) Deuteromycetes

Q.14 Members regarded as 'fungi imperfecti' are related to all of the following characteristics, except
(1) Deconposition of litter
(2) Formation of conidia
(3) Aseptate and branched mycelium
(4) Help in mineral recycling

Q.15 Which one of the following characteres is not a criterion for the classification of fungi?
(1) Morphology of mycelium
(2) Type of asexual spore
(3) Fruiting bodies
(4) Cell wall composition

Virus

- The viruses are non-cellular organisms that are characterized by having an inert crystalline structure outside the living cell. Once they infect a cell they take over the machinery of the host cell to replicate themselves killing the host.
- **Dmitri Ivanowsky(1892)** : Ivanowsky recognised certain microbes as causal organism of the mosaic disease of tobacco.
- These were found to be smaller than bacteria because they passed through bacteria-proof filters.

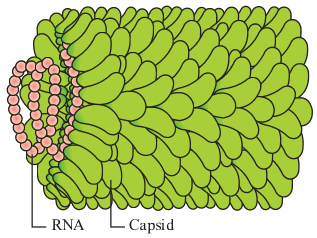


Figure : Tobacco Mosaic Virus (TMV)

- **M. W. Beijierinek (1898) :** He demonstrated that the extract of the infected plants of tobacco could cause infection in healthy plants and called the fluid as *Contagium vivum fluidum* (infectious living fluid).
- **W.M. Stanley (1935) :** He showed that viruses could be crystallized and crystals consist largely of proteins.
- They are inert outside their specilic host cell. Viruses are obligate parasites.
- In addition to proteins, viruses also contain genetic material that could be either RNA or DNA.
- No virus contains both RNA and DNA.
- A virus is a nucleoprotein and the genetic material is infectious.
- In general, viruses that infect plants have single stranded RNA and viruses that infect animals have either single or double stranded RNA or double stranded DNA.
- Bacterial viruses or bacteriophage (viruses that infect the bacteria) are usually double stranded DNA viruses.
- The protein coat called capsid made of small subunits called capsomeres protects the nucleic acid.
- These capsomeres are arranged in helical or polyhedral geometric forms.
- Viruses cause diseases like mumps, small pox, herpes, measles, polio, swine flu, common cold, yellow fever and influenza.
- AIDS in humans is also caused by a virus.
- In plants, the symptoms can be mosaic formation, leaf rolling and curling, yellowing and vein clearing, dwarfing and stunted growth.

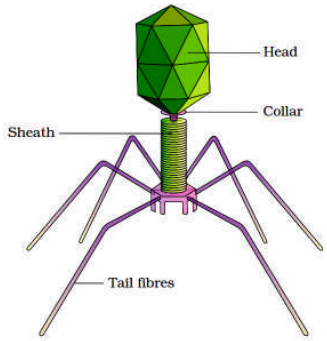


Figure : Bacteriophage

Viroids

- In 1971, T.O. Diener discovered a new infectious agent that was smaller than viruses and caused potato spindle tuber disease.
- It was found to be a free RNA.
- It lacks the protein coat that is found in viruses, hence the name viroid.
- The RNA of the viroid was of low molecular weight.

Prions

- In modern medicine certain infections neurological diseases were found to be transmitted by an agent consisted of abnormally folded protein.
- The agent was similar in size to viruses. These agents were called prions.
- The most notable diseases caused by prions are bovine spongiform encephalopathy (BSE) commonly called mad cow disease in cattle and its analogous variant Cr–Jacob disease (CJD) in humans.

Lichens

- Lichens are symbiotic associations, i.e., mutually useful associations, between algae and fungi.
- The algal component is known as phycobiont (Chlorophyceae) and fungal component as mycobiont (Ascomycetes), which are autotrophic and heterotrophic, respectively.
- Algae prepare food for fungi and fungi provide shelter and absorb mineral nutrients and water for its partner.
- Lichens are very good pollution indicators they do not grow in polluted areas as sensitive to sulphur dioxide.

DPP-4

Q.1 Potato spindle tuber disease is caused by :
(1) Viroid (2) Virus (3) Bacteria (4) Fungi

Q.2 Which of the following phenomenon proves that viruses are living?
(1) They carry metabolic activity
(2) They carry anaerobic respiration
(3) They multiply in host cells
(4) They cause infection

Q.3 The protein coat of a virus is known as
(1) nucleoid (2) capsid
(3) capsomere (4) outer envelope

Q.4 Viruses are also known as
(1) nucleoprotein particles (2) virion
(3) lipoprotein particles (4) core

Q.5 Which of the following groups of diseases is caused by viruses?
(1) Mumps, smallpox, herpes, influenza
(2) AIDS, diabetes, herpes, tuberculosis
(3) Anthrax, cholera, tetanus, tuberculosis
(4) Cholera, tetanus, smallpox, influenza

Q.6 Bacteriophages are
(1) bacteria that attack viruses
(2) viruses that attack bacteria
(3) free-living viruses
(4) free-living bacteria

Q.7 A new infectious agent that is smaller than virus is
(1) prion (2) viroid
(3) bacteria (4) mycoplasma

Q.8 Lichens are mutualistic and symbiotic associations between
(1) mycobiont and virus
(2) mycobiont and phycobiont
(3) mycobiont and root of higher plants
(4) mycobiont and mosses

Q.9 The benefit given by algae in lichen is
(1) food for fungi
(2) shelter
(3) mineral absorption
(4) protection

Q.10 Genetic material of bacteriophage is
(1) Double stranded DNA
(2) Single stranded RNA
(3) Double stranded RNA
(4) Single stranded DNA

Q.11 Which of the given statements is not true for viruses?
(1) They are nucleoproteins where protein is infections in nature
(2) They can be crystallised and crystals consist largely of proteins
(3) Virus means venom or poisonous fluid
(4) A virus can never have both DNA and RNA as its genetic material

Q.12 The concept of *Contagium vivum fluidum* (infectious living fluid) for virus was given -
(1) Mayer (2) Beijerinck
(3) Pasteur (4) Ivanowsky

Q.13 In general plant viruses have-
(1) Single strand RNA (2) dsRNA
(3) ssDNA (4) dsRNS

Q.14 The genetic material for most of the bacteriophages is-
(1) ssRNA (2) dsRNA
(3) dsDNA (4) ssDNA

Q.15 Viroids have
(1) Single stranded RNA not enclosed by protein coat
(2) Single stranded DNA not enclosed by protein coat
(3) Double stranded DNA enclosed by protein coat
(4) Double stranded RNA enclosed by protein coat

CLASS ASSIGNMENT

Q.1 In Whittaker's five kingdom classification, eukaryotes were assigned to :-
(1) All the five kingdom
(2) Only four of the five kingdoms
(3) Only three kingdom
(4) Only one kingdom

Q.2 Harmful activity of Blue green algae is :-
(1) Denitrification
(2) Water - bloom
(3) Increase alkalinity of soil
(4) Decrease fertility of soil

Q.3 Mycoplasmas
(1) lack cell wall
(2) have a cell wall
(3) are sensitive to penicillin
(4) are usually as big as most other bacteria.

Q.4 Taxonomically the most controversial group is
(1) Dinoflagellates (2) Diatoms
(3) Euglenoids (4) Prokaryote

Q.5 'Red tides' are produced by -
(1) Red algae (2) Dinoflagellates
(3) Diatoms (4) Brown algae

Q.6 The sac fungi belongs to :-
(1) Ascomycetes (2) Basidiomycetes
(3) Phycomycetes (4) Deuteromycetes

Q.7 Sexual cycle is absent in :-
(1) Phycomycetes (2) Deuteromycetes
(3) Ascomycetes (4) Basidiomycetes

Q.8 Lichens show symbiotic relationship between
(1) Algae and fungi
(2) Algae and bacteria
(3) Fungi and bacteriophage
(4) Algae and bacteriophage

Q.9 Study the following table and identify A, B, C and D.

Characters	Monera	Protista	Fungi	Plantae	Animalia
Cell type	Prokaryotic	A	Eukaryotic	Eukaryotic	Eukaryotic
Cell wall	Present	Present in some	B	Present	Absent
Nuclear Membrane	Absent	Present	Present	C	Present
Body organisation	Cellular	Cellular	D	Tissue/ organ	Tissue/ organ/organ systm

	A	B	C	D
(1)	Prokaryotic	Absent	Absent	Unicellular
(2)	Prokaryotic	Present	Present	Multicellular
(3)	Eukaryotic	Present	Present	Multicellular
(4)	Eukaryotic	Absent	Absent	Unicellular

Q.10 Select the incorrect statement.
(1) *Nostoc* and *Anabaena* have heterocysts for nitrogen fixation
(2) Cyanobacteria often form blooms in polluted water bodies
(3) Heterotrophic bacteria are more abundant in nature
(4) The cell wall of Mycoplasma are made up of chitin

Q.11 Choose the wrong statements regarding bacterial cell.
A. Glycocalyx is the outer most envelope in bacteria.
B. The glycocalyx could be a loose sheath called capsule.
C. The glycocalyx may be thick and tough called slime layer.
D. A special structure formed by the plasma membrane is called mesosome.
E. Small bristle like fibres sprouting out of the cell are called fimbriae.
(1) A and C are wrong. (2) A and B are wrong.
(3) B and C are wrong. (4) C and D are wrong.

Q.12 Which of the following is correct?
(1) In all slime moulds spores doesn't posses true wall
(2) Protozoans are believe to be primitive relative of animal
(3) Dinoflagellates are non-motile
(4) Pellicle is absent in Euglena

Q.13 Which of the following is not a character of protista?
(1) Protists are prokaryotic.
(2) Some protists have cell walls
(3) Mode of nutrition is both autotrophic and heterotrophic.
(4) Body organization is cellular.

Q.14 Select the incorrect match.

Class		Member
(1) Phycomycetes	–	*Albugo*
(2) Basidiomycetes	–	*Claviceps*
(3) Ascomycetes	–	*Penicillium*
(4) Deuteromycetes	–	*Trichoderma*

Q.15 Match column I with column II and select the correct option.

Column I (Kingdom)	Column II (Class)
A. Morels	1. Deuteromycetes
B. Smut	2. Ascomycetes
C. Bread mould	3. Basidiomycetes
D. Imperfect fungi	4. Zygomycetes

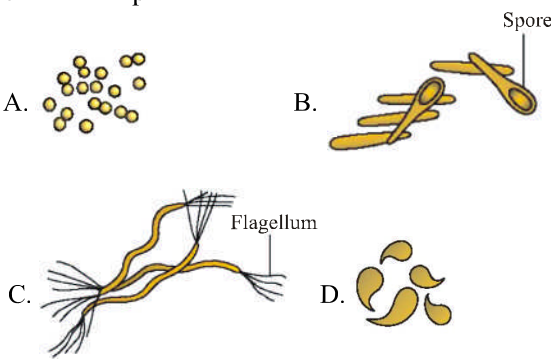
(1) A - 3, B - 4, C - 1, D - 2 (2) A - 2, B - 3, C - 4, D - 1
(3) A - 2, B - 1, C - 4, D - 3 (4) A - 3, B - 4, C- 2, D - 1

Q.16 Which of the following statement is incorrect about viruses?
(1) Viruses contain either RNA or DNA
(2) Viruses do not have their own metabolic system
(3) Bacteriophages are usually double stranded DNA viruses
(4) TMV contains both RNA and DNA as its genetic material

Q.17 Two kingdom classification was first proposed by :
(1) Aristotle (2) Carolus Linnaeus
(3) Bentham and Hooker (4) R.H. Whittaker.

Q.18 _____bacteria oxidise various inorganic substances such as nitrates, nitrites and ammonia and use the released energy for ATP production. They play an important role in recycling of nutrients (N, P, Fe, S etc.).
(1) Photosynthetic autotrophic
(2) Chemosynthetic autotrophic
(3) Parasitic
(4) Saprophytic

Q.19 Four types of bacteria (A to D) are identified on the basis of shape.

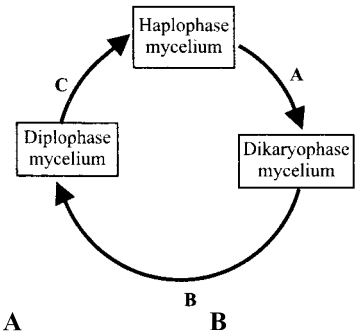


Which of the following is true?
(1) A = Vibrio, C = Cocci
(2) D = Cocci, B = Bacillus
(3) A = Cocci, D = Spirillum
(4) B = Bacillus, C = Spirillum.

Q.20 Which of the following statements about Euglena is correct?
(1) Euglena is a flagellate organism.
(2) Euglena when placed in continuous darkness, loses its photosynthetic activity and dies.
(3) The pigments of Euglena are quite different from those of green plants.
(4) Euglena is a marine protist.

Q.21 Malarial parasite is a member of :
(1) Eubacteria (2) Sporozoa
(3) Euglenoids (4) Slime molds.

Q.22 Given is the representation of life cycle of members of classes Ascomycetes and Basidiomycetes. Select the correct option for processes A, B and C.



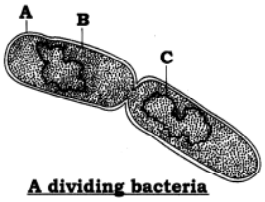
	A	B	C
(1)	Karyogamy	Plasmogamy	Meiosis
(2)	Plasmogamy	Karyogamy	Meiosis
(3)	Plasmogamy	Meiosis	Karyogamy
(4)	Karyogamy	Meiosis	Plasmogamy

Q.23 Which of the following statements is not correct regarding the Class Ascomycetes) ?
(1) Conidia are the asexual spores produced endogenously on conidiophores.
(2) Ascospores are the sexual spores produced endogenously in asci.
(3) Aspergillus, Neurospora and Claviceps are Ascomycetes fungi.
(4) Mycelium is generally branched and septate in Ascomycetes.

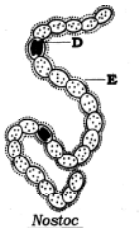
Q.24 Read the given statements that describe certain infectious particle.
(i) It was discovered by T.O. Diener and was found to be smaller than viruses.
(ii) It causes potato spindle tuber disease.
(iii) It is a free RNA particle which lacks the protein coat.
(iv) It has low molecular weight RNA as genetic material.
Which of the following is referred to here?
(1) Virus (2) Viroid
(3) Virion (4) Bacteriophage

Q.25 **Assertion :** The two kingdom classification, used for a long time, was found to be inadequate.
Reason : Two kingdom system of classification did not distinguish between the eukaryotes and prokaryotes, unicellular and multicellular organisms and green algae and fungi.
(1) If both assertion and reason are true and reason is the correct explanation of assertion.
(2) If both assertion and reason are true but reason is not the correct explanation of assertion.
(3) If assertion is true but reason is false.
(4) If assertion is false but reason is true.

Q.26 Identify the blanks in the following figures -



A dividing bacteria



Nostoc

(1) A - Cell wall, B - Cell membrane, C - Heterocyst, D - DNA, E - Mucilagenous sheath
(2) A - Cell wall, B - Cell membrane, C - DNA, D - Heterocyst, E - Mucilagenous sheath
(3) A-Mucilagenous sheath, B - Cell membrane, C - DNA, D - Heterocyst, E - Cell wall
(4) A-Cell membrane, B - Cell wall, C - DNA, D - Heterocyst, E - Mucilagenous sheath

Q.27 **Assertion:** Bacteria are the sole members of kingdom monera.
Reason: Bacteria have eukaryotic cellular/organization.
(1) If both assertion and reason are true and reason is the correct explanation of assertion.
(2) If both assertion and reason are true but reason is not the correct explanation of assertion.
(3) If assertion is true but reason is false.
(4) If assertion is false but reason is true.

Q.28 Match column I with column II and select the correct option from the codes given below.

	Column-I (Types)		Column-II (Examples)
A.	Amoeboid protozoans	1	*Plasmodium*
B.	Flagellated protozoans	2	*Paramecium*
C.	Ciliated protozoans	3	*Trypanosoma*
D.	Sporozoans	4	*Entamoeba histolytica*

Codes;

	A	B	C	D
(1)	1	2	3	4
(2)	4	3	2	1
(3)	3	2	1	4
(4)	2	1	4	3

Q.29 Read the following statements and select the correct option.
Statement -I: In diatoms the cell walls form two thin overlapping shells which fit together as in a soap box.
Statement-II: The cell walls of diatoms are embedded with silica and thus the walls are destructible.
(1) Both Statement-I and Statement-II are correct.
(2) Statement-I is correct but Statement-II is incorrect.
(3) Statement-I is incorrect but Statement-II is correct.
(4) Both Statement-I and Statement-II are incorrect.

Q.30 Match column I with column II and select the correct option from the codes given below.

	Column I (Features)		Column II (Related to)
A.	Parasitic fungi on mustard	1.	*Neurospora*
B.	Rust and smut disease	2	*Puccinia* and *Ustilago*
C.	Used in genetic work	3	Morels and truffles
D.	Edible delicacies	4	*Albugo*
E.	Bread mould	5	*Rhizopus*

Codes;

	A	B	C	D	E
(1)	3	5	4	2	1
(2)	1	3	5	4	2
(3)	2	1	3	5	4
(4)	4	2	1	3	5

Q.31 **Statement I :** *Mucor, Rhizopus* and *Albugo* fungi are members of ascomycetes.
Statement II : The mycelium is aseptate and coenocytic and sexual reproduction tapes place by zoospores or by aplanospores.
(1) Both Statement-I and Statement-II are correct.
(2) Statement-I is correct but Statement-II is incorrect.
(3) Statement-I is incorrect but Statement-II is correct.
(4) Both Statement-I and Statement-II are incorrect.

Q.32 Match column I with column II and select the correct option from the codes given below.

(a) Potato spindle	(i) Virus
(b) Cr-Jacob disease (CJD)	(ii) Viroid
(c) Cholera	(iii) Prion
(d) Leaf rolling and curling	(iv) Bacteria

(1) a - i, b - ii, c - iii, d - iv (2) a - iv, b - iii, c - ii, d - i
(3) a - ii, b - iii, c - iv, d - i (4) a - iv, b - i, c - iii, d - ii

Q.33 According to R.H. Whittaker, Euglena and Chlorella are placed in which kingdom ?
(1) Fungi (2) Monera (3) Protista (4) Plantae

Q.34 Archaebacteria differ from eubacteria in:
(1) Cell membrane structure
(2) Mode of nutrition
(3) Cell shape
(4) Mode of reproduction

Q.35 Pick up the wrong statement :
(1) Some fungi are edible
(2) Nuclear membrane is present in Monera
(3) Cell wall is absent in Animalia
(4) Protists have photosynthetic and heterotrophic modes of nutrition.

Q.36 Which of the following organisms are known as chief producers in the oceans?
(1) Cyanobacteria (2) Diatoms
(3) Dinoflagellates (4) Euglenoids

Q.37 Select the wrong statement :
(1) The walls of diatoms are easily destructible
(2) 'Diatomaceous earth' is formed by the cell walls of diatoms.
(3) Diatoms are chief producers in the oceans.
(4) Diatoms are microscopic and float passively in water.

Q.38 Which one of the following is wrong for fungi ?
(1) They are eukaryotic
(2) All fungi possess a purely cellulosic cell wall
(3) They are heterotrophic
(4) They are both unicellular and multicellular

Q.39 After karyogamy followed by meiosis, spores are produced exogenously in
(1) Agaricus (2) Alternaria
(3) Neurospora (4) Saccharomyces

Q.40 Viroids differ from viruses in having
(1) DNA molecules without protein coat.
(2) RNA molecules with protein coat.
(3) RNA molecules without protein coat.
(4) DNA molecules with protein coat.

HOME ASSIGNMENT

Q.1 Which one of the following is not the basis of five kingdom classification?
(1) Cell structure (2) Body organisation
(3) Reproduction (4) Reserve food material

Q.2 Which organisms are not included in the five kingdom system of classification?
(1) Protozoans (2) Viruses
(3) Lichens (4) Both (2) & (3)

Q.3 Heterotrophic, eukaryotic, multicellular organisms lacking a cell wall are included in the kingdom.
(1) Protista (2) Fungi
(3) Plantae (4) Animalia

Q.4 According to Whittaker, BGA are included in
(1) Mycota (2) Protista
(3) Plantae (4) Monera

Q.5 Kingdom Monera comprises the :-
(1) Plants of economic importance
(2) All the plants studied in botany
(3) Prokaryotic organisms
(4) Plants of Thallophyta group

Q.6 Whittaker is famous for :-
(1) Two kingdom classification
(2) Four kingdom classification
(3) Five kingdom classification
(4) Distinguishing in Bacteria & blue green Algae

Q.7 The group "Plantae" proposed by Whittaker includes :-
(1) Pteridophytes (2) Gymnosperms
(3) Angiosperms (4) All the above

Q.8 According to Whittaker kingdom protista includes :-
(1) Prokaryotes
(2) Unicellular eukaryotes
(3) Slime molds & protozoa
(4) Multicellular & eukaryotes

Q.9 During favourable conditions bacteria mainly reproduce by
(1) Budding (2) Fragmentation
(3) Sporulation (4) Fission

Q.10 Mark the odd one w.r.t. bacteria.
(1) Halophiles (2) Methanogens
(3) Thermoacidophiles (4) Cyanobacteria

Q.11 Primitive bacteria living in salty areas are called as
(1) Methanogens (2) Thermoacidophiles
(3) Heliophytes (4) Halophiles

Q.12 Infoldings of plasma membrane in bacteria are called as :-
(l) Episomes (2) Plasmid
(3) Pili (4) Mesosomes

Q.13 Heterocyst is a structure which is associated with
(1) Reproduction (2) Respiration
(3) Nitrogen fixation (4) Locomotion

Q.14 The function of mesosome in prokaryotes is :-
(1) Aerobic respiration (2) Cell wall formation
(3) Both (1) and (2) (4) N_2 - fixation

Q.15 During the rainy season ground surface become slippery due to :-
(1) Fungi (2) Blue green algae
(3) Bryophytes (4) Slime moulds

Q.16 Which of the following performs respiration with the help of plasma membrane ?
(1) Bacteria (2) Algae
(3) Fungi (4) All the above

Q.17 The most primitive monerans are :-
(1) Archaebacteria
(2) Eubacteria
(3) Filamentous bacteria
(4) Cyanobacteria

Q.18 Which bacteria are utilized in Gobar gas plant ?
(1) Methanogens (2) Nitrifying bacteria
(3) Ammonifying bacteria (4) Denitrifying bacteria

Q.19 The mode of the nutrition of bacteria is usually-
(1) Photo autotrophic
(2) Chemo autotrophic
(3) Heterotrophic and autotrophic
(4) None

Q.20 At which place bacteria are not found
(1) Soil (2) Ice (3) Sea (4) Distilled water

Q.21 The outermost limiting layer of mycoplasma is made up of
(1) cell wall (2) cell membrane
(3) mucilaginous sheath (4) slime layer

Q.22 Which of the following statements is correct?
(1) All bacteria are heterotrophic.
(2) Bacteria are either heterotrophic or chemoautotrophic.
(3) Bacteria can also be photoautotrophic.
(4) Bacteria are either photoautotrophic or chemoautotrophic.

Q.23 Which of the following characters belongs to the Kingdom Monera?
(1) Eukaryotic
(2) Heterotrophic
(3) Multicellular
(4) Presence of cell walls made of cellulose

Q.24 The chief component of bacterial cell wall is
(1) cellulose and chitin (2) cellulose and pectin
(3) peptidoglycans (4) cellulose and carbohydrates.

Q.25 _____ are saprophytic protists, whose body moves along decaying twigs and leaves engulfing organic material.
(1) Euglenoids (2) Dinoflagellates
(3) Chrysophytes (4) Slime moulds

Q.26 "Golden Algae" is the common name of Algae belonging to :-
(1) Chrysophyta (2) Pyrrophyta
(3) Euglenophyta (4) Cyanophyta

Q.27 The diatoms do not easily decay like most of the other Algae because :-
(1) They have water proof cells
(2) Their walls are mucilaginous
(3) They have highly siliceous wall
(4) They are non living

Q.28 Shell of diatoms is made up of
(1) Silica (2) Calcium carbonate
(3) Keratin (4) Calcium oxalate

Q.29 Most characteristic feature of diatoms is :-
(1) Pigments
(2) Stored food
(3) Cell wall
(4) Non oxygenic photosynthesis

Q.30 Decomposer protists are
(1) Diatoms (2) Dinoflagellates
(3) Slime moulds (4) Euglenoid

Q.31 The most efficient locomotion in protists is through
(1) Pseudopodia (2) Flagella
(3) Cilia (4) Tentacles

Q.32 Organism of which kingdom feed like animals and perform photosynthesis like plants
(1) Monera (2) Protista
(3) Mycota (4) Animalia

Q.33 Protists should be better termed as :-
(1) Acellular (2) Cellular
(3) Multicellular (4) Coenocytic

Q.34 Protists which are diploid reproduce sexually by the process of -
(1) Zygotic meiosis (2) Cyst formation
(3) Binary fission (4) Gametic meiosis

Q.35 The fungi form fruiting bodies in which _____ division occurs, leading to formation of _____ spores.
(1) Mitotic, diploid (2) Reduction, haploid
(3) Mitotic, haploid (4) Reduction, diploid

Q.36 Haploid sexual spore produced exogenously is
(1) Ascospore (2) Basidiospore
(3) Oospore (4) Zygospore

Q.37 Fungal hyphae penetrate hard cell walls of their hosts with the help of :-
(1) Enzymes (2) Hormones
(3) Sharp tips (4) Sugar Exudates

Q.38 Which of the following characters indicate similarity between fungi and animals ?
(1) Heterotrophic nutrition
(2) Type of stored food
(3) Presence of chitin
(4) All the above

Q.39 The basidiomycetes includes
(1) Rusts (2) Smuts
(3) Mushrooms (4) All the above

Q.40 Which of the following causes wheat rust disease?
(1) A red Alga (2) A green Alga
(3) A fungus (4) Mycoplasma

Q.41 The fungi are :-
(1) Autotrophic (2) Holotrophic
(3) Chemotrophic (4) Heterotrophic

Q.42 Coenocytic mycelium is found in :-
(1) Rhizopus (2) Mucor
(3) *Penicillium* (4) Both 1 and 2

Q.43 The cell wall of Fungi is composed of
(1) Chitin (2) Cellulose
(3) Mucopeptide (4) Pseudomurein

Q.44 The chief characteristic of class Ascomycetes is
(1) Formation of spores
(2) Hyphae
(3) Formation of ascospores
(4) Formation of zoospores

Q.45 Edible part in mushrooms is :-
(1) Basidiospores (2) Mycelium
(3) Pseudomycelium (4) Complete basidiocarp

Q.46 Cell wall of Chitin is found in
(1) Fungi (2) Bryophyta
(3) Bacteria (4) Angiosperms

Q.47 Occurrence of dikaryotic mycelium mainly is the characteristic of :-
(l) Myxomycetes (2) Phycomycetes
(3) Deuteromycetes (4) Basidiomycetes

Q.48 Deuteromycetes are called 'Imperfect fungi' as :-
(1) They have no cell wall
(2) No mycelium
(3) No sexual reproduction
(4) No asexual reproduction

Q.49 Absorptive mode of nutrition is found in :-
(1) Algae (2) Fungi
(3) Bryophytes (4) Euglenoids

Q.50 Which of the following is called 'toad stools' ?
(1) All mushrooms
(2) Edible mushrooms
(3) Poisonous mushrooms
(4) None

Q.51 Yeast grows more quickly in
(1) Salt water
(2) Sugar solution
(3) Double distilled water
(4) Marine water

Q.52 Fungi are ecologically important because :-
(1) They yield antibiotics
(2) They are used in genetic studies
(3) They function as decomposers
(4) All the above

Q.53 In fungi lump of hyphae is referred to as :-
(1) Thallus (2) Haustorium
(3) Mycelium (4) Archegonia

Q.54 Plant group which shows heterotrophic mode of nutrition is
(l) Algae (2) Fungi
(3) Bryophytes (4) Pteridophytes

Q.55 Non-septate mycelium occurs in :-
(1) Phycomycetes
(2) Ascomycetes
(3) Basidiomycetes
(4) Deuteromycetes

Q.56 Basidiocarp is present in :-
(1) Basidiomycetes (2) Ascomycetes
(3) Deuteromycetes (4) Phycomycetes

Q.57 Viruses that infect the bacteria are termed as
(1) Cyanophages (2) Bacteriophages
(3) Mycophages (4) Both (1) & (2)

Q.58 Who demonstrated that the extract of the infected plants of tobacco could cause infection in healthy plants?
(1) Pasteur (2) M.W. Beijerinek
(3) D.J. Ivanowsky (4) W.M. Stanley

Q.59 The protein coat called capsid made of small subunits called capsomeres are present in
(1) Viruses (2) Bacteria
(3) Fungi (4) Gymnosperms

Q.60 The association of fungi with the roots of higher plants is called
(1) Lichens (2) Mycorrhiza
(3) Slime mould (4) Neurospora

Q.61 Viruses possess all the following properties, except
(1) They are non-cellular organisms
(2) Possess both DNA and RNA
(3) Capsid protects nucleic acid
(4) Have inert crystalline structure outside living cells

Q.62 Match column I with column II and select the correct option from the codes given below.

Column-I (Group of bacteria)	**Column-II (Their shape)**
a. Coccus	(i) Rod-shaped
b. Bacillus	(ii) Spherical
c. Spirillum	(iii) Spiral
d. Vibrium	(iv) Comma-shaped

(1) a(i), b(ii), c(iii), d(iv) (2) a(ii), b(i), c(iii), d(iv)
(3) a(i), b(ii), c(iv), d(iii) (4) a(ii), b(i), c(iv), d(iii)

Q.63 Organisms which obtain energy by the oxidation of reduced inorganic compounds are called
(1) Photo autotrophs (2) Chemo autotrophs
(3) Saprozoic (4)Heterotrophs

Q.64 One of the following is not the characteristic feature of cyanobacteria.
(1) They are multicellular.
(2) They form colonies.
(3) They form blooms in polluted water bodies.
(4) They can fix atmospheric nitrogen.

Q.65 Of the following statements which are not relevant to Archaebacteria?
A. They live in some of the most harsh habitats.
B. They are present in the gut of several ruminant animals.
C. They are characterised by the presence of a rigid cellulosic cell wall.
D. They include mycoplasma.
E. They are also referred to as blue-green algae.
(1) A, B and C (2) A, C and E
(3) C, D and E (4) A, C and D

Q.66 Match the following and choose the correct combination from the options given.

Column I (Group protista)	**Column II (Example)**
A. Chrysophytes	i. *Paramaecium*
B. Dinoflagellates	ii. *Euglena*
C. Euglenoids	iii. *Gonyaulax*
D. Protozoans	iv. Diatoms

(1) A - ii, B - iii, C-i, D - iv
(2) A - ii, B - iv, C - iii, D - i
(3) A - iv, B - ii, C - iii, D - i
(4) A - iv, B - iii, C - ii, D - i

Q.67 (i) They help in respiration.
(ii) They help in cell wall formation.
(iii) They help in DNA replication.
(iv) They increase surface area of plasma membrane.
Which of the following prokaryotic structures has all the above roles?
(1) Polysome (2) Ribosome
(3) Mesosome (4) Lysosome

Q.68 Which of the following are the characters of dinoflagellates?
A. Planktonic golden yellow algae with soap box like structure.
B. Marine red biflagellated protista.
C. Appear yellow, green, brown, blue and red in colour.
D. Biflagellated organisms with pellicle.
E. Saprophytic (or) parasitic unicellular forms
(1) A, B and C only (2) B, D and E only
(3) B and C only (4) B and E only

Q.69 Match the following and choose the correct combination from the options given.

Column I	**Column II**
A. Saprophytic protists	(i) *Trypanosoma*
B. Golden algae	(ii) *Plasmodium*
C. Malarial parasite	(iii) Desmids
D. Sleeping sickness is caused by	(iv) Slime moulds

(1) A - (i), B - (ii), C - (iii), D - (iv)
(2) A - (ii), B - (iii), C - (iv), D - (i)
(3) A- (iv), B - (iii), C - (ii), D - (i)
(4) A - (iii), B - (iv), C - (ii), D - (i)

Q.70 Which is the incorrect statement regarding fungi?
(1) Wheat rust causing agent is Puccinia
(2) Penicillium is a source of antibiotic
(3) The cell wall of fungi are composed of peptidoglycan
(4) Fungi prefer to grow in warm and humid places

Q.71 With respect to fungal sexual cycle, choose the correct sequence of events.
(1) Karyogamy, plasmogamy and meiosis
(2) Meiosis, plasmogamy and karyogamy
(3) Plasmogamy, karyogamy and meiosis
(4) Meiosis, karyogamy and plasmogamy

Q.72 In class phycomycetes the mycelium is :-
(1) Coenocytic and aseptate
(2) Coenocytic and septate
(3) Uninucleate and aseptate
(4) Multinucleate and septate

Q.73 Match column I with column II and choose the right option.

Column I	**Column II**
A. *Rhizopus*	1. Ascomycetes
B. *Penicillium*	2. Basidiomycetes
C. *Ustilago*	3. Deuteromycetes
D. *Trichoderma*	4. Phycomycetes

(1) A - 4, B - 3, C- 1, D - 2
(2) A - 2, B - 3, C - 4, D - 1
(3) A - 4, B - 1, C - 2, D - 3
(4) A - 3, B - 4, C - 2, D - 1

Q.74 Which of the following does not apply to Ascomycetes?
(1) Mycelium is coenocytic and aseptate.
(2) Commonly known as sac fungi.
(3) Asexual spores called conidia are produced exogenously.
(4) They are saprophytic, decomposers, parasitic or coprophilous.

Q.75 Sexual reproduction in fungus occurs in following sequential events. Arrange them in proper sequence.
A. Karyogamy → Fusion of two nuclei
B. Plasmogamy → Fusion of protoplasm
C. Zygotic meiosis
(1) A → C → B (2) A → B → C
(3) B → A → C (4) C → A → B

Q.76 Which is correct w.r.t. lichens?
(1) Mycobiont is autotrophic component
(2) Phycobiont is heterotrophic component
(3) They are good pollution indicators
(4) They do not grow in non-polluted areas

Q.77 Symptom not seen in plants due to viruses is
(1) Mosaic formation
(2) Leaf rolling and curling
(3) Yellowing, vein clearing
(4) Root knot

Q.78 Select the correct statement.
(1) Viroids have double stranded RNA
(2) RNA of viroids have high molecular weight than viruses
(3) Mumps and Herpes are viral diseases
(4) The name virus was given by D.J. Ivanowsky

Q.79 Which of the following is wrongly matched?
(1) T.O.Diener - Viroids are found to be a free DNA
(2) W.M. Stanley - Crystallised viruses
(3) M.W.Beijerinek - Contagium vivum fluidum
(4) D.J.Ivanowsky - Microbes smaller than bacteria cause mosaic disease of tobacco

Q.80 Which of the following statements is false?
(1) TMV has a double-stranded RNA molecule.
(2) Most plant viruses are RNA viruses.
(3) The bacteriophage has a double-stranded DNA molecule.
(4) Most animal viruses are DNA viruses.

Q.81 Study the following table carefully and select the correct

Charactors	Monera	Protista	f ungi	Plantae	Animalia
Cell type	1	Eukaryotic	Eukaryotic	Eukaryotic	Eukaryotic
Cell wall	2	Present in some	Present	Present	Absent
Nuclear Membrane	Absent	Present	Present	Present	3
Body organisation	Cellular	Cellular	4	Tissue/org an	Tissue/ oragan / Organ system

	1	2	3	4
(1)	Prokaryotic	Absent	Absent	Unicellular
(2)	Prokaryotic	Present	Present	Multicellular
(3)	Eukaryotic	Present	Present	Multicellular
(4)	Eukaryotic	Absent	Absent	Unicellular

Q.82 Incorrect information is :

(1)	Monera	Cellular (Body organisation)
(2)	Protista	Cell wall usually present (Cell structure)
(3)	Fungi	Non-cellulosic cell wall (Cell structure)
(4)	Animalia	Eukaryotic (Cell type)

Q.83 A and B organisms belong to different kingdoms- P and Q respectively. Identify P and Q on the basis of following features ?

Features	P	Q
1. Cell type	Eukaryotic	Eukaryotic
2. Body organisation	Cellular	Multicellular
3. Cell wall	Usually absent	Present
4. Mode of nutrition	Autotrophic / Heterotrophic	Heterotrophic

(1) P = Protista, Q = Plantae
(2) P = Monera, Q = Animalia
(3) P = Protista, Q = Fungi
(4) P = Protista, Q = Animalia.

Q.84 Five kingdom classification was given by R.H. Whittaker in :
(1) 1822 (2) 1869 (3) 1929 (4) 1969.

Q.85 In his five kingdom classification, R.H. Whittaker has taken all of the following criteria to classify except :
(1) Cell structure (2) Thallus organization
(3) Locomotory organelle (4) Phylogenetic relationship.

Q.86 Out of the following how many characters were chosen by R.H. Whittaker for his five kingdom classification ?
1. Presence or absence of cilia
2. Cell structure
3. Presence or absence of mucus
4. Mode of nutrition
5. Reproduction
6. Cyclosis
7. Phylogenetic relationship
(1) Three (2) Four (3) Five (4) Six.

Q.87 Identify the correct statement :
(1) All plants without any exception are obligate autotrophs
(2) All fungi without any exception are obligate saprotrophs
(3) All animals without any exception are obligate heterotrophs
(4) All monerans without any exception are obligate anaerobes.

Q.88 Which of the following is considered as multicellular?
(1) Fungi (2) Virus (3) Viroid (4) Prion.

Q.89 On the basis of following chart, select the incorrect statement.

Kingdom	Cell wall	Body organisation
P	Absent	Multicellular
Q	Chitinous	Multicellular
R	Cellulosic	Multicellular
S	Polysaccharides + amino acids	Unicellular

(1) Members of P are photosynthetic
(2) Members of Q are non-photosynthetic
(3) Members of S are prokaryotic
(4) Members of R are eukaryotic.

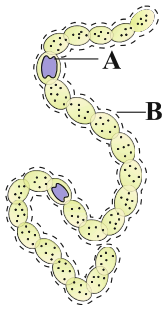
Q.90 Most of the bacteria obtain nutrition from :
(1) Sunlight
(2) Inorganic substrates
(3) Dead or decaying matter
(4) Plants.

Q.91 According to five – kingdom classification, which of the following belong to same kingdom ?
(1) Anabaena, Paramecium
(2) Chlamydomonas, Amoeba
(3) Nostoc, Chlorella
(4) Rhizopus, Plasmodium.

Q.92 Read the following statements regarding methanogens and select the correct option.
(i) They are included in the group Archaebacteria.
(ii) They are responsible for the production of biogas in gobar gas plants.
(iii) They live in hot sulphur springs.
(iv) They are strictly anaerobic.
(1) Statements (i) and (ii) are correct.
(2) Statements (i), (ii) and (iv) are correct.
(3) Statements (ii), (iii) and (iv) are correct.
(4) All statements are correct.

Q.93 Cyanobacteria are used in agricultural fields for crop improvement because they cause
(1) N_2 fixation (2) algal blooms
(3) photosynthesis (4) all of these.

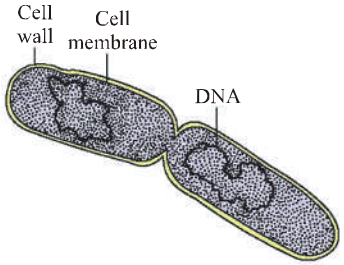
Q.94 Given figure is of filamentous blue green alga Nostoc. Identify the parts marked as A and B and select the correct option.



A	B
(1) Heterocyst	Mucilaginous sheath
(2) Vegetative cell	Mucilaginous sheath
(3) Trichomes	Cell wall
(4) Mucilaginous sheath	Heterocyst

Q.95 Select the pair that consists of plant or animal bacterial diseases.
(1) Cholera and typhoid
(2) Citrus canker and crown gall
(3) Malaria and dengue
(4) Both (1) and (2)

Q.96 Reproduction in bacteria is shown in following diagram. Select the correct match :



	Mode of Reproduction	Conditions
(1)	Budding	Favourable
(2)	Binary fission	Favourable
(3)	Spore formation	Unfavourable
(4)	Budding	Unfavourable

Q.97 Which of the following statement is incorrect regarding Monera ?
(1) Members are unicellular and prokaryotic
(2) Cell wall is non-cellulosic
(3) Mostly autotrophic
(4) Few members may be methanogens.

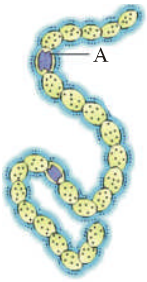
Q.98 Most common method of reproduction in bacteria during favourable conditions is :
(1) Spore formation (2) Conjugation
(3) Budding (4) Binary fission.

Q.99 Which structure helps archaebacteria to live in most harsh habitats?
(1) Cell wall (2) Plasmid
(3) Plasma membrane (4) Mesosomes.

Q.100 Methanogens can be observed in :
(1) Hot springs
(2) Extremely saline conditions
(3) Gut of ruminants
(4) Fresh water resources.

Q.101 Common in cyanobacteria and plants :
(1) Chlorophyll a (2) cell wall constituents
(3) Both (1) and (2) (4) None of the above.

Q.102 Diagram of Nostoc is given. Select the correct statement



(1) A is mucilaginous sheath and is also found in Rivularia
(2) A is mucilaginous sheath and is also found in Anabaena
(3) A is heterocyst and is also found in methanogens
(4) A is heterocyst and is also found in Anabaena.

Q.103 Which of the following organisms have been placed under Kingdom Protista?
(1) Chrysophytes and dinoflagellates
(2) Euglenoids
(3) Slime molds and protozoans
(4) All of these

Q.104 Which of the following options incorrectly distinguish the Kingdoms Monera and Protista?

	Monera	**Protista**
(1)	Includes unicellular prokaryotes	Includes multicellular eukaryotes
(2)	Membrane bound cell organelles are absent	Membrane bound cell organelles are present
(3)	Cell wall when present, made up of peptidoglycans	Cell wall, if present, contains cellulose
(4)	Flagella, when present, comprise of protein flagellin	Flagella and cilia when present, made up of protein tubulin

Q.105 Read the following statements regarding euglenoids and select the incorrect ones.
(i) These are mostly freshwater organisms found in stagnant water.
(ii) Their body is covered by a protein rich layer called pellicle which makes their body flexible.
(iii) They are photosynthetic in the presence of sunlight but become heterotrophs in the absence of sunlight.
(iv) They usually possess two flagella, one long and one short.
(v) Euglenoids are multicellular ciliate protists.
(1) (i) and (v) (2) (iv) and (v)
(3) (iii) only (4) (v) only

Q.106 Slime moulds are
(1) saprophytic protists
(2) photosynthetic protists
(3) both (1) and (2)
(4) none of these.

Q.107 The given statements describe a group of organisms.
(i) Instead of a cell wall they have a protein rich pellicle making their body flexible.
(ii) They have 2 flagella, a short and a long one.
(iii) They show mixotrophic nutrition.
(iv) They are connecting link between plants and animals.
(1) Chrysophytes (2) Dinoflagellates
(3) Slime moulds (4) Euglenoids

Q.108 Which of the following combinations of characters is true for slime molds?
(1) Parasitic, plasmodium without walls, spores dispersed by air currents
(2) Saprophytic, plasmodium with walls, spores dispersed by water
(3) Parasitic, plasmodium without walls, spores dispersed by water
(4) Saprophytic, plasmodium without walls, spores dispersed by air currents

Q.109 Which of the following is a mismatched pair of protozoan group and its example?
(1) Amoeboid protozoan – Entamoeba histolytica
(2) Flagellated protozoan – Trypanosoma
(3) Ciliated protozoan–Paramaecium caudatum
(4) Sporozoan – Leishmania donovani

Q.110 Red tide is because of the members of :
(1) Chrysophyta (2) Euglenoids
(3) Dinoflagellate (4) Slime moulds.

Q.111 Identify the mismatched one :

(1)	Desmids	These are members of kingdom Protista.
(2)	Slime moulds	Under suitable conditions these form plasmodium.
(3)	Ciliated protozoans	These possess two cilia - one large and another small.
(4)	Mycoplasma	These can survive without oxygen.

Q.112 Dispersal of spores of slime molds occur through :
(1) Air (2) Water (3) Insects (4) Crustaceans

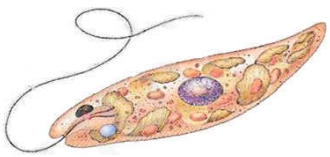
Q.113 Diatomaceous earth is having cell wall deposits of :
(1) Diatoms (2) Dinoflagellates
(3) Bacteria (4) Fungi.

Q.114 Incorrect about the spores of slime molds :
(1) Survive for many years
(2) Dispersal by air currents
(3) Produced from the base of fruiting bodies
(4) Produced under unfavourable conditions.

Q.115 A photosynthetic organism was studied and was found to be having two flagella - one long and another short. Also when such organism was deprived of sunlight, it starts acting as predator. Which of the following feature can also be expected in such organism ?
(1) Presence of pellicle
(2) Presence of a thick cell wall
(3) Presence of photosynthetic pigments dissimilar to that of plants
(4) Terrestrial mode of life.

Q.116 Spores of slime moulds are -
(1) Less resistant and survive for few weeks
(2) Less resistant and survive for few months
(3) Highly resistant and survive for few years
(4) Highly resistant and survive for many years.

Q.117 Select the incorrect statement about the given organism?



(1) Two, unequal flagella are found
(2) It dies, when deprived of sunlight
(3) Member of kingdom Protista
(4) Photosynthetic pigments are similar to those of higher plants.

Q.118 Which of the following classes of Kingdom Fungi are characterised by the presence of coenocytic, multinucleate and branched mycelium?
(1) Basidiomycetes (2) Phycomycetes
(3) Ascomycetes (4) Deuteromycetes

Q.119 Which of the following statements regarding the Class Phycomycetes is correct?
(1) These are found in aquatic habitats and on decaying wood in moist and damp places or as obligate parasites on plants.
(2) Mycelium in these fungi is aseptate and coenocytic.
(3) Asexual reproduction occurs by motile zoospores and by non-motile aplanospores.
(4) All of these

Q.120 Coenocytic mycelium is
(1) uninucleate, septate
(2) multinucleate, septate
(3) multinucleate, aseptate
(4) both (2) and (3).

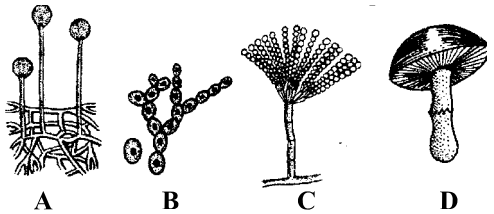
Q.121 Which of the following statements is correct regarding sexual reproduction in Basidiomycetes?
(1) Plasmogamy occurs by the fusion of two somatic cells of different strains.
(2) Karyogamy and meiosis occur in the basidium producing four basidiospores.
(3) Basidiospores are exogenously produced on the basidium.
(4) All of these

Q.122 Refer to the given figure and select the incorrect option regarding it.

(1) It belongs to Class Basidiomycetes.
(2) It is a non-edible, poisonous mushroom.
(3) It possesses an umbrella- like basidiocarp.
(4) The basidiospores in it, are exogenously produced on the basidium.

Q.123 Which of the following statements is incorrect about the Class Deuteromycetes?
(1) They reproduce only by asexual spores (conidia).
(2) Mycelium in these fungi is branched and septate.
(3) They have only parasitic forms.
(4) Examples of these fungi are Alternaria, Colletotrichum and Trichoderma.

Q.124 Select the option that correctly identifies the different genera (A, B, C and D) of Kingdom Fungi shown in figure.



A B C D

	(A)	(B)	(C)	(D)
(1)	Mucor	Saccharomyces	Morchella	Amanita
(2)	Mucor	Saccharomyces	Penicillium	Agaricus
(3)	Rhizopus	Saccharomyces	Aspergillus	Morchella
(4)	Aspergillus	Rhizopus	Penicillium	Agaricus

Q.125 Match column I with column II and select the correct option from the given codes.

Column I	Column II
A. Edible delicacies	(i) Penicillium, Streptomyces
B. Experimental genetics	(ii) Neurospora crassa
C. Source of antibiotics	(iii) Puccinia, Ustilago
D. Rust and smut diseases	(iv) Morels and truffles

(1) A-(iv), B-(ii), C-(iii), D-(i)
(2) A-(iii), B-(i), C-(ii), D-(iv)
(3) A-(iv), B-(ii), C-(i), D-(iii)
(4) A-(iv), B-(iii), C-(ii), D-(i)

Q.126 On the basis of following features, identify the kingdom to which the organism belongs to :
A. Cell wall – non cellulosic
B. Cell type – Eukaryotic
C. Body organisation – Multicellular
(1) Animalia (2) Protista
(3) Phycomycetes (4) Fungi.

Q.127 Among fungi, conidia is the mode of asexual reproduction in members of :
(1) Ascomycetes
(2) Deuteromycetes
(3) Phycomycetes and Basidiomycetes
(4) Ascomycetes and Deuteromycetes.

Q.128 Identify the correct match :
(1) Nostoc – Photosynthetic autotroph
(2) Euglena – Marine protist
(3) Ustilago – Rust fungi
(4) Gonyaulax – saprophytic protist.

Q.129 How many of the following possess cell wall?
1. Mycoplasma 2. Bacteria
3. Chrysophytes 4. Deuteromycetes
(1) One (2) Two (3) Three (4) All.

Q.130 Identify the incorrect pair of examples :
(1) Amoeboid protozoans – Amoeba, Entamoeba
(2) Multicellular fungi – Puccinia, Penicillium
(3) Eubacteria with heterocysts – Nostoc , Anabaena
(4) Insectivorous plants – Bladderwort, Cuscuta.

Q.131 Deuteromycetes is also known as imperfect fungi because :
(1) Members are not well differentiated
(2) Mycelium is aseptate and coenocytic
(3) Members do not produce zoospores
(4) It lacks sexual reproduction.

Q.132 Which of the following are members of deuteromycetes?
(1) Alternaria, Trichoderma
(2) Ustilago, Puccinia
(3) Neurospora, Claviceps
(4) Penicillium, Yeast.

Q.133 Presence of some bacteria is expected in hot springs. These are :
(1) Archaebacteria
(2) Phototropic autotrophs
(3) Chemosynthetic autotrophs
(4) Heterotrophic eubacteria

Q.134 Identify the incorrect match :

	Class of Fungi	Sexual / Asexual spores	Example
(1)	Phycomycetes	Oospores	Rhizopus
(2)	Ascomycetes	Ascospores	Neurospora
(3)	Basidiomycetes	Conidia	Agaricus
(4)	Deutromycetes	Conidia	Alternaria

Q.135 Which pair belong to same class of fungi ?
(1) Agaricus, Colletotrichum
(2) Aspergillus, Yeast
(3) Mucor, Puccinia
(4) Ustilago, Claviceps.

Q.136 Edible fungi like morels and truffles belong to the class:
(1) Ascomycetes (2) Basidiomycetes
(3) Deuteromycetes (4) Phycomycetes.

Q.137 Dikaryophase in some fungi is represented as :
(1) 2n (2) n + n (3) 2n + 2n (4) 2n + n.

Q.138 How many of the following spores are not meant for asexual reproduction in fungi ?
[Conidia, Zoospores, Basidiospores, Ascospores, Oospores, Alpanospores]
(1) Two (2) Three
(3) Four (4) Five.

Q.139 Incorrect about lichens is :
(1) Phycobiont and mycobiont are two components.
(2) These act as pollution indicator
(3) These are example of symbiotic association between fungi and bacteria
(4) Phycobiont is autotrophic component.

Q.140 What is common between two given fungi?

(1) Mycelium is septate and branched
(2) Asexual reproduction occurs by conidia
(3) Both produce ascospores
(4) Both are commonly known as sac fungi.

Q.141 Which component of lichens is not auto-trophic?
(1) Phycobiont (2) Mycobiont
(3) Both (1) and (2) (4) None

Q.142 Dikaryophase of fungus is observed in class :
(1) Phycomycetes
(2) Ascomycetes
(3) Ascomycetes and Basidiomycetes
(4) Basidiomycetes and Deuteromycetes.

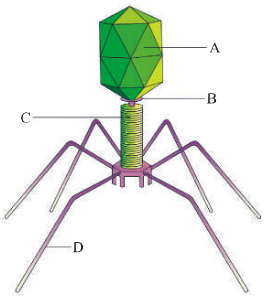
Q.143 Identify the incorrect statement :
(1) Conidia in ascomycetes are exogenously produced
(2) Basidiospores in mushrooms are exogenously produced
(3) Zoospores in Mucor are endogenously produced
(4) Ascospores in sac fungi are exogenously produced.

Q.144 Identify the mismatched.

	Genus	Character / Fact	Class / Group
(1)	Albugo	Aseptate and coenocytic mycelium	Phycomycetes
(2)	Penicillium	Asexual reproduction by conidia	Ascomycetes
(3)	Euglena	Presence of 2 flagella	Euglenoids
(4)	Gonyaulax	Decomposer	Chrysophyta

Q.145 Select the option with edible fungi -
(1) Buffles only
(2) Truffles only
(3) Both buffles and morels
(4) Both morels and truffles.

Q.146 In a bacteriophage A – D are labelled. Select the correct information ?



(1) A - Head, B - Tail fibres
(2) A - Head, D - Sheath
(3) B - Collar, D - Tail fibres
(4) C - Sheath, A - Collar.

Q.147 Bacteriophages usually have :
(1) ssRNA (2) dsRNA (3) ssDNA (4) dsDNA

Q.148 Whose contribution in virology is incorrectly mentioned ?

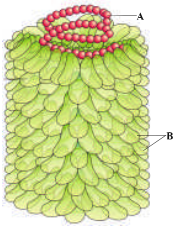
(1)	D. Ivanowsky	Reported that microbes that are even smaller than bacteria are responsible for mosaic disease of tobacco.
(2)	Pasteur	Given the term virus
(3)	Beijerinek	Crystallization of virus
(4)	Diener	Discovery of viroids

Q.149 Incorrect about virus :
(1) Host specific (2) Inactive outside host
(3) Can be crystallized (4) None.

Q.150 Unit of protein coat in viruses that protect the genetic material is
(1) Capsid (2) Peplomere
(3) Telomere (4) Capsomere.

Q.151 Viroid can be defined as :
(1) ds DNA with protein coat
(2) free RNA
(3) ssRNA with capsid
(4) free DNA.

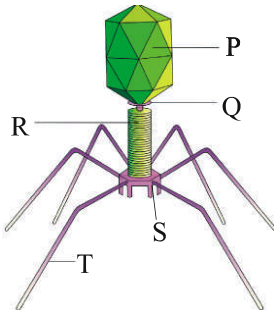
Q.152 Study the given figure of structure of TMV (Tobacco Mosaic Virus) and select the option that correctly identifies the labellings A and B.



	A	B
(1)	ss-DNA	Capsomeres
(2)	ds-DNA	Capsomeres
(3)	ss-RNA	Capsomeres
(4)	ds-RNA	Tail fibres

Q.153 Which of the following statements regarding viruses are correct?
(i) These are cellular, infectious, nucleoprotien particles.
(ii) They can be grown in culture medium.
(iii) Genetic material is either DNA or RNA, but never both.
(iv) They can be crystallised.
(1) (i) and (ii) (2) (ii) and (iii)
(3) (iii) and (iv) (4) (i), (ii), (iii) and (iv)

Q.154 Given is an electron microscopic structure of a T-bacteriophage. Identify the unlabelled parts and select the correct option for P, Q, R, S and T.



	P	Q	R	S	T
(1)	Head	Collar	Sheath	Basal plate	Tail fibre
(2)	Head	Collar	Sheath	Tail	Tail fibre
(3)	Capsid	Sheath	Basal plate	Tail	Tail fibre
(4)	Head	Collar	Sheath	Capsomere	Tail fibre

Q.155 Select the pair that consists of viral diseases.
(1) Mumps and small pox
(2) Herpes and influenza
(3) Pneumonia and syphilis
(4) Both (1) and (2)

Q.156 In plants, mosaic formation, leaf rolling and curling, yellowing of plant parts, vein clearing, dwarfing and stunted growth, necrosis etc. are the symptoms of
(1) bacterial diseases (2) mycoplasmal diseases
(3) viral diseases (4) fungal diseases.

MATCHING TYPE QUESTIONS

Q.157 Match column I with column II and select the correct option from the codes given below.

	Column I (Categories)		**Column II** (Examples)
A.	Chrysophyte	1	*Gonyaulax*
B.	Dinoflagellate	2	*Euglena*
C.	Euglenoids	3	Diatoms
D.	Slime moulds	4	*Plasmodium*

Codes:

	A	B	C	D
(1)	1	3	2	4
(2)	1	4	2	3
(3)	3	2	4	1
(4)	3	1	2	4

Q.158 Match column I with column II and select the correct option from the codes given below.

	Column I (Categories)		**Column II (Examples)**
A.	Phycomycetes	1	*Altemaria* and *Trichoderma*
B.	Ascomycetes	2	*Agaricus* and *Ustilago*
C.	Basidiomycetes	3	*Aspergillus*, *Claviceps* and *Neurospora*
D.	Deuteromycetes	4	*Mucor* and *Rhizopus*

Codes:

	A	B	C	D
(1)	1	4	3	2
(2)	2	1	4	3
(3)	4	3	2	1
(4)	3	2	1	4

Q.159 Match column I with column II and select the correct option from the codes given below.

	Column I (Categories)		**Column II (Common names)**
A.	Phycomycetes	1.	Algal fungi
B.	Ascomycctes	2	Imperfect fungi .
C.	Basidiomycetes	3	Bracket fungi
D.	Deuteromycetcs	4	Sac fungi

Codes:

	A	B	C	D
(1)	2	1	4	3
(2)	4	3	2	1
(3)	1	4	3	2
(4)	3	2	1	4

Q.160 Match column I with column II and select the correct option from the codes given below.

Column-I	**Column - II**
A. Saprophyte	(i) Symbiotic association of fungi with plant roots
B. Parasite	(ii) Decomposition of dead organic materials
C. Lichens	(iii)Living on living plants or animals
D.Mycorrhiza	(iv) Symbiotic association of algae and fungi

Choose the correct answer from the option given below

	A	B	C	D
(1)	(i)	(ii)	(iii)	(iv)
(2)	(iii)	(ii)	(i)	(iv)
(3)	(ii)	(i)	(iii)	(iv)
(4)	(ii)	(iii)	(iv)	(i)

Q.161 Match column I with column II and select the correct option from the codes given below.

	Column I (Features)		**Column** II (Protista)
A.	Chief producer in the oceans	1	Diatoms
B.	Red tide	2	Dinoflagellates
C.	Connecting link between plants and animals	3	Euglenoids
D.	Fungus animals	4	Slime moulds

Codes:

	A	B	C	D
(1)	2	3	4	1
(2)	3	4	1	2
(3)	1	2	3	4
(4)	4	1	2	3

Q.162 Match column I with column II and select the correct option from the codes given below.

	Column I (Scientists)		**Column II** (Related to)
A.	DJ Ivanowsky (1892)	1.	Viroids
B.	MW Beijerinck (1898)	2	First crystallised TMV
C.	WM Stanley (1935)	3	*Contagiwn vivum fluidum*
D.	TO Diener (1971)	4	Mosaic disease of tobacco

Codes:

	A	B	C	D
(1)	1	4	3	2
(2)	2	1	4	3
(3)	4	3	2	1
(4)	4	3	1	2

Q.163 Match column I with column II and select the correct option from the codes given below.

	Column-I (Kingdoms)		**Column-II (Classes)**
(A)	Plantae	1	Archaebacteria
(B)	Fungi	2	Euglenoids
(C)	Protista	3	Phycomycetes
(D)	Monera	4	Algae

	A	B	C	D
(1)	4	3	2	1
(2)	1	2	3	4
(3)	3	4	2	1
(4)	4	2	3	1

Q.164 Match column I with column II and select the correct option from the codes given below.

Column-I	**Column-II**
(i) *Trichoderma*	(a) Deuteromycetes
(ii) Yeast	(b) Basidiomycetes
(iii) Bread mould	(c) Phycomycetes
(iv) Smut	(d) Ascomycetes

(1) i - d, ii - a, iii - c, iv - b (2) i - a, ii - d, iii - b, iv - c
(3) i - a, ii - d, iii - c, iv - b (4) i - a, ii - c, iii - b, iv - d

Q.165 Match column I with column II and select the correct option from the codes given below.

	Column I		**Column II**
A.	Saprophytic protists	(i)	*Trypanosoma*
B.	Golden algae	(ii)	*Plasmodium*
C.	Malarial parasite	(iii)	Desmids
D.	Sleeping sickness is caused by	(iv)	Slime moulds

(1) A - (i), B - (ii), C - (iii), D - (iv)
(2) A - (ii), B - (iii), C - (iv), D - (i)
(3) A - (iv), B - (iii), C - (ii), D - (i)
(4) A - (iii), B - (iv), C - (ii), D - (i)

Q.166 Match column I with column II and select the correct option from the codes given below.

	Column I (Names)		**Column II** (Shape)
A.	Coccus	1	Rod-shaped
B.	Bacillus	2	Spherical
C.	Vibrio	3	Spiral-shaped
D.	Spirillum	4	Comma-shaped

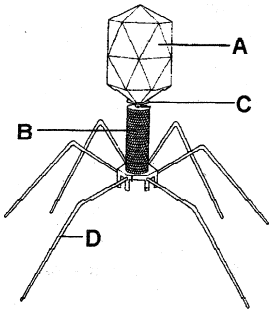
Codes:

	A	B	C	D
(1)	3	2	1	4
(3)	2	1	4	3

	A	B	C	D
(2)	4	3	2	1
(4)	1	4	3	2

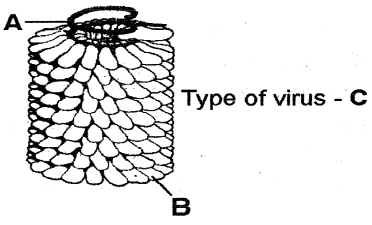
IMAGE BASED QUESTIONS

Q.167 Given below is the diagram of a bacteriophage. In which one of the options all the four parts A, B, C and D are correct?



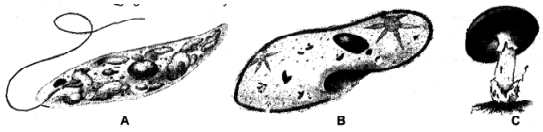
	A	B	C	D
(1)	Tail fibres	Head	Sheath	Collar
(2)	Sheath	Collar	Head	Tail fibres
(3)	Head	Sheath	Collar	Tail fibres
(4)	Collar	Tail fibres	Head	Sheath

Q.168 Given below is the diagram of a virus. In which one of the options A, B and C are correct?



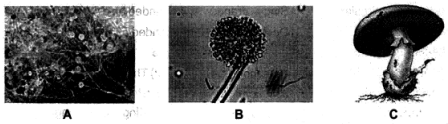
	A	B	C
(1)	RNA	Capsid	Tobacco Mosaic Virus
(2)	DNA	Capsid	Tobacco Mosaic Virus
(3)	RNA	Lipid	Tobacco Mosaic Virus
(4)	RNA	Protein	HIV

Q.169 Observe the following figures and identify them.



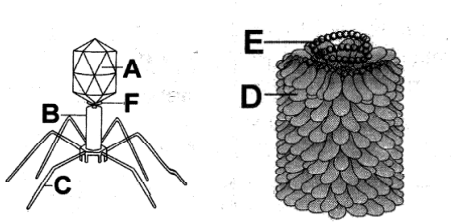
(1) A-*Euglena*, B-*Paramecium*, C-*Agaricus*
(2) A-*Euglena*,B-*Planaria*, C-*Agaricus*
(3) A-*Planaria*, B-*Paramecium*, C-*Agaricus*
(4) A -*Euglena*, B-*Paramecium*, C-*Aspergillus*

Q.170 Identify A, B and C in given diagram.



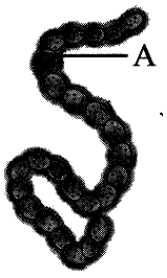
(1) A - *Mucor*, B - *Aspergillus*, C - *Agaricus*
(2) A - *Mucor*, B - *Agaricus*, C - *Aspergillus*
(3) A- *Agaricus*, B - *Mucor*, C - *Aspergillus*
(4) A - *Agaricus*, B - *Aspergillus*, C - *Mucor*

Q.171 Identify (B), (D) and (F) in these figures:



(1) B = Collar, D = RNA, F = Sheath
(2) B = Capsid, D = Sheath, F = DNA
(3) B = Sheath, D = Capsid, F = Collar
(4) B = Sheath, D = Capsid, F = RNA

Q.172 Which of the following statement is correct w.r.t. above diagram ?

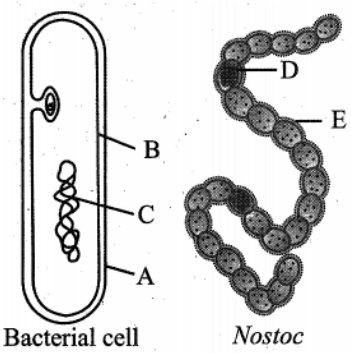


(1) 'A' is mucilaginous sheath and is also found in *Laminaria*
(2) 'A' is mucilaginous sheath and is also found in *Anabaena*
(3) 'A' is heterocyst and is also found in methanogens
(4) 'A' is heterocyst and is also found in *Anabaena*

Q.173 The given fungus belong to which class ?

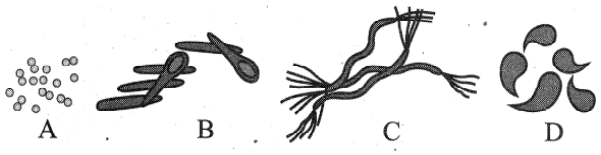
(1) Basidiomycetes (2) Phycomycetes
(3) Ascomycetes (4) Deuteromycetes

Q.174 Which one of the following option is correct for the given diagrams labelled as A, B, C, D and E?



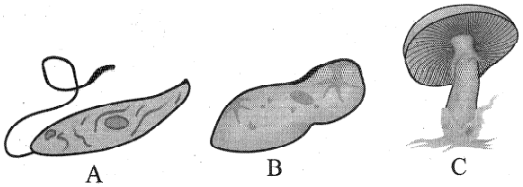
(1) A - Cell wall, B - Cell membrane, C -Heterocyst, D - DNA, E - Mucilagenous sheath
(2) A - Cell wall, B - Cell membrane, C - DNA, D - Heterocyst, E - Mucilagenous sheath
(3) A - Mucilagenous sheath, B - Cell membrane, C - DNA, D - Heterocyst, E - Cell wall
(4) A - Cell membrane, B - Cell wall, C - DNA, D - Heterocyst, F - Mucilagenous sheath

Q.175 Choose the correct names of the different bacteria according to their shapes.



(1) A - Cocci, B - Bacillia, C - Spirilla, D - Vibrio
(2) A - Bacillia, B - Cocci, C - Spirilla, D - Vibrio
(3) A - Spirilla. B - Bacillia, C - Cocci, D - Vibrio
(4) A - Spirilla, B - Vibrio, C - Cocci, D - Bacillia

Q.176 Identify the following figures.



(1) A - *Euglena*, B - *Paramecium*, C - *Agaricus*
(2) A - *Euglena*, B - *Planaria*, C - *Agaricus*
(3) A - *Planaria*, B - *Paramecium,* C - *Agaricus*
(4) A - *Euglena*, B - *Paramecium*, C - *Aspergillus*

Q.177 Identify the diagram of heterocyst.

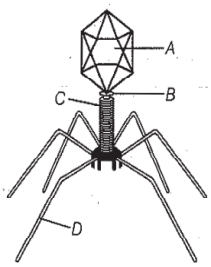
(1) 

(2) 

(3) 

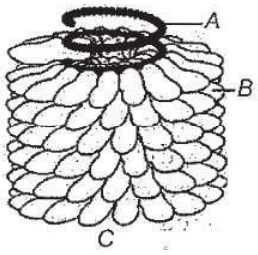
(4) 

Q.178 Identify the label A, B, C and D in the following figure.



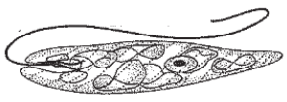
(1) A – Head, B – Collar, C – Sheath, D – Tail fibres
(2) A – Collar, B – Head, C – Sheath, D – Tail fibres
(3) A – Head, B – Collar, C – Tail fibres, D – Sheath
(4) A – Collar, B – Tail fibres, C – Head, D – Sheath

Q.179 Given below is the diagram of a virus. In which one of the options, all the three A, B and C (name of the virus) are correct?



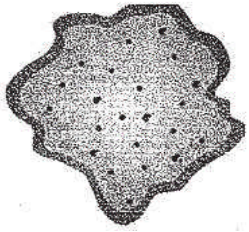
(1) A – RNA, B – Capsomere, C – Tobacco mosaic virus
(2) A – DNA, B – Capsid, C – Bacteriophage
(3) A – RNA, B – Capsid, C – Tobacco mosaic virus
(4) A – DNA, B – Capsid, C – Bacteriophage

Q.180 Which group of organisms is represented by the given figure?



(1) Dinoflagellates (2) Protozoans
(3) Slime mould (4) Euglenoids

Q.181 Identify the given figure and select the correct option.

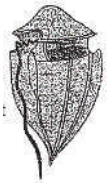


(1) It is marine water plankton
(2) It is a saprophytic protist
(3) It is parasitic predator believed to but primary relative of animals
(4) Ciliated protozoan

Q.182 Given figure is of a filamentous blue-green algae. Identify the algae and choose the option that is correct for A, B and C in the figure.

(1) A – *Gelidium*, B – Vegetative cell, C – Heterocyst
(2) A – *Volvox*, B – Somatic cell, C – Mucilagenous sheath
(3) A – *Chara*, B – Mucilagenous sheath, C – Heterocyst
(4) A – *Nostoc*, B – Heterocyst, C – Mucilagenous sheath

Q.183 Refer to diagram given along side and select the incorrect option regarding it.



(1) It belongs to kingdom-Protista and is a dinoflagellate
(2) It is mostly marine, photosynthetic with colour depending on main pigment present in its cells
(3) They have two flagella, a short and a long one
(4) These organisms release toxins in large number which kill other marine animals

MULTI STATEMENT QUESTIONS

Q.184 Consider the following statements about sexual reproduction.
I. In class-Phycomycetes, sexual reproduction produces a resting diploid spore called zygospore.
II. Zygospores are formed by the fusion of two gametes.
III. All zygospores are of isogamous type.
Which of the statements given above are correct?
(1) I and II (2) I and III
(3) II and III (4) All of these

Q.185 Analyse the following statements about class-Ascomycetes.
I. Mycelium is branched and septate.
II. The asexual spores are conidia, produced on the special mycelium called conidiophores.
III. Sexual spores are called ascospores, which are produced in sac-like asci.
Which of the statements given above are correct?
(1) I and II (2) I and III
(3) II and III (4) All of these

Q.186 Consider the following statements.
I. Mycelium is branched and septate.
II. The asexual spores are generally not formed.
III. Vegetative reproduction takes place by fragmentation.
IV. Sex organs are absent, but sexual reproduction take place by somatogamy.
V. Karyogamy and meiosis take place in basidium to from four haploid basidiospores.
VI. Basidia are arranged in fruiting bodies called basidiocarp.
The above statements are assigned to
(1) sac fungi
(2) bracket fungi
(3) imperfecti fungi
(4) Bread Mould

Q.187 Consider the following statements about plants.
I. Kingdom-Plantae includes eukaryotic, autotrophic, chlorophyll containing organisms.
II. It includes algae, bryophytes, pteridophytes, gymnosperms, but not angiosperms.
III. Plants show alternation of generation [between haploid gametophytic (n) phase and diploid sporophytic (2n) phase].
Which of the statements given above are correct?
(1) I and II
(2) I and III
(3) II and III
(4) All of these

Q.188 Which of the following statements are correct ?
(A) Bacteria are the sole members of the kingdom monera
(B) Bacteria can survive without oxygen and some of them are pathogenic
(C) Bacteria reproduce by a sexual method of reproduction
(D) Heterotrophic bacteria use chemical energy for food synthesis
(E) Some archaebacteria show symbiotic-association.
(1) (A), (B) and (C) are correct
(2) (C), (D) and (E) are correct
(3) (A), (B), (C) and (D) are correct
(4) (A), (C) and (D) are correct

Q.189 Consider the following statements.
I. In this group, the plasmodium differentiates and forms fruiting bodies, bearing spores at their tips.
II. Spores possess true walls.
III. The spores are dispersed by air currents.
IV. The spores are extremely resistant and survive for many years even under adverse conditions.
The above statements are assigned to
(1) euglenoids (2) slime moulds
(3) dinoflagellates (4) chrysophytes

Q.190 I. Dmitri Ivanowsky (1892) recognised certain microbes as causal organisms of the mosaic disease of tobacco.
II. M.W. Beijerinek (1898) desmonstrated that the extract of infected plants of tobacco could cause infection in healthy plants and called the fluid as contagium vivum fluidum.
III. W.M. Stanley (1935). showed that these microbes could be crystallised and crystals consist largely of protein.
The above statements are assigned to
(1) Bacteria (2) Virus
(3) Prions (4) Lichens

Q.191 Which of the following statements are false about viruses?
I. Viruses are facultative parasites.
II. Viruses can multiply only when they are inside the living cells.
III. Viruses cannot pass bacterial proof filters.
IV. Viruses do not contain proteins, DN A and RNA.
(1) I, II and III
(2) II , III and IV
(3) I, III and IV
(4) All of these

Q.192 To Diener (1971) discovered a new infectious agent that was smaller than viruses.
Consider the following statements about this infectious agent.
I. It causes potato spindle tuber disease.
II. These are infectious RTLV particles.
III. It lacks a protein coat.
IV. The molecular weight of its RNA is low.
The above statements are assigned to
(1) viruses (2) viroids
(3) prions (4) lichen

Q.193 Study the following statements and identify the correct option given below.
I. Viruses that infect plants tiave single-stranded RNA and viruses that infect animals have either single or double-stranded RNA or double-stranded DNA.
II. Bacterial viruses or Bacteriophages are usually' single-stranded RNA viruses.
(1) I is true, but II is false (2) I is false, but II is true
(3) I and II are true (4) I and II are false

Q.194 Which of the following statements correctly describe viruses?
I. Simple and unicellular organisms.
II. Contain DNA or RNA and enclosed by protein coat.
III. Possess own metabolic system and respond to stimuli
IV. Maintain genetic continuity and undergo mutations.
The correct combination is
(1) I and II (2) II and IV (3) II and III (4) I and III

Q.195 Read the following statements regarding archaebacteria and select the correct option.
I. Archaebacteria differ from other bacteria in having different cell wall structure.
II. Halophils are present in gut of several rumenant animals
III. Thermoacidophiles have dual ability to tolerate high temperature as well as high acidity.
Which of the statements given above are correct?
(1) I and II (2) I and III
(3) II and III (4) All of the above

Q.196 Analyse the following statements, and identify the correct option given below.
I. In diatoms the walls are embedded with silica and thus the walls are indestructible.
II. Diatoms have left behind large amount of cell wall deposits in their habitat, this accumulation over billions of years is referred to as diatomaceous deposition or diatomaceous earth.
(1) I is true, but II is false (2) I is false, but II is true
(3) I and II are true (4) I and II are false

Q.197 In Phycomycetes, asexual reproduction takes place by zoospores or by aplanospores. Regarding these spores, consider the following statements and choose the correct option.
I. Zoospores are motile and aplanospores are non-motile in nature.
II. These spores are endogenously produced in sporangium.
Which of the statements are true and false?
(1) I is true, but II is false
(2) I is false, but II is true
(3) I and II are true
(4) I and II are false

ASSERTION AND REASON

In the following questions, a statement of assertion is followed by a statement of reason, Mark the correct choice as :
(1) If both assertion and reason are true and reason is the correct explanation of assertion.
(2) If both assertion and reason are true but reason is not the correct explanation of assertion.
(3) If assertion is true but reason is false.
(4) If assertion is false but reason is true.

Q.198 **Assertion:** Deuteromycetes are called as imperfect fungi.
Reason: Only asexual or vegetative phases of these fungi are known.

Q.199 **Assertion:** Diatomaceous earth is used in polishing. Alteration of oil and syrups.
Reason: Diatoms are chief producers in ocean.

Q.200 **Asertion :** Five kingdom system of classification did not differentiated between the heterotrophic group, fungi and the autotrophic green plants. Though they showed a characteristic difference in their cell wall composition.
Reason : Fungal cell wall contains chitin, while green plants have a cellulosic cell wall.

Q.201 **Assertion :** Fungi are wide spread in distribution and they can even live on or inside other plants and animals.
Reason : Fungi are able to grow anywhere on land, water or on other organisms because they have variety of pigments including chlorophyll, carotenoids, fucoxanthin and phycoerythrin.

Q.202 **Assertion :** In fungi, sexual apparatus decreases in complexity from lower to higher forms.
Reason : In algae, sexual apparatus increases in complexity from simple to higher forms.

Q.203 **Assertion :** Viruses cause diseases and replicate when they are in the host cell.
Reason : Viruses do not replicate outside the host, but they survive in environment.

Q.204 **Assertion :** Polluted water bodies have high abundance of *Nostoc* and *Oscillatoria.*
Reason : These blue-green bacteria can tolerate adverse conditions very well compared to other aquatic plants.

Q.205 **Assertion :** Slime moulds are called as fungus like animals.
Reason : These do not have cell wall.

Q.206 **Assertion :** Kingdom-Plantae includes all eukaryotic, chlorophyll containing organisms.
Reason : Few of its members are partially heterotrophic.

STATEMENT BASED QUESTIONS

Read the following statements and select the correct option.
(1) Both Statement-I and Statement-II are correct.
(2) Statement-I is correct but Statement-II is incorrect.
(3) Statement-I is incorrect but Statement-II is correct.
(4) Both Statement-I and Statement-II are incorrect.

Q.207 **Statement I :** The viruses are non-cellular organisms that are characterised by having an inert. Crystalline structure inside the living cell.
Statement II : The name virus that means venom or poisonous fluid was given by Pasteur.

Q.208 **Statement I :** Lichens are symbiotic associations between algae and fungi.
Statement II : The algal component is known as mycobiont and fungal component as phycobiont.

Q.209 **Statement I :** M. W. Beijernick showed that virus could be crystallised
Statement II : Pasteur recognised certain microbes as causal organism of the mosaic disease of tobacco.

Q.210 **Statement I :** In general, viruses that infect plants have single stranded RNA.
Statement II : Viruses that infect animals have either single or double stranded RNA or double stranded DNA.

Q.211 **Statement I :** Archaebacteria are special since they live in some of the most harsh habitats.
Statement II : Archaebacteria having a different cell wall structure and this feature is responsible for their survival in extreme conditions.

Q.212 **Statement -I:** The mycoplasma are organisms that have a rigid cell wall.
Statement-II: Mycoplasma are the smallest living cells known that can servive only in presence of oxygen.

Q.213 **Statement -I:** Dinoflagellates cell wall has stiff cellulose plates on the outer surface.
Statement-II: Most of Dinoflagellates have two flagella.

Q.214 **Statement -I:** Euglenoids have a silica rich layer called pellicle which makes their body flexible.
Statement-II: The pigments of euglenoids are identical to those present in higher plants.

Q.215 **Statement I :** Ciliated protozoans are aquatic, actively moving organisms because of the presence of thousands of cilia.
Statement II : Ciliated protozoans have a cavity (gullet) that opens to the inside of the cell surface.

Q.216 **Statement I :** When a fungus reproduces sexually, two haploid hyphae of compatible mating comes together and fuse.
Statement II : In some fungi the fusion of two haploid cells immediately results in diploid cells.

Q.217 **Statement I :** In basidiomycetes the mycelium is aseptate and coenocytic.
Statement II : In basidiomycetes the sex organs are present but plasmogamy is brought about by fusion of two vegetative cells of different strains.

Q.218 **Statement I :** *Penicillium,* yeast (*saccharomyces*), *Aspergillus, Claviceps* and *Neurospora* fungi are members of ascomycetes.
Statement II : Mycelium is branched and septate. The asexual spores are conidia which produced exogenously on the special mycelium called conidiophores.

Q.219 **Statement I :** Slime moulds during unfavourable conditions, they form an aggregation called *Plasmodium* which may grow and spread over several feet.
Statement II : Slime moulds during favourable conditions, the *Plasmodium* differentiates and forms fruiting bodies bearing spores at their tips.

Q.220 **Statement I :** The cell wall of euglenoids is rich in protein which makes their body flexible.
Statement II : Euglenoids are photosynthetic in the presence of sunlight, when deprived of sunlight they behave like heterotrophs by predating on other smaller organisms.

Q.221 **Statement I :** In phycomycetes and ascomycetes, an intervening dikaryotic stage occurs, such a condition is called dikaryon and the phase is called dikaryophase of fungus.
Statement II : The fungi form fruiting bodies in which reduction division occurs, leading to formation of haploid spores.

Q.222 **Statement I :** T.O. Diener discovered a new infectious agent that was smaller than viruses and caused potato spindle tuber disease.
Statement II : It was found to be a free RNA, it lacked the protein coat, that is found in viruses, hence the name viroid.

Q.223 **Statement I :** Aristotle was the earliest to attempt a more scientific basis for classification.
Statement II : Aristotle used simple morphological characters to classify plants into trees and shrubs.

Q.224 **Statement I :** All prokaryotic organisms were grouped together under kingdom monera and the multicellular organisms were placed in kingdom-protista.
Statement II : Kingdom protista has brought together *Chlamydomonas*, *Chlorella* with *Paramaecium* and amoeba.

Q.225 **Statement I :** The bacterial structure is very complex, they are very simple in behaviour.
Statement II : Compared to many other organisms, bacteria as a group show the least extensive metabolic diversity.

Q.226 **Statement I :** Archaebacteria differ from other bacteria in having a different cell wall structure.
Statement II : Methanogens are present in the gut of several ruminant animals such as cows and buffaloes.

Q.227 **Statement I :** *Nostoc* and *Anabaena* can fix atmospheric nitrogen in specialised cells called heterocysts.
Statement II : Chemosynthetic autotrophic bacteria oxidise various organic substances such as nitrates, nitrites and ammonia and use the released energy for their ATP production.

NEET PREVIOUS YEAR'S

Q.1 The motile bacteria are able to move by : **[AIPMT-2014]**
(1) Fimbriae (2) Flagella
(3) Cilia (4) Pili

Q.2 Which of the following shows coiled RNA strand and capsomeres ? **[AIPMT-2014]**
(1) Polio virus
(2) Tabocco mosaic virus
(3) Measles virus
(4) Retrovirus

Q.3 Viruses have : **[AIPMT-2014]**
(1) DNA enclosed in a protein coat
(2) Prokaryotic nucleus
(3) Single chromosome
(4) Both DNA and RNA

Q.4 Select the wrong statement : **[AIPMT-2015]**
(1) The term 'contagium vivum fluidum' was coined by M.W. Beijerinek.
(2) Mosaic disease in tobacco and AIDS in human being are caused by viruses.
(3) The viroids were discovered by D.J. Ivanowsky.
(4) W.M. Stanley showed that viruses could be crystallised.

Q.5 Cell wall is absent in : **[AIPMT-2015]**
(1) Mycoplasma (2) Nostoc
(3) Aspergillus (4) Funaria

Q.6 The structures that help some bacteria to attach to rocks and/or host tissues are : **[AIPMT-2015]**
(1) Mesosomes (2) Holdfast
(3) Rhizoids (4) Fimbriae

Q.7 In which group of organisms the cell walls forms two thin overlapping shells which fit together ? **[AIPMT-2015]**
(1) Dinoflagellates (2) Slime moulds
(3) Chrysophytes (4) Euglenoids

Q.8 Which one is a wrong statement ? **[AIPMT-2015]**
(1) Haploid endosperm is typical feature of Gymnosperms
(2) Brown algae have chlorophyll a and c and fucoxanthin.
(3) Archegonia are found in Bryophyta, Pteridophyta and Gymnosperms.
(4) Mucor has biflagellate zoospores.

Q.9 The imperfect fungi which are decomposers of litter and help in mineral cycling belong to: **[AIPMT-2015]**
(1) Phycomycetes (2) Ascomycetes
(3) Deuteromycetes (4) Basidiomycetes

Q.10 Choose the wrong statement : **[AIPMT-2015]**
(1) Morels and truffles are poisonous mushrooms
(2) Yeast is unicellular and useful in fermentation
(3) Penicillium is multicellular and produces antibiotics
(4) Neurospora is used in the study of biochemical genetics.

Q.11 Which of the following statements is wrong for viroids? **[NEET I-2016]**
(1) They cause infections
(2) Their RNA is of high molecular weight
(3) They lack a protein coat
(4) They are smaller than viruses

Q.12 Which one of the following statements is wrong ? **[NEET I-2016]**
(1) Eubacteria are also called false bacteria
(2) Phycomycetes are also called algal fungi
(3) Cyanobacteria are also called blue-green algae
(4) Golden algae are also called desmids.

Q.13 Chryophytes, Euglenoids, Dinoflagellates and Slime moulds are included in the Kingdom : **[NEET I-2016]**
(1) Fungi (2) Animalia
(3) Monera (4) Protista.

Q.14 Which of the following is the major component of cell wall of most fungi : **[NEET I-2016]**
(1) Cellulose (2) Hemicellulose
(3) Chitin (4) Peptidoglycan

Q.15 Methanogens belong to : **[NEET II-2016]**
(1) eubacteria (2) archaebacteria
(3) dinoflagellates (4) slime moulds

Q.16 Which of the following are found in extreme saline conditions? **[NEET-2017]**
(1) Eubacteria (2) Cyanobacteria
(3) Mycobacteria (4) Archaebacteria

Q.17 Which among the following are the smallest living cells, known without a definite cell wall, pathogenic to plants as well as animals and can survive without oxygen? **[NEET-2017]**
(1) Pseudomonas (2) Mycoplasma
(3) Nostoc (4) Bacillus

Q.18 Which of the following components provides sticky character to the bacterial cell? **[NEET-2017]**
(1) Nuclear membrane
(2) Plasma membrane
(3) Glycocalyx
(4) Cell wall

Q.19 DNA replication in bacteria occurs. **[NEET-2017]**
(1) within nucleolus
(2) prior to fission
(3) just before transcription
(4) during S phase

Q.20 Mycorrhizae are the example of: **[NEET-2017]**
(1) Amensalism (2) Antibiosis
(3) Mutualism (4) Fungistasis

Q.21 Select the wrong statement **[NEET-2018]**
(1) Pseudopodia are locomotory and feeding structures in Sporozoans
(2) Mushrooms belong to Basidiomycetes
(3) Cell wall is present in members of Fungi and Plantae
(4) Mitochondria are the powerhouse of the cell in all kingdoms except Monera.

Q.22 Ciliates differ from all other protozoans in **[NEET-2018]**
(1) using pseudopodia for capturing prey
(2) baving a contractile vacuole for removing excess water
(3) using flagella for locomotion
(4) having two types of nuclei

Q.23 Which among the following is not a prokaryote? **[NEET-2018]**
(1) Nostoc (2) Mycobacterium
(3) Saccharomyces (4) Oscillatoria

Q.24 Which of the following statements is incorrect ? **[NEET-2019]**
(1) Viroids lack a protein coat
(2) Viruses are obligate parasites
(3) Infective constituent in viruses is the protein coat
(4) Prions consist of abnormally folded proteins

Q.25 Which of the following statements is incorrect ? **[NEET-2019]**
(1) Morels and truffles are edible delicacies.
(2) Claviceps is a source of many alkaloids and LSD.
(3) Conidia are produced exogenously and ascospores endogenously.
(4) Yeasts have filamentous bodies with long thread-like hyphae.

Q.26 Which of the following is correct about viroids? **[NEET-2020]**

(1) They have free RNA without protein coat
(2) They have DNA with protein coat
(3) They have free DNA without protein coat
(4) They have RNA with protein coat

Q.27 Which of the following statement is correct? **[NEET-2021]**

(1) Fusion of protoplasms between two motile on non-motile gametes is called plasmogamy.
(2) Organisms that depent on living plants are called saprophytes.
(3) some of the organisms can fix atomspheric nitrogen in specialized cells called sheath cells
(4) Fusion of two cells is called Karyogamy.

Q.28 Which of the following is a **correct** statement ? **[NEET-2022]**

(1) Bacteria are exclusively heterotrophic organisms.
(2) Slime moulds are saprophytic organisms classified under Kingdom Monera.
(3) Mycoplasma have DNA, Ribosome and cell wall
(4) Cyanobacteria are a group of autotrophic organisms classified under Kingdom Monera.

Q.29 Which one of the following is not a criterion for classification of fungi? **[NEET-2024]**

(1) Fruiting body
(2) Morphology of mycelium
(3) Mode of nutrition
(4) Mode of spore formation

ANSWER KEY

DPP-1

Q.1 (2) **Q.2** (2) **Q.3** (1) **Q.4** (3) **Q.5** (2) **Q.6** (2) **Q.7** (2) **Q.8** (1) **Q.9** (3) **Q.10** (1)
Q.11 (3) **Q.12** (3) **Q.13** (2) **Q.14** (2) **Q.15** (1) **Q.16** (4) **Q.17** (3)

DPP-2

Q.1 (2) **Q.2** (1) **Q.3** (4) **Q.4** (4) **Q.5** (2) **Q.6** (1) **Q.7** (4) **Q.8** (3) **Q.9** (2) **Q.10** (2)
Q.11 (1) **Q.12** (4)

DPP-3

Q.1 (2) **Q.2** (1) **Q.3** (3) **Q.4** (4) **Q.5** (2) **Q.6** (1) **Q.7** (1) **Q.8** (2) **Q.9** (2) **Q.10** (2)
Q.11 (2) **Q.12** (4) **Q.13** (4) **Q.14** (3) **Q.15** (4)

DPP-4

Q.1 (1) **Q.2** (3) **Q.3** (2) **Q.4** (1) **Q.5** (1) **Q.6** (2) **Q.7** (2) **Q.8** (2) **Q.9** (1) **Q.10** (1)
Q.11 (1) **Q.12** (2) **Q.13** (1) **Q.14** (3) **Q.15** (1)

CLASS ASSIGNMENT

Q.1 (2) **Q.2** (2) **Q.3** (1) **Q.4** (3) **Q.5** (2) **Q.6** (1) **Q.7** (2) **Q.8** (1) **Q.9** (3) **Q.10** (4)
Q.11 (3) **Q.12** (2) **Q.13** (1) **Q.14** (2) **Q.15** (2) **Q.16** (4) **Q.17** (2) **Q.18** (2) **Q.19** (4) **Q.20** (1)
Q.21 (2) **Q.22** (2) **Q.23** (1) **Q.24** (2) **Q.25** (1) **Q.26** (2) **Q.27** (3) **Q.28** (2) **Q.29** (2) **Q.30** (4)
Q.31 (4) **Q.32** (3) **Q.33** (3) **Q.34** (1) **Q.35** (2) **Q.36** (2) **Q.37** (1) **Q.38** (2) **Q.39** (1) **Q.40** (3)

HOME ASSIGNMENT

Q.1 (4) **Q.2** (4) **Q.3** (4) **Q.4** (4) **Q.5** (3) **Q.6** (3) **Q.7** (4) **Q.8** (2) **Q.9** (4) **Q.10** (4)
Q.11 (4) **Q.12** (4) **Q.13** (3) **Q.14** (3) **Q.15** (2) **Q.16** (1) **Q.17** (1) **Q.18** (1) **Q.19** (3) **Q.20** (4)
Q.21 (2) **Q.22** (3) **Q.23** (2) **Q.24** (3) **Q.25** (4) **Q.26** (1) **Q.27** (3) **Q.28** (1) **Q.29** (3) **Q.30** (3)
Q.31 (3) **Q.32** (2) **Q.33** (2) **Q.34** (4) **Q.35** (2) **Q.36** (2) **Q.37** (1) **Q.38** (4) **Q.39** (4) **Q.40** (3)
Q.41 (4) **Q.42** (4) **Q.43** (1) **Q.44** (3) **Q.45** (4) **Q.46** (1) **Q.47** (4) **Q.48** (3) **Q.49** (2) **Q.50** (3)
Q.51 (2) **Q.52** (3) **Q.53** (3) **Q.54** (2) **Q.55** (1) **Q.56** (1) **Q.57** (2) **Q.58** (2) **Q.59** (1) **Q.60** (2)
Q.61 (2) **Q.62** (2) **Q.63** (2) **Q.64** (1) **Q.65** (3) **Q.66** (4) **Q.67** (3) **Q.68** (3) **Q.69** (3) **Q.70** (3)
Q.71 (3) **Q.72** (1) **Q.73** (3) **Q.74** (1) **Q.75** (3) **Q.76** (3) **Q.77** (4) **Q.78** (3) **Q.79** (1) **Q.80** (1)
Q.81 (2) **Q.82** (2) **Q.83** (3) **Q.84** (4) **Q.85** (3) **Q.86** (2) **Q.87** (3) **Q.88** (1) **Q.89** (1) **Q.90** (3)
Q.91 (2) **Q.92** (2) **Q.93** (1) **Q.94** (1) **Q.95** (4) **Q.96** (2) **Q.97** (3) **Q.98** (4) **Q.99** (1) **Q.100** (3)
Q.101 (1) **Q.102** (4) **Q.103** (4) **Q.104** (1) **Q.105** (4) **Q.106** (1) **Q.107** (4) **Q.108** (4) **Q.109** (4) **Q.110** (3)
Q.111 (3) **Q.112** (1) **Q.113** (1) **Q.114** (3) **Q.115** (1) **Q.116** (4) **Q.117** (2) **Q.118** (2) **Q.119** (4) **Q.120** (3)
Q.121 (4) **Q.122** (2) **Q.123** (3) **Q.124** (2) **Q.125** (3) **Q.126** (4) **Q.127** (4) **Q.128** (1) **Q.129** (3) **Q.130** (4)
Q.131 (4) **Q.132** (1) **Q.133** (1) **Q.134** (3) **Q.135** (2) **Q.136** (1) **Q.137** (2) **Q.138** (2) **Q.139** (3) **Q.140** (1)
Q.141 (2) **Q.142** (3) **Q.143** (4) **Q.144** (4) **Q.145** (4) **Q.146** (3) **Q.147** (4) **Q.148** (3) **Q.149** (4) **Q.150** (4)
Q.151 (2) **Q.152** (3) **Q.153** (3) **Q.154** (1) **Q.155** (4) **Q.156** (3) **Q.157** (4) **Q.158** (3) **Q.159** (3) **Q.160** (4)

Q.161 (2) **Q.162** (3) **Q.163** (1) **Q.164** (3) **Q.165** (3) **Q.166** (3) **Q.167** (3) **Q.168** (1) **Q.169** (1) **Q.170** (1)
Q.171 (3) **Q.172** (4) **Q.173** (1) **Q.174** (2) **Q.175** (1) **Q.176** (1) **Q.177** (1) **Q.178** (1) **Q.179** (3) **Q.180** (4)
Q.181 (2) **Q.182** (4) **Q.183** (3) **Q.184** (4) **Q.185** (4) **Q.186** (2) **Q.187** (2) **Q.188** (3) **Q.189** (2) **Q.190** (2)
Q.191 (3) **Q.192** (2) **Q.193** (1) **Q.194** (2) **Q.195** (2) **Q.196** (3) **Q.197** (3) **Q.198** (1) **Q.199** (2) **Q.200** (4)
Q.201 (3) **Q.202** (2) **Q.203** (2) **Q.204** (1) **Q.205** (3) **Q.206** (2) **Q.207** (3) **Q.208** (2) **Q.209** (4) **Q.210** (1)
Q.211 (1) **Q.212** (4) **Q.213** (1) **Q.214** (3) **Q.215** (2) **Q.216** (1) **Q.217** (4) **Q.218** (1) **Q.219** (4) **Q.220** (3)
Q.221 (3) **Q.222** (1) **Q.223** (2) **Q.224** (3) **Q.225** (4) **Q.226** (1) **Q.227** (2)

NEET PREVIOUS YEAR'S

Q.1 (2) **Q.2** (2) **Q.3** (1) **Q.4** (3) **Q.5** (1) **Q.6** (4) **Q.7** (3) **Q.8** (4) **Q.9** (3) **Q.10** (1)
Q.11 (2) **Q.12** (1) **Q.13** (4) **Q.14** (3) **Q.15** (2) **Q.16** (4) **Q.17** (2) **Q.18** (3) **Q.19** (2) **Q.20** (3)
Q.21 (1) **Q.22** (4) **Q.23** (3) **Q.24** (3) **Q.25** (4) **Q.26** (1) **Q.27** (1) **Q.28** (4) **Q.29** (3)