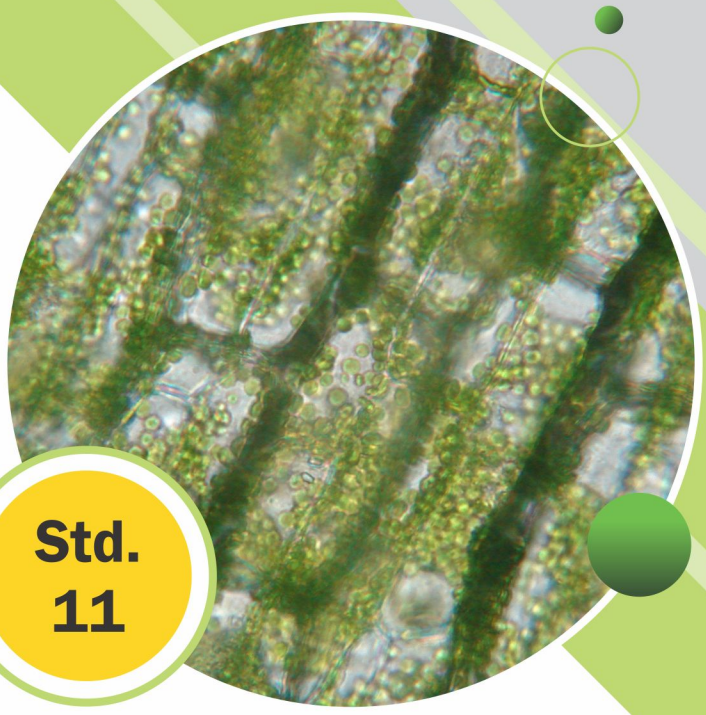
100% KUMAR SUCCESS



Std. 11

As per NCERT Syllabus

BIOLOGY DARPAN

Long & Short Questions - Answers

Objective Questions

MCQs for Competitive Exams

Solution of **NCERT** Exemplar

Solution of **Modules** Questions

QUANTUM CODE

QP22 P11 B1114

Scan QR Code & Get 3 Unique Technology *Absolutely Free*

KUMAR PRAKASHAN KENDRA

₹ 610/-

CREATION WITH PERFECTION IS OUR MOTTO

PAPER GENERATOR FEATURE

With just one click create an exam paper according to the NEW PAPER STYLE without internet

01 SUPER FAST SPEED
Quantum Paper is the only app that allows users to create their own choice exam paper in a matter of seconds.

02 HIGH QUALITY
Teachers can create High Quality Papers for students as the content format is more clear & well organized.

03 4 PAPER SET
4 Paper Set option is also available to ensure that pupils do not copy each other during the exam.

04 OMR SHEET
The exam paper comes with a blank OMR sheet and an OMR sheet with the answer key.

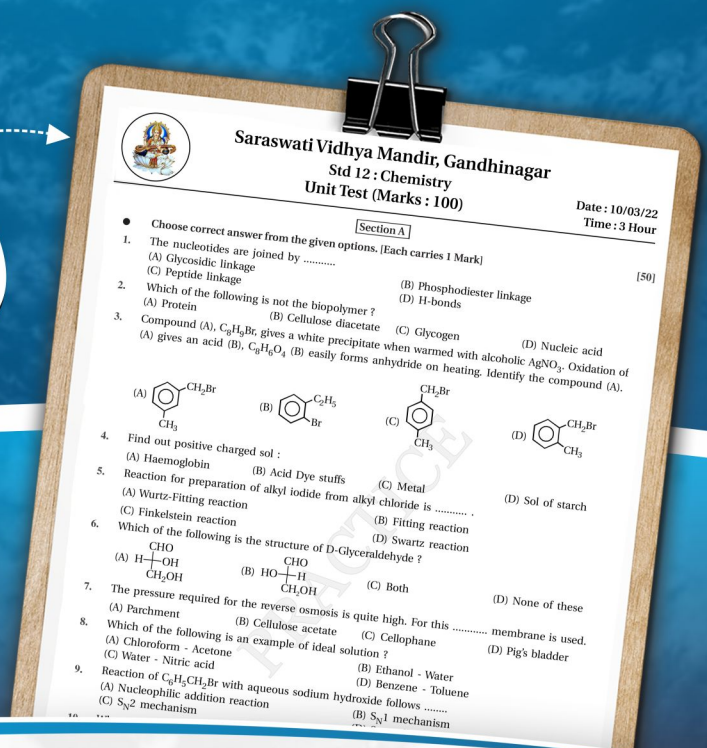
05 CUSTOM MARKS
Changes can be made to both the number of marks and the sequence of questions from different chapters.

06 HEADER-FOOTER & WATERMARK
In the exam paper users can include the name & logo of School/Institute, a watermark, and custom footer.

07 AND/OR OPTIONS
You can add one question in option to another one with (A/A) option & merge two questions with (a+a) option.

08 M' OPTION
The application provides options for selecting questions in accordance with the board's blueprint (any 4 out of 8).

The school or institute's logo will now appear on every exam paper, just like it does on a worksheet.



Saraswati Vidhya Mandir, Gandhinagar
Std 12 : Chemistry
Unit Test (Marks : 100)
Date : 10/03/22
Time : 3 Hour

Section A

• Choose correct answer from the given options. [Each carries 1 Mark] [50]

1. The nucleotides are joined by .....
(A) Glycosidic linkage (B) Phosphodiester linkage
(C) Peptide linkage (D) H-bonds

2. Which of the following is not the biopolymer ?
(A) Protein (B) Cellulose diacetate (C) Glycogen (D) Nucleic acid

3. Compound (A), C_8H_9Br, gives a white precipitate when warmed with alcoholic $AgNO_3$. Oxidation of (A) gives an acid (B), $C_8H_6O_4$ (B) easily forms anhydride on heating. Identify the compound (A).
(A) (B) (C) (D)

4. Find out positive charged sol :
(A) Haemoglobin (B) Acid Dye stuffs (C) Metal (D) Sol of starch

5. Reaction for preparation of alkyl iodide from alkyl chloride is ..... .
(A) Wurtz-Fitting reaction (B) Fitting reaction
(C) Finkelstein reaction (D) Swartz reaction

6. Which of the following is the structure of D-Glyceraldehyde ?
(A) (B) (C) Both (D) None of these

7. The pressure required for the reverse osmosis is quite high. For this ..... membrane is used.
(A) Parchment (B) Cellulose acetate (C) Cellophane (D) Pig's bladder

8. Which of the following is an example of ideal solution ?
(A) Chloroform - Acetone (B) Ethanol - Water
(C) Water - Nitric acid (D) Benzene - Toluene

9. Reaction of $C_6H_5CH_2Br$ with aqueous sodium hydroxide follows .....
(A) Nucleophilic addition reaction (B) S_N1 mechanism
(C) S_N2 mechanism

See Book's Last Page to explore more about 'Worksheet' and 'Student Version' Features

Scan QR Code for more details

Quantum Paper - The Complete Educational App

ONE STOP SOLUTION FOR EVERY STUDENT...

if everything is modernized, then
Why the homework is done in an antiquated manner?

01 EASY, MEDIUM, HARD
From the day one, students will be able to determine questions level (Easy, Medium, Hard) in each Chapter and Section of the books.

02 IMP QUESTIONS
Practicing frequently tested IMP questions will help the students to achieve the highest score in the exam.

03 DAILY PROGRESS
At the fingertips students can get Chapter-wise analysis in Digital Format which will help to identify strong and weak areas.

04 UNIQUE ID
Due to a unique ID for each question, teachers will have quick access to their students' performance on individual questions.

05 HOMEWORK
As there is a time range option for each question, Students will develop the habit of doing homework same like exam.

06 SELF-PRACTICE
With the Customize Line Spacing Option, the Student can select the Questions manually & get the highest score by practicing more.

07 UNIQUE MARKETING
For the First time, School, Institute and teacher will have an access to a treasure chest of Worksheet Templates for Unique Branding.

08 PARENTS' TRUST
By Focusing on the personalized performance of Each Student, The Teacher will be able to win the trust of parents.

WORKSHEET PER DAY...
KEEPS ROUGH WORK AWAY...

Scan QR Code for more details about 'Student Evaluation'

Quantum Paper
+91 95126 94993

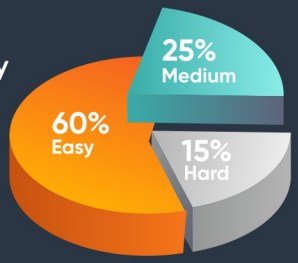
QUANTUM PAPER

World's No.1 & Fastest Paper Generator App
Quantum Paper Presenting...

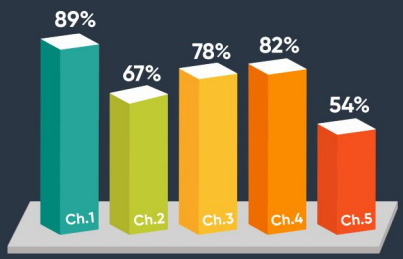
STUDENT VERSION

DIGITAL EVALUATION OF PHYSICAL BOOK

Color-coded Questions makes it Easy to identify the Difficulty Level



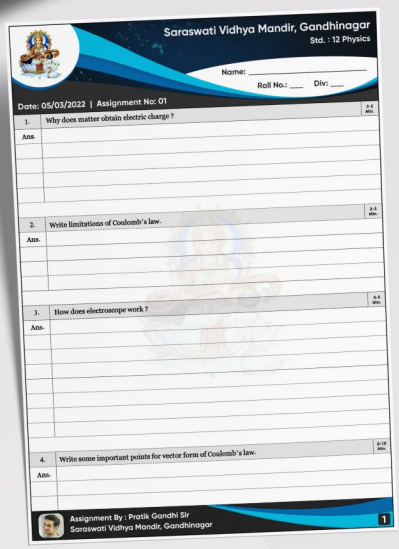
Chapterwise Preparation in Digital Format



Complete Test Paper on Time using Time Range

Quick and easy access to IMP Exam Questions

Teachers & Parents will now be able to view their children's preparation in Real Time



GET APP WITH BOOK 100% FREE...

- Worksheet Feature has altered the notion of Assessment & Homework....
- From the very First Day do Homework in the format of Exam Paper....

Just one Click & get access to treasure of Worksheet Templates

See the Back Page for more Information

Scan QR Code & Download 'Quantum Paper' Application.

KUMAR PRAKASHAN KENDRA

Note : Now Order Books from Kumar Pakashan's website. For More Information : +91 7359662200

info@kumardarpan.com www.kumardarpan.com 079-26562199, 26562200
Nirman Complex, 17-18, Ground Floor, Opp. Havmor, Stadium Circle, Navrangpura, Ahmedabad-9.

978-93-94555-29-7

2 Biological Classification

Section-1 Exam Oriented Questions-Answers From Darpan S1

2.0 Introduction :

1) Mention the contribution of scientists in the early classification. #

➠ Since the time of civilisation there have been many attempts to classify living organisms.

On which criteria early classification was based ?

➠ Classification was done instinctively not using criteria that were scientific but borne out of the need to use organisms for our use - for food, shelter and clothing.

➠ Aristotle was the earliest to attempt a more scientific basis for classification.

➠ Aristotle has used simple morphological characters to classify plants into trees, shrubs and herbs.

How Aristotle classified living organisms ?

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

➠ Linnaeus has developed **Two Kingdom** system of classification with **plantae** and **animalia** that included all plants and animals respectively.

➠ This system was used till very recently.

➠ This system did not distinguish between the eukaryotes and prokaryotes, unicellular and multicellular organisms and photosynthetic (green algae) an non-photosynthetic (fungi) organisms.

Why two system classification is found to be inadequate ?

➠ Classification of organisms into plants and animals was easily done and was easy to understand but a large number of organisms did not fall into either category.

➠ Hence the two kingdom classification used for a long time was found inadequate.

2) Why there was a need of change in classification system ?

➠ A need was felt for including besides gross morphology, other characteristics like cell structure, nature of wall, mode of nutrition, habitat, methods of reproduction, evolutionary relationship etc.

➠ Classification system for the living organisms have undergone several changes over time.

➠ Though plants and animal kingdoms have been a constant under all different system, the understanding of what groups / organisms be included under these kingdoms have been changing the number and nature of other kingdoms have also been understood differently by different scientists over time.

3) What are the drawback / limitations of Two Kingdom classification system.

➠ The two kingdom system of classification was accepted for a long time.

➠ However, some difficulties arised from this classification as several new living organisms have been discovered.

➠ Some of these difficulties are mentioned below :

(i) The first formed organisms were neither plants and animals.

(ii) Fungi do not show similarity with structure, physiology and reproductive system of plants.

(iii) It is not easy to recognise the lower organisms as plants or animals. For example, Euglena has dual mode of nutrition, while sponges are fixed, branched and irregular creatures like plants.

(iv) slime moulds, a group of fungi are wall less in vegetative phase. They develop cell wall in the reproductive phase. Slime moulds can neither be placed in fungi nor plants.

(v) Lichens are formed by the symbiotic association of an alga and fungus. They neither resemble plants nor animals.

(vi) Prokaryotes do not have an organised nucleus. They have single envelope organisation, absence of spindle apparatus, meiosis and sexual reproduction.

➠ Eukaryotes have well - defined nucleus, a double envelop organisation, spindle apparatus, meiosis and sexual reproduction.

➠ On the other hand viruses have no protoplasm and metabolic machinery of their own. Therefore all of these cannot be kept in a single group.

(vii) Unicellular algae like diatoms, euglenoids, dinoflagellates and protozoa resemble each other.

4) Who gave five kingdom classification ? On which criteria it was based and mention its main characteristics or merits ? #

➠ R.H.Whittaker [1969] proposed a five kingdom classification.

➠ The kingdoms defined by him were named Monera, Protista, Fungi, Plantae and Animalia.

➠ The main criteria for classification used by Whittaker :

(i) Cell structure (ii) Mode of nutrition (iii) Thallus organisation (iv) Reproduction (v) Phylogenetic relationships.

➠ Table below gives a comparative account of different characteristics of the five kingdoms.

Five Kingdoms

Characters	Monera	Protista	Fungi	Plantae	Animalia
Cell type	Prokaryotic	Eukaryotic	Eukaryotic	Eukaryotic	Eukaryotic
Cell wall	Noncellulosic (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 (saprophytic / parasitic)	Autotrophic (Photosynthetic) and Heterotrophic	Heterotrophic (Saprophytic/ Parasitic)	Autotrophic (Photosynthetic)	Heterotrophic (Holozoic / Saprophytic etc.)

5) Mention the merits and demerits of five kingdom classification systems. #

- **Merits of five kingdom classification system :** Earlier classification systems included bacteria, blue green algae, fungi, mosses, ferns, gymnosperms and the angiosperms under 'Plants'.
- The character that unified this whole kingdom was that all the organisms included had a cell wall in their cells.
- This placed together groups which widely differed in other characteristics.
- It brought together the prokaryotic bacteria and the blue green algae with other groups which were eukaryotic.
- It also grouped together the unicellular organisms and multicellular ones, example, Chlamydomonas and Spirogyra were placed together under algae.
- Euglena and other transition types which had been included both amongst plants and animals are given proper place under kingdom - Protista.
- Fungi have their own biochemical, physiological and structural organisation. In this system of classification fungi are separately placed.
- All prokaryotic organisms were grouped together under kingdom Monera and the unicellular eukaryotic organisms were placed in kingdom Protista.
- This system shows the gradual evolution of early organisms into plants and animals.
- The plant and animal kingdoms are more homogenous than they were in the two kingdom system of classification.
- **Demerits of five kingdom classification system :** Kingdom Protista has brought together chlamydomonas, chlorella (earlier placed in Algae within plants and both having cell walls) with paramoecium and amoeba (which were earlier placed in the animal kingdom which lack cell wall).

Why there is a change in classification given by Whittaker ?

- It has put together organisms which in earlier classifications were placed in different kingdoms.
- This happened because the criteria for classification changed.
- Yeasts are though unicellular eukaryotes do not belong to kingdom Protista.
- Euglena like organisms and slime moulds with flexible life style may need the creation of an intermediate kingdom of Protista.
- Viruses and viroids are not kept in proper place in this system.

2.1 Kingdom Monera :

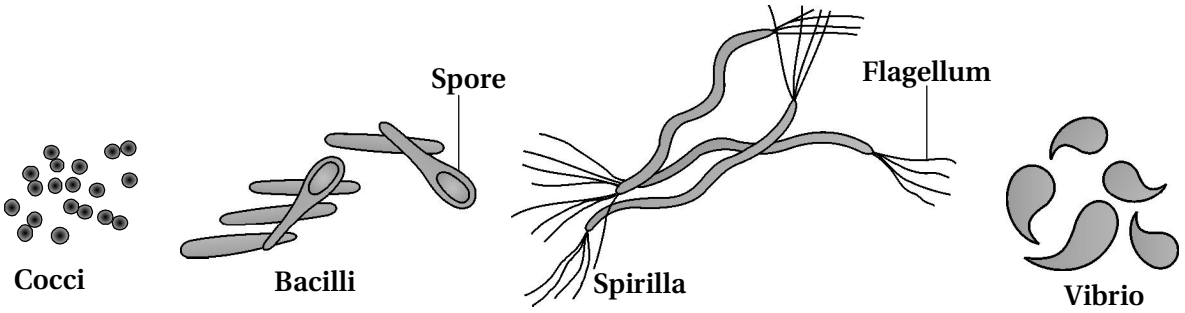
6) State the characteristic features of Kingdom Monera.

- Bacteria are the sole members of the Kingdom Monera.
- **Occurance:** Bacteria are the most abundant microorganisms which occur almost everywhere.
- Hundreds of bacteria are present in a handful of soil.
- They also 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 organism as parasites.

Based on shape of bacteria, name its types.

- **Types based on shape :** Bacteria are grouped under four categories based on their shape.
- The spherical coccus (Pl. Cocci), the rod shaped Bacillus (Pl. bacilli), the comma - shaped Vibrium (Pl. Vibrio) and the spiral Spirillum (Pl. Spirilla).

UID : P1-C2-S1-Q5



Bacteria of different shapes

- **Mode of nutrition :** Though the bacterial structure is very simple they are very complex in behaviour.
- Bacteria show the most extensive metabolic diversity.
- Some of the bacteria are autotrophic i.e. they synthesise their own food from organic substrates.
- They may be Photosynthetic autotrophic or chemosynthetic autotrophic.
- The vast majority of bacteria are heterotrophs i.e. they do not synthesise their own food but depend on other organisms or on dead organic matter for food.

7) Write short note on Archaebacteria. #

How are archae - bacteria different from other bacteria ?

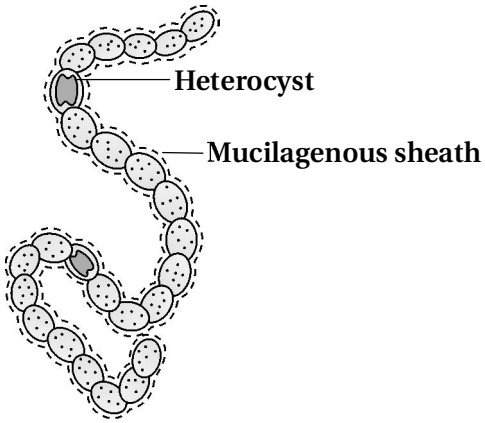
- Archaebacteria are special since they live in some of the harsh habitats such as extreme salty areas (halophiles), hot springs (thermoacidophiles) and marshy areas (methanogens).
- Archaebacteria differ from other bacteria in having a different cell wall structure and this feature is responsible for their survival in extreme conditions.

Where do we find Methanogens ?

- Methanogens are present in the gut of several ruminant animals such as cows and buffaloes and they are responsible for the production of methane (biogas) from the dung of these animals.

8) Write short note on Eubacteria.

- **Eubacteria :** There are thousands of different eubacteria or true bacteria.
- They are characterised by the presence of a rigid cell wall and if motile, a flagellum.
- **Cyanobacteria :** The cyanobacteria (also referred to as blue-green algae) have chlorophyll a similar to green plants and are photosynthetic autotrophs.



A filamentous blue-green algae - Nostoc

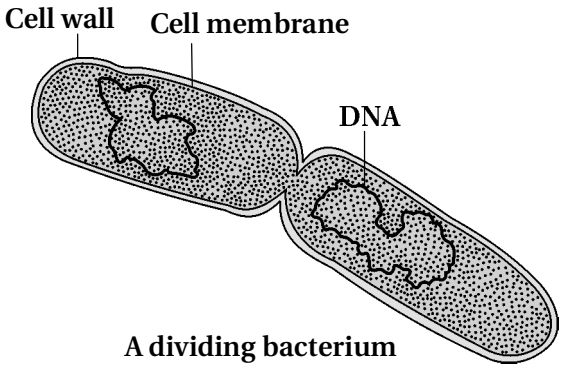
- **Habitat :** The cyanobacteria are unicellular, colonial or filamentous, freshwater / marine or terrestrial algae.
- The colonies are generally surrounded by gelatinous sheath.
- They often blooms in polluted water bodies.
- **Function :** Some of these organisms can fix atmospheric nitrogen in specialised cells called heterocysts eg. Nostoc and Anabaena.

Mention the uses of Chemo-synthetic autotrophic bacteria.

- **Chemosynthetic autotrophic bacteria :** 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 bacteria are the 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 legume roots etc.

Name the diseases caused by eubacteria.

- Some are pathogens causing damage to human beings, crops, farm animals and pets.
- Cholera, typhoid, tetanus, citrus canker are well known diseases caused by different bacteria.
- **Reproduction :** Bacteria reproduce mainly by fission.
- Sometimes under unfavourable conditions they produce spores.
- They also reproduce by a sort of sexual reproduction by adopting a primitive type of DNA transfer from one bacterium to the other.



A dividing bacterium

Write short note on Mycoplasma.

- **Mycoplasma :** The mycoplasma are organisms that completely lack a cell wall.
- They are the smallest living cells known and can survive without oxygen.
- Many mycoplasma are pathogenic in animals and plants.
- Mycoplasma are the simplest free living prokaryotes.
- They are also known as PPLO (pleuropneumonia like organism).

Describe types of Eubacteria.

- **Types of Eubacteria :** Eubacteria are typically classified into five different phylums :
- Chlamydias, cyanobacteria (Blue-green algae), Gram - positive bacteria, proteobacteria and spirochetes.
- Chlamydias are often parasitic bacteria.
- Cyanobacteria are most commonly known to be aquatic and obtain energy via photosynthesis.

- Some, but not all bacteria have an additional layer enclosing the cell wall referred to as the lipopolysaccharide or LPS layers.
- This extra layer cannot be dyed with a gram stain that is often used to classify bacteria by researchers and are thus referred to as Gram negative bacteria or Proteobacteria.
- Proteobacteria make up the second largest group of bacteria and they can be stained by the dye.
- These bacteria are referred to as gram positive.
- Spirochetes are long, thin, spiral shaped bacteria that are known to cause Lyme disease.
- They are distinct from the other types of bacteria due to their helical shape and movement.
- They typically move by spinning along their axis.

2.2 Kingdom Protista :

9) Describe the characteristic features of kingdom protista and also describe its group. #

- All single celled eukaryotes are placed under Protista, but the boundaries of this kingdom are not well defined.
- **Habitat :** Members of Protista are primarily aquatic.
- This kingdom forms a link with the others dealing with plants, animals and fungi.
- **Structure :** Being eukaryotes, the protistan cell body contains a well defined nucleus and other membrane - bound organelles.
- Some have flagella or cilia.
- **Reproduction :** Protists reproduce asexually and sexually by a process involving cell fusion and zygote formations.
- **Member of Protista :** Chrysophytes Dinoflagellates, Euglenoids, Slime moulds and Protozoans are under protista.

10) Explain the characteristic features of group chrysophytes and give its example.

- This group includes diatoms and golden algae (desmids).
- **Habitat :** They are microscopic and float passively in water currents [plankton].
- **Mode of nutrition :** Most of them are photosynthetic.

Describe the body organisation of chrysophytes.

- **Body organisation :** In diatoms the cell wall form two thin overlapping shells, which fit together as in a soap box.
- The walls are embedded with silica and thus the walls are indestructible.
- Thus diatoms have left behind large amount of cell wall deposits in their habitat, this accumulation over billion of years is referred to as “diatomaceous earth”.
- **Function :** Being gritty this soil is used in polishing, filtration of oils and syrups.
- Diatoms are the chief ‘Producers’ in the oceans.

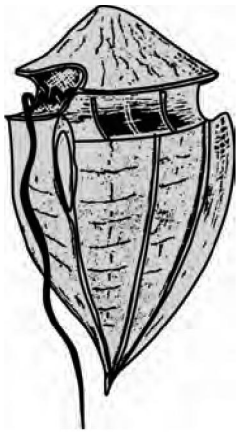
Describe the body organisation of Dino-flagellates .

11) Write the characteristic feature of group Dinoflagellates.

- **Habitat :** These organisms are mostly marine and photosynthetic.
- **Body organisation :** They appear yellow, green, brown, blue or red depending on the main pigments present in their cells.

UID : P1-C2-S1-Q9

- The cell wall has stiff cellulose plates on the outer surface.
- Most of them have two flagella; one lies longitudinally and the other transversely in a furrow between the wall plates.
- **Special features :** Very often 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.
- **Reproduction :** Dinoflagellates reproduce asexually through cell division or by the formation of zoospores and cysts.
- **Reserve food :** Reserve food is stored in the from of starch and oils.



Dinoflagellates

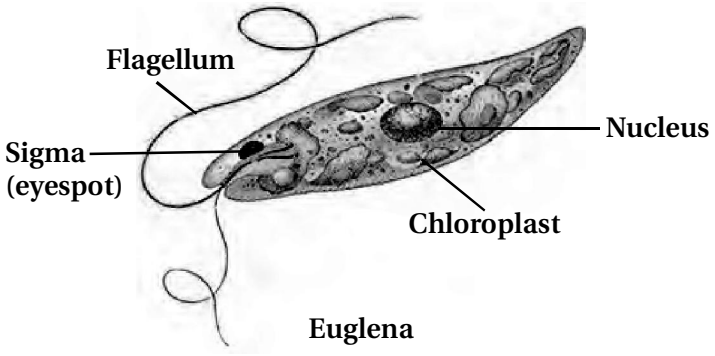
e.g. Gonyaulax, Ceratium, Noctiluco, Peridinium and Gymnodinium etc.

12) Write the general characteristics of Euglenoids. #

- **Habitat :** Majority of them are fresh water organisms found in stagnant waters.
- **Body organisation :** Instead of a cell wall, they have a protein rich layer called pellicle which make their body flexible.
- They have two flagella, a short and long one.

Describe the mode of nutrition in Euglena.

- **Mode of nutrition :** Nutrition is holophytic, saprobic or holozoic. This mode of nutrition is called mixotrophic.
- Though they 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 those present in higher plants.
- The photosynthetic pigments include chlorophyll 'a and b'.
- Prey such as bacteria and smalls flagellates are ingested through a cyclostome, supported by microtubules.
- Reserve food is carbohydrates in the form of paramylon or paramylum bodies.
- **Reproduction :** Euglenoids reproduce by longitudinal binary fission under favourable condition.
- The palmella stage is found during unfavourable condition.
- **Examples :** Euglena, Porenema, Eutreptia, Phacus etc.



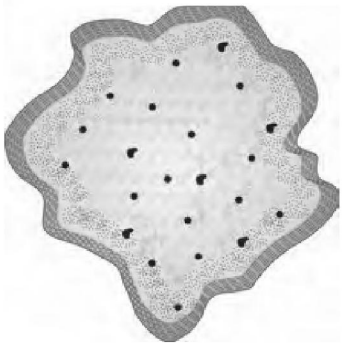
Euglena

13) Write short note on Slime Mould.

- Slime moulds are saprophytic protists.
- The body moves along decaying twigs and leaves engulfing organic material.

What are Plasmodium and what does it form ?

- Under suitable conditions, they form an aggregation called Plasmodium which may grow and spread over several feet.
- 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.
- **Body organisation :** The body of slime moulds is covered with mucilage having gelatinous consistency they do not have chlorophyll.



Slime mould

- They are surrounded by plasma membrane. However, the spores have the cellulosic cell walls.
- **Special features :** Anton De Bary related them to animals and called them as Mycetozoa.
- These are also named as fungus animals because they share the common characters of both animals and are known as protistions fungi and due to their protistian nature.
- They are like protozoa in their amoeboid plasmodial stage and similar to true fungi in spore formation.

Where do we find slime moulds ?

- Acellular slime moulds [Plasmodial slime moulds] are commonly found on dead and decaying plant matter.
- The cellular slime moulds occur in all humas containing upper layer of damp soil.

What is pseudoplasmodium ?

- When the food supply is shorter or conditions are not favourable, the amoeboid cells form aggregate without any fusion.
- This aggregated mass is called pseudoplasmodium.
- The examples of cellular slime moulds are dictyostelium and polysphondylium.
- **Economic importance :** Slime moulds are beneficial as they cause the decomposition of organic matter in the soil.
- **Example :** Physarum, Stemonitis, Comatricha, Trichia.

14) Explain the main features of protozoans and its groups. #

- All protozoans are heterotrophs and live as predators or parasites.
- They are believed to be primitive relatives of animals.
- They were first studied by Leeuwenhoek.
- They can cause several diseases in humans and animals.

✤ **General characteristics of protozoans are described below :**

- They are microscopic small unicellular and colourless organism with different shapes.
- Locomotion occurs with the help of finger like pseudopodia, flagella or hairy cilia.
- Respiration occurs through the general surface of the body.
- Reproduction occurs by binary fission, multiple fission or budding.
- Sexual reproduction occurs by syngamy and conjugation.

✤ **Groups of Protozoans :**

Describe amoeboid protozoans.

- **Amoeboid protozoans :** The organisms live in freshwater, sea water or moist soil.
- They move and capture their prey by putting out Pseudopodia (false feet) as in Amoeba (as mouth is absent).
- Marine forms have silica shells on their surface.
- Nutrition is holozoic.
- Some of them such as Entamoeba are parasites.
- Asexual reproduction occurs by binary fission, multiple fission, spores and budding and sexual reproduction occurs by syngamy.
- **Examples :** Amoeba, Entamoeba, Radiolarians, Pelomyxa, Foraminiferans and Heliozoans.

With the help of examples describe flagellated protozoans.

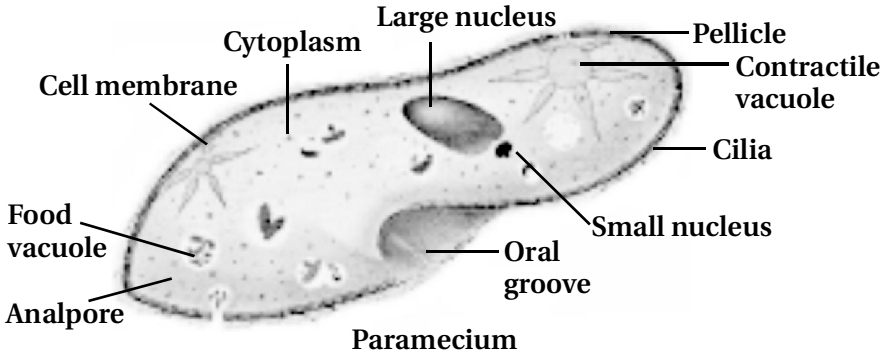
- **Flagellated protozoans :** The members of this group are either free living or parasitic.
- They have flagella for locomotion as their name suggests.
- They may be aquatic, free living parasitic, commensals or symbiotic.
- Nutrition is holozoic, saprobic and parasitic.
- Asexual reproduction is by binary fission.
- Sexual reproduction is observed in some forms only.
- Various species of these protozoans causes diseases in humans. for example :

Name various diseases caused by protozoans.

- Trypanosoma (sleeping sickness)
- Leishmania (kala-agar, dum dum fever)
- Giardia (giardiasis)
- Trichomonas (leucorrhoea)
- **Ciliated protozoans :** These are aquatic, actively moving organisms because of the presence of thousands of cilia.

Describe body organization of ciliated protozoans.

- They have a cavity (gullet) that opens to the outside of the cell surface.
- The coordinated movement of rows of cilia causes the water laden with food to be steered into the gullet.
- Many ciliates live as free living individuals in fresh and marine water (paramecium).
- Nutrition is holozoic except in some parasitic forms.
- The body is covered with flexible pellicle.
- There are definite regions for ingestion and egestion.
- Ciliates have a large macronucleus and smaller micronucleus.
- They have small ejectable trichocyst for defense.
- Osmoregulation occur by contractile vacuoles.
- **Reproduction :** Asexual reproduction occurs by transverse binary fission or budding.
- Cyst formation also occurs during unfavourable condition.
- Sexual reproduction by means of conjugation.
- **Examples :** Paramoecium, Opalina, Vorticella, Podophyra, Balantidium etc.



Paramecium

What are sporozoans ?

- **Sporozoans :** This group includes organisms that have an infectious spore like stage in their life cycle.
- All sporozoans are endoparasites and pathogenic.
- Locomotory organs are absent.
- **Body organisation :** Nutrition is parasitic (absorptive).
- Body is covered with an elastic pellicle or cuticle and contractile vacuoles are absent.
- **Reproduction :** A sexual reproduction occur through multiple fission and sexual reproduction by syngamy.
- Life cycle may include two different hosts eg. plasmodium requires two host (digenetic) female Anopheles mosquito and human beings. It is responsible for causing malaria in human.

2.3 Kingdom - Fungi :

15) Describe Kingdom - Fungi. #

- The Kingdom-Fungi or Mycota constitute a unique kingdom of heterotrophic organisms.
- They show a great diversity in morphology and habitat.
- Mycology is the branch of science that deals with the study of various fungi.
- A scientist having specialisation in the study of fungi is called mycologist.
- **Examples of fungi :**
  (1) When your bread develops a mould or your orange rots it is because of fungi.
  (2) The common mushroom you eat and toadstools are also fungi.
  (3) White spots seen on mustard leaves are due to a parasitic fungus.

Name the disease caused by fungi in plant.

  (4) Some unicellular fungi, e.g. yeast are used to make bread and beer.
  (5) Other fungi cause diseases in plant and animals, wheat rust - causing puccinia is an important example.
  (6) Some are the source of antibiotics e.g. Penicillium.
- **Habitat :** Fungi are cosmopolitan and occur in air, water, soil and on animals and plants.
- They prefer to grow in warm and humid places.
- **Body organisation :** With the exception of yeasts which are unicellular, fungi are filamentous.
- Their bodies consists of long, slender thread - like structure called hypha.

- Fungal hyphae are thin tubular transparent threads or filaments filled with protoplasm are covered by wall.
- The network of hyphae is known as mycelium.
- Some hyphae are continuous tubes filled with multinucleated cytoplasm - these are coenocytic hyphae.
- Other have septate or cross walls in their hyphae.
- The hyphae are of following types found in fungi :

What are Aseptate hyphae ?

(i) **Aseptate hyphae :** In aseptate hyphae cross walls or septae are not formed at the time of nuclear division.

- Such hyphae are multinucleate.
- It is called coenocytic, if mycelium contain aseptate and multinucleate hyphae.

What are septate hyphae ?

(ii) **Septate hyphae :** In this type, cross walls or septae form after the nuclear division.

- The cells may have one, two or many nuclei.
- These have septal pores or cross walls in their hyphae, which allow movement of substances between adjacent cells.
- **Fungal tissue :** In fungi, fungal tissue is formed by interweaving of fungal hyphae called as plectenchyma.
- **Fungal cells :** Fungi are eukaryotic cell.
- A cell wall is present on the outside, made of chitin and polysaccharide.
- They posses all the eukaryotic cell organelles except plastids.
- **Nutrition :** 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.
- **Reproduction :** Reproduction in fungi can take place by vegetative means - fragmentation, fission and budding.
- Asexual reproduction is by spores called conidia or sporangiospores or zoospores and sexual reproduction is by oospores and basidiospores.
- The various spores are produced in distinct structures called fruiting bodies.

State various steps involved in sexual reproduction in fungi.

- The sexual cycle involves the following three steps :
  (i) Fusion of protoplasms between two motile or non-motile gametes called plasmogamy.
  (ii) Fusion of two nuclei called Karyogamy.
  (iii) Meiosis in zygote resulting in haploid spores.
- When a fungus reproduces sexually, two haploid hyphae of compatible mating types come together and fuse.
- In some fungi the fusion of two haploid cells immediately result in diploid cells (2n).
- In other fungi (ascomycetes and basidiomycetes) an intervening dikaryotic stage (n + n, i.e. two nuclei per cell) occurs; such a condition is called dikaryon and the phase is called dikaryophase of fungus.

➠ Later, the parental nuclei fuse and the cells become diploid.

➠ The fungi form fruiting bodies in which reduction division occurs, leading to formation of haploid spores.

16) Describe various classes of Kingdom Fungi. #

➠ The morphology of the mycelium, mode of spore formation and fruiting bodies form the basis for the division of kingdom into various classes.

(A) Phycomycetes :

[Sub. Que. : Describe Phycomycetes.]

➠ **Habitats :** Members of phycomycetes are found in aquatic habitats and on decaying wood in moist and damp places or as obligate parasites on plants.

➠ **Body organisation :** The mycelium is aseptate and coenocytic.

➠ Hyphal wall contains microfibrils consists of cellulose, chitin or both.

Describe asexual reproduction in phyco-mycetes.

➠ **Reproduction :** Asexual reproduction takes place by Zoospores (motile) or by aplanospores (non-motile).

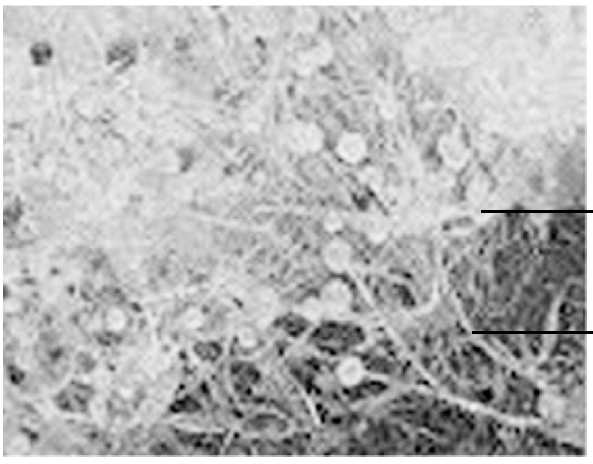
➠ These spores are endogenously produced in sporangium.

➠ A zygospore is formed by fusion of two gametes.

➠ These gametes are similar in morphology (isogamous) or dissimilar (anisogamous or oogamous).

[Sub. Que. : Disease caused by phycomycetes.]

➠ **Example :** Some common examples are Mucor, Rhizopus (the bread mould) and Albugo (The parasitic fungi on mustard). Disease caused by the members of Phycomycetes are white rust (Albugo), late blight of potato (Phytophthora infestans), downy mildew (Hyalo peronospora parasitica) etc.



Mucor

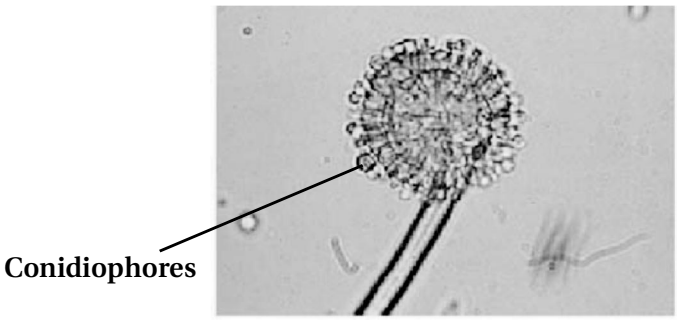
Describe the body organisation of Ascomycetes.

(B) Ascomycetes : Commonly known as Sac-fungi, the ascomycetes are mostly multicellular eg. penicillium, or rarely unicellular eg. yeast (saccharomyces).

➠ **Mode of nutrition :** They are saprophytic, decomposers, parasitic or coprophilous (growing on dung).

➠ **Body organisation :** Mycelium is branched and septate.

- It may consist of distinct hyphae or the some may aggregate to produce prosenchyma (It is formed of distinct hyphae running together in parallel) and pseudoparenchyma (It is false parenchyma formed by close parking and fusion of hyphae).
- **Reproduction :**
- **Asexual reproduction :** The asexual spores are conidia produced exogenously on the special mycelium called conidiophores.
- Conidia on germination produce mycelium.
- **Sexual reproduction :** 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, Claviceps and Neurospora.



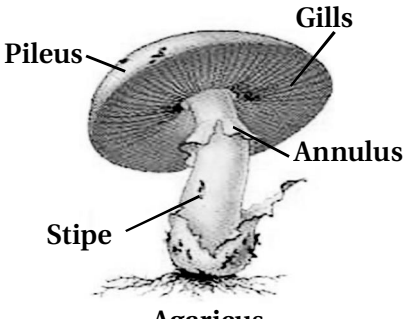
Aspergillus

State the economic importance of Ascomycetes.

- **Economic importance :** Neurospora is used extensively in biochemical and genetic work.
- Many members like morels and truffles are edible and are considered delicacies.

(C) **Basidiomycetes :**

- **Common characters :** Commonly known forms of basidiomycetes are mushrooms, bracket fungi or puffballs.
- **Habitat :** They grow in soil, on logs and tree stumps and in living plant bodies as parasites eg. rusts and smuts.
- **Body organizations :** The mycelium is 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.



Agaricus

- The resultant structure is dikaryotic which ultimately gives rise to basidium.
- Karyogamy and meiosis take place in the basidium producing four basidiospores.

What are basidiocarps ?

- The basidiospores are exogenously produced on the basidium (pl. basidia).
- The basidia are arranged in fruiting bodies called basidiocarps.

Give examples of basidio-mycete.

- **Example :** Agaricus (mushroom), ustilago (smut), puccinia (rust fungus), Amanita (toad stools) bracket fungi, Lycoperdon (puffballs).

(D) Deuteromycetes :

- **Common characters :** Commonly known as imperfect fungi because only the asexual or vegetative phase of these fungi are known.
- When the sexual forms of these fungi were discovered they were moved into classes they rightly belong to.
- It is also possible that the asexual and vegetative stage have been given one name (and placed under deuteromycetes) and the sexual stage another (and placed under another class).
- Later when the linkages were established, the fungi were correctly identified and moved out of deuteromycetes.
- Once perfect (sexual) stages of members of dueteromycetes were discovered they were often moved to ascomycetes and basidiomycetes.
- The deuteromycetes reproduce only by asexual spores known as conidia.

Explain the mode of nutrition in deutero-mycetes.

- The mycelium is septate and branched.
- Some members are saprophytes or parasites while a large number of them are decomposers of litter and help in mineral cycling.
- **Examples :** Alternaria, Colletotrichum and Trichoderma.

2.4 Kingdom Plantae :

17) Write the main characteristics of Kingdom Plantae. #

- Kingdom plantae includes all eukaryotic chlorophyll containing organisms commonly called plants.
- A few members are partially heterotrophic such as the insectivorous plants or parasites.

Give examples of insectivorous plants.

- Bladderwort and Venus fly trap are examples of insectivorous plants and cuscuta is a parasite.
- The plant cells have an eukaryotic structure with prominent chloroplasts and cell wall mainly made of cellulose.
- Plantae includes algae, bryophytes, pteridophytes, gymnosperms and angiosperms.
- **Alternation of generation :** Life cycle of plants has two distinct phases - the diploid sporophytic and the haploid gametophytic that alternate with each other.
- The lengths of the haploid and diploid phase and whether these phases are free living or dependent on others, vary among different groups in plants.
- This phenomenon is called alternation of generation.

2.5 Kingdom Animalia :

18) Write the main characteristics of Kingdom Animalia. #

- Animalia kingdom is characterised by heterotrophic eukaryotic organisms that are multicellular and their cells lack cell walls.
- They directly or indirectly depend on plants for food.
- They digest their food in an internal cavity and store food reserves as 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.
- Higher forms show elaborate sensory and neuromotor mechanism.
- Most of them are capable of locomotion.
- The sexual reproduction is by copulation of male and female followed by embryological development.

2.6 Viruses, Viroids and Lichens :

19) Write short note on viruses.

- All of us who have suffered the ill effects of common cold or 'flu' know what effects viruses can have on us, even if we do not associate it with our condition.

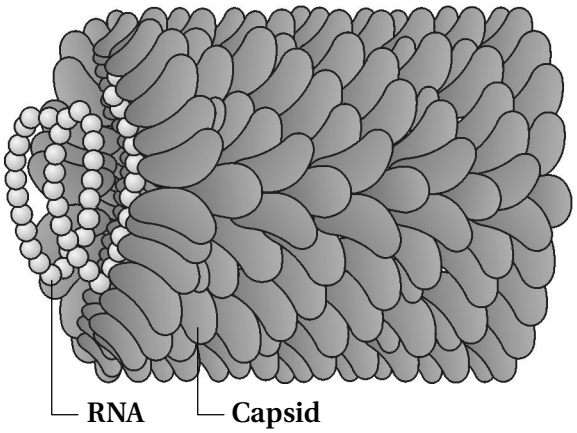
Viruses are living or non-living ?

- Viruses did not find a place in classification since they are not truly 'living'.
- The viruses are non-cellular organisms that have a cell structure.
- The viruses are non-cellular organisms that are characterised 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.

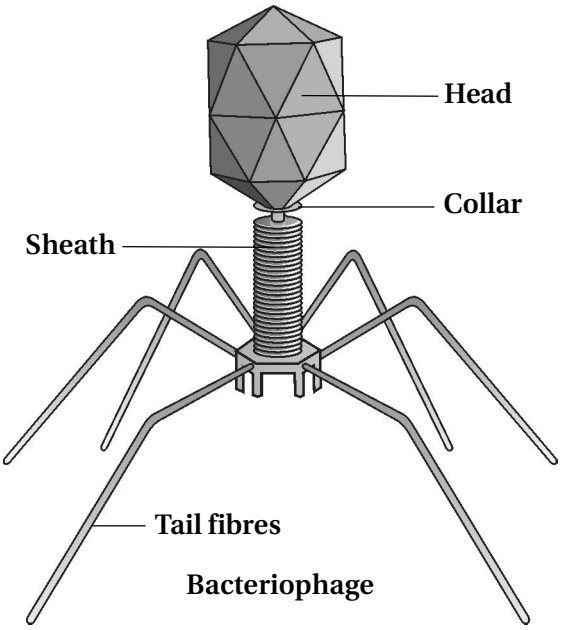
Mention the contribution of various scientist for virus ?

- The name virus that means venom or poisonous fluid was given by Pasteur.
- D. J. Ivanovsky (1892) 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.
- M.W.Beijerinek (1898) 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) showed that viruses could be crystallised and crystals consist largely of proteins.
- They are insert outside their specific host cell.
- Viruses are obligate parasites.
- **Structure :** 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 bacteriophages (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 form.
- **Diseases caused by virus :**
- Viruses cause diseases like mumps, small pox, herpes 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.



Tobacco Mosaic Virus (TMV)



Bacteriophage

20) What are 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 lacked the protein coat that is found in viruses, hence the name viroid.
- The RNA of the viroid was of low molecular weight.

21) Write short note on Lichens.

- Lichens are symbiotic associations i.e. mutually useful associations between algae and fungi.
- The algal components is known as phycobiont and fungal component as mycobiont; which are autotrophic and heterotrophic respectively.
- Algae prepare food for fungi and fungi provide shelter and absorb mineral nutrients and water for its partner.
- So close is their association that if one saw a lichen in nature one would never imagine that they had two different organisms within them.
- Lichens are very good pollution indicators-they do not grow in polluted areas.

Section-2 Difference / Scientific Reasons S2

✤ **Give differences : (2 Marks)**

1) Difference between Three Domains #

Character	Archaea	Bacteria	Eukarya
Cell type Histones	Prokaryotic Have protein similar to histone	Prokaryotic No histone	Eukaryotic Have Histone
Introns	some introns	No introns	must contain introns
Ribosome size	70S ribosomes	70S ribosomes	80S ribosomes
Cell wall	Made of protein (but lack peptido - glycan)	Made of peptido-glycan	Not always present, plants : cellulose, fungi : chitin

2) Eubacteria and Archaebacteria

Eubacteria	Archaebacteria
(1) Cell wall is made up of peptidoglycans.	(1) Peptidoglycan is absent in cell wall. It is made up of cellulosic carbohydrate.
(2) Plasma membrane consists of phospholipids.	(2) It is a single layer of branched chain lipids.
(3) Genes are not interrupted by non-coding zones or introns.	(3) Genes are interrupted by introns like eukaryotes.
(4) Ribosomal proteins and RNA polymerase enzymes are very different from eukaryotes.	(4) Ribosomal proteins and RNA polymerase are similar to eukaryotes.

3) Bacteria and Cyanobacteria

Bacteria	Cyanobacteria
(1) Cell are smaller.	(1) The cells are comparatively larger.
(2) Cell wall is 1-2 layered.	(2) The cell wall is four layered.
(3) They may possess flagella.	(3) They lack flagella.
(4) They are autotrophic and heterotrophic.	(4) They are autotrophic.
(5) Autotrophic bacteria contain bacteria chlorophyll.	(5) They possess chlorophyll as found in eukaryotic autotrophs.
(6) Photosynthesis is anoxygenic.	(6) Photosynthesis is oxygenic.
(7) They may be aerobic or anaerobic.	(7) They are aerobic.
(8) The reserve food is glycogen.	(8) The reserve food is cyanophycean starch.

4) Dinoflagellates and Euglenoids #

Dinoflagellates	Euglenoids
(1) They are mostly marine.	(1) They are freshwater forms found in stagnant water.
(2) They have a cell wall with stiff cellulose plates on the outer surface.	(2) They have no cell wall but pellicle which give shape and flexibility in body.
(3) They are always photoautotrophic.	(3) They may be photoautotrophic or heterotrophic.
(4) They have two flagella-one transverse and one longitudinal.	(4) They have two flagella and both are anterior.

5) Monera and Protista

Monera	Protista
(1) Cell wall is made up of peptidoglycan.	(1) It is made up of cellulose.
(2) Respiratory apparatus is present in respiratory membrane.	(2) It is present in mitochondria.
(3) Ribosomes are 70S types.	(3) Ribosome are 80S types.
(4) These are prokaryotic and have naked circular DNA.	(4) Eukaryotic, linear DNA is present in nucleus.
(5) Extra chromosomal DNA is present in the form of plasmid.	(5) Extra chromosomal DNA is present in organelles like mitochondria and chloroplast.

6) Ascocarp and Basidiocarp

Ascocarp	Basidiocarp
(1) It is fructification found in Ascomycetes.	(1) It is a fructification found in Basidio-mycetes.
(2) It is simpler in construction.	(2) It is more elaborate in construction.
(3) Ascocarp contain numerous asci.	(3) Basidiocarp contain several basidia.
(4) Ascus is generally aseptate.	(4) Basidium maybe septate or aseptate.
(5) An ascus forms eight ascocarps.	(5) A basidium produces four basidiospores.
(6) They are formed endogenously.	(6) They are formed exogenously.

7) Phycomycetes and Ascomycetes

Phycomycetes	Ascomycetes
(1) Hyphae are aseptate and coenocytic.	(1) Hyphae are septate and branched.
(2) Asexual spores are zoospores.	(2) Asexual spores are conidia.

❖ **Give scientific reasons : (2 Marks)**

8) The phylogenetic relationship is useful as a criterion for classification. #

➠ Phylogeny is the evolutionary history of an organism. It shows the true kind of relationship in organism. This relationship are not clear in all cases. We can get some information from fossil record but it is not enough. Hence the phylogenetic relationships are ascertained from morphology, cytology, genetics, physiology and biochemistry for correct classification of the organisms.

9) Diatoms are called pearls of ocean.

➠ Diatoms have a shining silicate two valved covering or frustule, because of this distinctive cell walls these are sometimes called pearls of ocean.

10) Euglena is also called plant animal.

➠ Euglena is a taxonomic puzzle since, it show both plant and animal characters. Absence of cell wall is an animal feature and presence of chloroplast is a plant character of Euglena. They also have mixotrophic nutrition. In the presence of sunlight, they can photosynthesis their food and in absence of sunlight they are heterotrophs by predating other smaller organisms.

11) Lichens play important role in biological succession and soil formation.

➠ Lichens growing on rock secrete organic acid like oxalic acid. This acid enter the rock and produce a number of crevices. Dust and organic matter collect in the crevices. Mass spores are able to grow over such crevices and start the process of succession and soil formation.

12) The members of class - Deuteromycetes are considered the fungi imperfecti.

➠ Deuteromycetes is an artificial class of fungi which has been created to include all these fungi on which sexual stage is either absent or not known. Their mycelium is usually septate. Coenocytic forms are not known.

13) Slime moulds are called fungus animals.

➠ Slime moulds possess the characters of both animals and fungi. Therefore they are commonly called fungus animals. Modern biologists called them protistan fungi. They are like protozoa in their amoeboid plasmodial stage and similar to true fungi in spore formation.

14) Chrysophytes are considered as the chief producers in the ocean.

➠ Organisms like diatoms and desmids are called chrysophytes. They are found in both marine and freshwater form and constitute the major phytoplanktons. Therefore they are the chief producers in the oceans.

Section-3 Definition / Explanation - terms / Full Name / Importance / Contribution of Scientists S3

❖ **Definitions / Explanation : (1 Mark)**

1) **Paramylon :** These are found in euglenoids. These are the products of photosynthesis which can be stored in the cytoplasm.

2) **Pseudoplasmodia :** These are found in slime moulds. Pseudoplasmodia are formed when the food supply of the medium is exhausted.

UID : P1-C2-S2-Q8

3) **Heterocysts :** Present in cyanobacteria. They are the sites of nitrogen fixation. #

4) **Sac fungi :** The members of Ascomycetes are commonly called as sac fungi. They are mostly multicellular.

5) **Conidiophores :** In Ascomycetes the asexual spores are conidia, produced exogenously on the special mycelium called conidiophores. Conidia on germination produced mycelium.

6) **Ascocarp :** In Ascomycetes, sexual spores are called ascospores endogenously which are produced in sac like. The asci are arranged in different types of fruiting bodies called ascocarps.

7) **Clubfungi :** Basidiomycetes are terrestrial saprophytic and parasitic forms also known as clubfungi.

8) **Capsid :** It is a protein covering around the genetic material. Capsid has protein subunits called capsomeres.

9) **Plasmogamy :** Fusion of protoplasms between two motile or non-motile gametes are called plasmogamy.

10) **Karyogamy :** Fusion of two nuclei is called karyogamy.

❖ **Full Name : (1 Mark)**

11) **PPLO :** Pleuropneumonia Like Organisms.

12) **MLO :** Mycoplasma Like Organisms.

13) **VAM :** Vesicular Arbuscular Mycorrizal.

14) **SCP :** Single Cell Protein

15) **TMV :** Tobacco Mosaic Virus.

❖ **Importance : (1 Mark)**

16) **Cyanobacteria :** They have ability to fix atmospheric nitrogen. Cyanobacteria like Anabaena, Tolypothrix etc. help in prevention of soil erosion and conservation. Spirulina is a protein rich supplement for human.

17) **Diatoms :** Are very important photosynthesizers. Diatomite deposit are often accompanied by petroleum fields. These are used as a cleaning in tooth pastes and metal polishes.

18) **Slime moulds :** These are beneficial as they cause the decomposition of organic matter in the soil.

19) **Neurospora :** It is used extensively in biochemical and genetic work.

20) **Lichens :** Lichens contain a complex carbohydrate called lichenin. Hence many lichens are food for many animals. They are useful in producing medicines. Lichens like Roccella tinctoria, Parmelia, Omphalodes are used in making different types of dyes.

21) **Bacteria :** They are natural scavengers. They are used in fermentation process. The genus Streptomyces has many species used to produce different antibiotics.

22) **Methanogens :** They produce almost 65% of atmospheric methane.

❖ **Contribution of Scientists : (1 Mark)**

23) **Aristotle :** The earliest to attempt a scientific basis of classification. He used simple morphological characters to classify plants as trees, shrubs and herbs. He also classified animals into two groups i.e. anaima [With red blood] and anaima [Without red blood]. #

24) **Linnaeus :** (The father of taxonomy system) divided all the living organisms into two Kingdoms in 1758.

25) **R. H. Whittaker :** Five Kingdom classification system was given by him in 1969.

26) **Carl Woese :** Gave three domain system as in it organisms are classified into three domains i.e. Archaea, Bacteria and Eukarya.

27) **Ehrenberg :** The term Bacteria was proposed by Ehrenberg in 1829.

28) **Anton Van Leeuwenhoek :** Bacteria were discovered by Anton Von Leeuwenhoek. He observed bacteria in 1675.

29) **Louis Pasteur :** He laid the foundation of Bacteriology by developing culture techniques.

30) **Pasteur :** The name virus was given by Pasteur [Virus - venom or Poisonous fluid]

31) **D.J. Ivanowsky (1892) :** Recognised certain microbes as causative organism of the mosaic disease of tobacco.

32) **M. W. Beijerinek (1898) :** Demonstrated that the extract of the injected plants of tobacco could cause infection in healthy plant and called the fluid as contagium vivum fluidum [infectious living fluid].

33) **W. M. Stanley (1935) :** Showed that viruses could be crystallised and crystals consist largely of proteins.

34) **T. O. Diener (1971) :** Discovered viroids a new infectious agent that was smaller than viruses and caused potato spindle tuber disease.

Section-4 Textual Exercise S4

1) Discuss how classification systems have undergone several changes over a period of time ?

➠ Changes in classification system over a period of time, more criteria for classification were implemented based on observable morphological features.

➠ These criteria are habitat, cell structure, nature of cell wall when present, mode of nutrition and reproduction, evolutionary relationships.

➠ Prokaryotes have been kept as separate kingdom called Monera.

➠ Eukaryotes (single - celled) have been separated in kingdom - Protista.

2) State two economically important uses of :

(a) heterotrophic bacteria (b) archaebacteria

➠ **(a) heterotrophic bacteria :**

(i) Bacteria are natural scavengers. They obtain their nutrition by decomposing dead bodies, dead plants and animal excreta.

(ii) These are used in fermentation process for vinegar manufacturing, yogurt making etc.

UID : P1-C2-S3-Q23

(iii) Some bacteria help in retting of jute and coconut plant fibres.

(iv) The genus streptomyces has many species used to produce different antibiotics.

(v) Bacteria play important role in different steps of nitrogen cycle.

(b) archaebacteria :

➠ Archaebacteria can live in extreme environments so they are useful in :

(i) Modern biotechnology

(ii) Generation of biogas

(iii) Thermophilic enzyme

(iv) Biosensors

(v) Restriction enzymes

3) What is the nature of cell walls in diatoms ? #

➠ The cell walls of diatoms are made of silica.

➠ Their cell wall construction is known as frustule.

➠ It consists of two thin overlapping shells that fit into each other such as a soap box.

➠ When the diatoms die, the silica in their cell wall gets deposited in the form of diatomaceous earth.

➠ This diatomaceous earth is very soft and quite inert.

➠ It is used in filtration of oils, sugars and for other industrial purposes.

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

➠ Algal bloom refers to the excessive growth of algae, especially cyanobacteria in polluted waters.

➠ Red tides refer the red colour imparted to the sea water by the rapid multiplication of dinoflagellates like Gonyaulax.

5) How are viroids different from viruses ?

Viroids	Viruses
(1) Protein coat is absent.	(1) Protein coat is present.
(2) RNA is small.	(2) RNA is comparatively large .
(3) These are short segment of free RNA which are infectious.	(3) The genetic / infectious material is RNA or DNA.

6) Describe briefly the four major groups of protozoa.

➠ For answer see section-1, Q. No. 14

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

➠ Plants are generally autotrophic.

➠ However some plants like Nepenthes (pitcher plant), utricularia (bladderwort), Venus fly trap and some parasites like cuscuta are example of partially heterotrophic plants.

➠ They supplement their nitrogen requirement by capturing and digesting insects.

8) What do the terms phycobiont and mycobiont signify ?

➠ Phycobiont refers to the algal component of the lichens and mycobiont refers to the fungal component.

➠ Algae contain chlorophyll and prepare food for fungi whereas the fungus provides shelter to algae and absorbs water and nutrients from the soil.

➠ This type of relationship is referred to as symbiotic.

9) Give a comparative account of the classes of kingdom fungi under the following : (i) mode of nutrition (ii) mode of reproduction. #

		Phycomycetes	Ascomycetes	Basidiomycetes	Deuteromycetes
(1)	Mode of nutrition	They are obligate parasites on plants or are found on decaying matter such as wood.	They are saprophytic decomposers, parasitic or coprophilous (growing on dung).	They grow as decomposers in soil or on logs and tree stumps. They also occur as parasites in plant causing diseases such as rusts and smuts.	Some members are saprophytes while others are parasites. A large number but as decomposers of leaf litter.
(2)	Mode of reproduction	Asexual reproduction takes place through motile zoospores or non-motile aplano-spores that are produced endogenously in sporangium. Sexual reproduction may be of isogamous, anisogamous or oogamous type. It results in the forma-tion of thick - walled zygospore.	Asexual reproduction occurs through asexual spores produced exogenously. Such as conidia produced on conidiophores. Sexual reproduction takes place through ascospores produced endogenously in sac-like asci and arranged inside ascocarps.	Asexual reproduction takes place commonly through fragmentation. Asexual spores are absent. Sex organ are absent but sexual reproduction takes place through plasmogamy. It involves fusion of two different strains of hyphae. The resulting dikaryon gives rise to a basidium. Four basidiospore are produced inside a basidium.	Asexual reproduction is the only way of reproduction in deuteromycetes. It occurs through asexual spores called conidia. Sexual reproduction is absent in deuteromycetes.
(3)	Examples	Rhizopus, Albugo etc.	Penicillium, Aspergillus, Claviceps and Neurospora.	Ustilago, Agaricus Puccinia.	Alternaria, Trichoderma and Colletotrichum.

10) What are the characteristic features of Euglenoids ? #

➠ For answer see section-1, Q. No. 12

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

➠ Viruses are sub microscopic infectious agents that can infect all living organisms.

➠ A virus consists of genetic material surrounded by a protein coat.

➠ The genetic material may be present in the form of DNA or RNA.

➠ Most of the viruses, infecting plants, have single stranded RNA or genetic material.

➠ On the other hand, the viruses infecting animals have single or double stranded RNA or double stranded DNA.

➠ Bacteriophages or viruses infecting bacteria mostly have double stranded DNA.

➠ Their protein coat called capsid is made up of subunits of capsomere.

➠ These capsomere are arranged in helical or polyhedral geometric forms.

➠ AIDS, small pox, mumps and influenza are some common examples of viral diseases.

12) Organise a discussion in your class on the topic - Are viruses living or non-living ?

➠ Viruses are microscopic organisms that have characteristics of both living and non-living.

➠ A virus consists of a strand of DNA or RNA covered by a protein coat.

➠ This presence of nucleic acid (DNA or RNA) suggests that viruses are alive.

➠ In addition, they can also a respond to their environment (inside the host cell) in a limited manner.

➠ However, some other characters, such as their inability to reproduce without using the host cell machinery and their acellular nature indicate that viruses are non-living.

➠ Therefore, classifying viruses has remained as mystery for modern systematics.

Solution of NCERT Exemplar

✤ Multiple Choice Questions : (MCQs) S5

1) All eukaryotic unicellular organisms belong to

(A) Monera (B) Protista

(C) Fungi (D) Bacteria

Ans. (B) Protista

➠ Protista is a group of all unicellular eukaryotic plants and animals. The organisms included in this group are either photoautotrophs, heterotrophs or parasites. On the other hand.

➠ **Monera** includes prokaryotic like bacteria, unicellular organism.

➠ **Fungi** are eukaryotic but are mostly multicellular (exception yeast is unicellular).

2) The five kingdom classification was proposed by

(A) R.H. Whittaker (B) C. Linnaeus

(C) A. Roxberg (D) Virchow

Ans. (A) R.H. Whittaker

➠ In order to develop phylogenetic classification, R.H. Whittaker (1969) divided all the organisms into five kingdoms on the basis of complexity of cell structure, body structure, mode of nutrition, ecological lifestyle and phylogenetic relationships.

➠ Whittaker's five kingdoms are Monera, Protista, Fungi, Plantae and Animalia.

3) Organisms living in salty areas are called as

(A) methanogens (B) halophiles

(C) heliophytes (D) thermoacidophiles

Ans. (B) halophiles

➠ Halophiles are organisms that live in areas of high concentration of salts. The name halophiles

UID : P1-C2-S4-Q10

is originated from the greek word that means 'salt loving'.

➠ Whereas heliophytes are the plants that grow best in sunlight and can not survive in salty conditions.

➠ Methanogens are the bacteria that produces methane as a metabolic by products in anaerobic conditions.

➠ Thermoacidophiles are archaebacteria striving under strong acidic environments and high temperatures, but can not tolerate high salt concentrations around them.

4) Naked cytoplasm, multinucleated and saprophytic are the characteristics of #

(A) Monera (B) Protista

(C) Fungi (D) Slime moulds

Ans. (D) Slime moulds

5) An association between roots of higher plants and fungi is called

(A) Lichen (B) Fern

(C) Mycorrhiza (D) BGA

Ans. (C) Mycorrhiza

➠ Mycorrhiza is the symbiotic association of fungus with roots of a higher plants like gymnosperms and angiosperms.

➠ The fungus is dependent on plants for food and shelter, while the plants are benefitted by the fungal hyphae as they are involved in absorption of water and dissolved minerals present in the soil debris and makes it available to the plants.

➠ Whereas lichens are the symbiotic association between algae and fungi. Ferns are group of plants, belong to pteridophytes like other vascular plants and BGA is blue-green algae with a prokaryotic cell.

6) A dikaryon is formed when

(A) meiosis is arrested

(B) the two haploid cells do not fuse immediately

(C) cytoplasm does not fuse

(D) None of the above

Ans. (B) the two haploid cells do not fuse immediately

➠ Dikaryon is a stage/phase of a cell, in which, there are two nuclei. This condition arises, if fusion of cytoplasm (plasmogamy) is not immediately followed by fusion of nuclei (karyogamy). Karyogamy is delayed, it occurs just before meiosis. Dikaryon occurs in stage intervening between plasmogamy and karyogamy. Such cells are called dikaryotic cells and the phase is called dikaryophase.

7) Contagium vivum fluidum was proposed by

(A) D.J. Ivanovsky (B) M.W. Beijerinek

(C) Stanley (D) Robert Hook

Ans. (B) M.W. Beijerinek

➠ M.W. Beijerinek proposed contagium vivum fluidum means contagious living fluid. This phrase was first used to describe virus, characteristic in escaping from the finest mesh available.

➠ D.J. Ivanovsky was a Russian Botanist who discovered the filterable nature of viruses and one of the founder of virology.

➠ Stanley Miller was a Jewish American chemist experimented on origin of life.

➠ Robert Hook was the first to study and record cells using his primitive micropscope.

8) Association between mycobiont and phycobiont are found in

(A) mycorrhiza (B) root

(C) lichens (D) BGA

Ans. (C) lichens

➠ Lichens are symbiotic association between fungus (mycobiont) and alga (phycobiont). The mycobiont is usually an ascomycete and phycobiont is mostly blue green alga or green alga. Lichens can grow in extremely inhospitable conditions. In many ecosystems they are the pioneer species. The role of mycobiont is to provide body structure, anchorage to plant and absorption of minerals and water. Phycobiont provides food to fungus through photosynthesis.

9) Difference between virus and viroid is

(A) absence of protein coat in viroid, but present in virus.

UID : P1-C2-S5-Q4

(B) presence of low molecular weight RNA in virus, but absent in viroid,

(C) Both (A) and (B)

(D) None of the above

Ans. (A) absence of protein coat in viroid, but present in virus.

➠ Virus contains DNA or RNA as genetic material and a protein coat, whereas viroids have no protein coat, but only RNA as their nucleic acid. This is the reason why viroids are carried inside viruses. e.g. hepatitis-D is a viroid that is carried in the capsid of hepatitis-B virus.

10) With respect to fungal sexual cycle, choose the correct sequence of events. #

(A) Karyogamy, Plasmogamy and Meiosis

(B) Meiosis, Plasmogamy and Karyogamy

(C) Plasmogamy, Karyogamy and Meiosis

(D) Meiosis, Karyogamy and Plasmogamy

Ans. (C) Plasmogamy, Karyogamy and Meiosis

➠ In fungi, sexual reproduction involves the formation and union of two gametes or their nuclei. Fusion of gametes involves union of cytoplasm called plasmogamy and fusion of nuclei, known as karyogamy. Plasmogamy is followed by karyogamy but in higher fungi karyogamy is delayed and it occurs before meiosis. Therefore, the correct sequence in sexual reproduction of fungal life cycle is plasmogamy, karyogamy and meiosis.

11) Viruses are non-cellular organisms, but replicate themselves once they infect the host cell. To which of the following kingdom do viruses belong to ?

(A) Monera (B) Protista

(C) Fungi (D) None of these

Ans. (D) None of these

➠ In five kingdom classification of Whittaker, non-cellular organisms like viruses and viroids are not mentioned. Viruses did not find a place in classification since they are not truly 'living' and hence, they are considered as non-cellular.

➠ Monera includes all unicellular prokaryotes called bacteria in which viruses can not be included.

➠ Protista includes all eukaryotic unicellular plant and animals and fungi are heterotrophic/ parasitic cellular organism devoid of chlorophyll.

12) Members of Phycomycetes are found in :

(i) Aquatic habitats

(ii) On decaying wood

(iii) Moist and damp places

(iv) As obligate parasites on plants.

Choose form the following options.

(A) (i) and (iv)

(B) (ii) and (iii)

(C) All of these

(D) None of these

Ans. (C) All of these

➠ Phycomycetes is the group of fungi which is characterized by aseptate and coenocytic mycelium. They can live in a wide variety of habitat. They can be aquatic or saprotrophic or parasitic or could be living in moist and damp places. Some examples of phycomycetes are Rhizopus (black bread mould), Mucor (dung mould), Albugo (parasitic fungi).

✤ Very Short Answer Type Questions : (VSQs) S6

1) What is the principle underlying the use of cyanobacteria in agricultural fields for crop improvement ?

➠ Some cyanobacteria live in mutually beneficial relationship with plants obtaining food and shelter and fixing nitrogen for the plant. They also reduce soil alkalinity and improve soil texture.

➠ Nostoc, Anabaena and Oscillatoria are (BGA) Blue - green algae that can fix atmospheric nitrogen.

➠ In paddy fields cyanobacteria serve as an important biofertiliser.

➠ BGA also add organic matter to the soil and increase its fertility.

2) Suppose you accidentally find an old preserved permanent slide without a label. In your effort to identify it, you place the slide under microscope and observe the following features :

(a) Unicellular (b) Well defined nucleus

UID : P1-C2-S5-Q10

(c) Biflagellate - one flagellum lying longitudinally and the other transversely.

What would you identify it as ? Can you name the kingdom it belongs to ? #

➠ According to the listed features, the organism must be a dinofla gellate. Dinoflagellates are unicellular eukaryotes belogs to the kingdom protista.

3) How is the five kingdom classification advantageous over the two kingdom classification ?

➠ In two kingdom classification many unrelated organisms were kept under the same kingdom.

➠ The two kingdom system of classification organisms divided into Plantae and Animalia. On the other hand the five kingdom classification is based upon more specific characters like-cell structure, body structure, nutrition, evolutionary relationships etc.

4) Polluted water bodies have usually very high abundance of plants like Nostoc and Oscillitoria. Give reasons.

➠ Some cynobacteria or blue green algae like Nostoc and Oscillitoria can tolerate adverse conditions including pollutants very well as compared to other aquatic plants. This is due to the presence of mucilage covering, resistant proteins and absence of sap vacuoles. They release large quantity of spores which are always remain present in air. These organisms get plenty of nutrients in polluted water. Hence, they often bloom in such conditions and are found in abundance in polluted water.

5) Are chemosynthetic bacteria autotrophic or heterotrophic ?

➠ Chemosynthetic bacteria are autotrophic because they can synthesize their own food. During chemosynthesis it uses chemicals as source of energy.

6) The common name of pea is simpler than its botanical (scientific) name Pisum sativum. Why then is the simpler common name not used instead of the complex scientific/ botanical name in biology ?

➠ The common name 'Pea' is a English word and this can have different names in different languages. It is easier to remember a standard scientific name as compared to so many names. Hence, instead of using simple common names; it is preferred to use scientific names which may appear complicated but universally accepted.

7) A virus is considered as a living organism and an obligate parasite when inside a host cell. But virus is not classified along with bacteria or fungi. What are the characters of virus that are similar to non-living objects ?

➠ Characters of virus that are similar to non-living objects.

(a) They have inert crystalline structure outside the living cell.

(b) They do not have any cell organelles.

8) In the five kingdom system of Whittaker, how many kingdoms are eukaryotes ?

➠ In the five kingdom - system of Whittaker four kingdoms as eukaryotes which are as follow :

(a) Protista (b) Fungi (c) Plantae (d) Animalia

✤ Short Answer Type Questions : S7

1) Diatoms are also called as 'Pearls of Ocean', why ? What is diatomaceous earth ?

➠ Diatoms have a shining silicified two valved covering or frustule, because of their distinctive cell walls these are sometimes called the pearls of ocean.

➠ **Diatomaceous earth :** It is pile of siliceous skeletons of diatoms which accumulates being resistant to decay.

➠ Diatomaceous earth is gritty in nature and hence is used for polishing and in filtration of oils and syrups.

2) There is a myth that immediately after heavy rains in forest, mushrooms appear in large number and make a very large ring or circle, which may be several metres in diameter. These are called as "fairy rings". Can you explain this myth of fairy rings in biological terms ? Discuss the mycilial structure in Agaricus and its soil borne nature.

➠ The fairy rings form as the mycelium of the mushroom fungus spreads in the soil from a central point.

- It grows peripherally, so that the younger hyphae will appear almost in a circle.
- The mycelium of mushrooms absorbs nutrients from the ground.
- When nutrients at the centre get exhausted they grow in diameter and form a circle.
- The ring grows in diameter every year which are actually fruiting bodies of the fungus.
- This is called 'Fairy Ring' especially in Europe.

3) Neurospora an ascomycetes fungus has been used as a biological tool to understand the mechanism of plant genetics much in the same way as Drosophila has been used to study animal genetics. What make Neurospora so important as genetic tool ? #

- Neurospora (Pink bread mould) is often called Drosophila of plant kingdom.
- It is haploid in nature and every mutation can express immediately.
- Several characteristic of this organism make it ideal to be used for genetic studies.
- **Some of these features are following :**
  - (a) Reproduces quickly
  - (b) Easy to culture
  - (c) Can survive on minimum media.

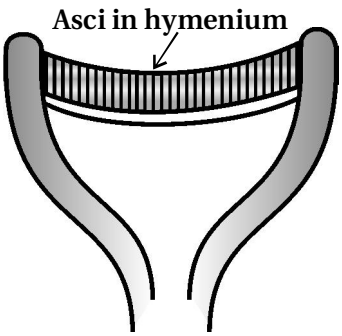
4) Cyanobacteria and heterotrophic bacteria have been clubbed together in eubacteria of kingdom-Monera as per the "five kingdom classification" even though the two are vastly different from each other. Is this grouping of the two types of taxa in the same kingdom justified ? If so, why ? Discuss the cellular composition of cyanobacteria and heterotrophic bacteria that make them introduced in eubacteria.

- All the prokaryotes have been kept under the kingdom Monera. Both cyanobacteria and heterotrophic bacteria are prokaryotes and hence are being kept under the same kingdom. Mode of nutrition is the major difference between cyanobacteria and heterotrophic bacteria. So, this classification is justified.

5) At a stage of their cycle ascomycetes fungi produce the fruiting bodies like apothecium, perithecium or cleistothecium. How are these three types of fruiting bodies different from each other ? Discuss the type of fruiting bodies formed by ascomycetes fungus and differentiate accordingly on the basic of there structures.

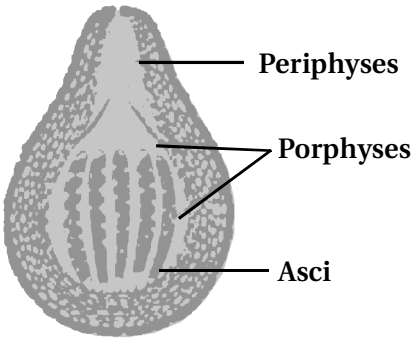
- The fruiting bodies of Ascomycetes are called ascocarps. A fertile layer called hymenium bears asci. These fruiting bodies are different than each other in following ways.

(i) **Apothecium :** Cup shaped open ascocarp.



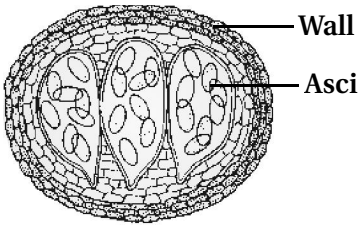
Apothecium

(ii) **Perithecium :** Flask-shaped ascocarp with an apical pore.



Perithecium

(iii) **Cleistothecium :** Closed ascocarp i.e. ascocarp with no opening.



Cleistothecium

6) What observable features in Trypanosoma would make you classify it under Kingdom-Protista ? #

➠ Observable features in Trypanosoma are :

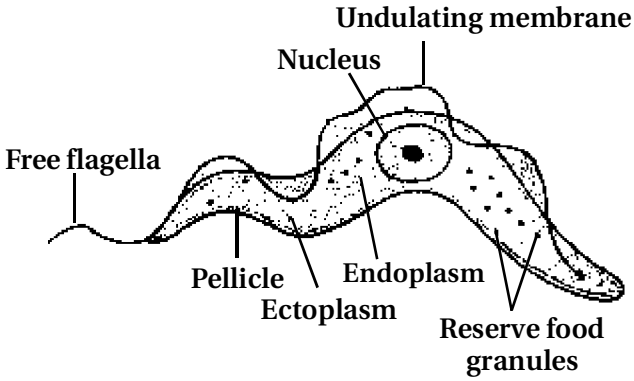
(i) Unicellular, flagellum with basal granules.

(ii) Well-developed nucleus like eukaryotes.

(iii) It has centrally located nucleus.

(iv) Method of reproduction is asexual.

(v) Reserve food material in the form of granules.



7) Fungi are cosmopolitan, write the role of fungi in your daily life.

➠ **Role of fungi in daily life are following :**

(i) Some fungi rotten food materials like stale bread, fruits and vegetables.

(ii) Fermentation is possible only because of yeast.

(iii) Dangerous diseases of plants and animals are caused by some fungi.

(iv) Some fungi are used for making antibiotics.

✤ Long Answer Type Questions : S8

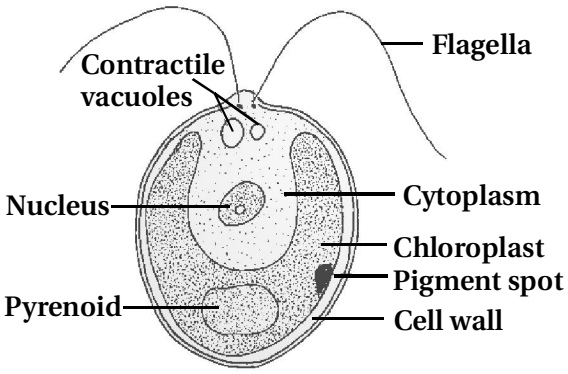
1) Algae are known to reproduce asexually by variety of spores under different environmental conditions. Name these spores and the conditions under which they are produced.

➠ Algae reproduce asexually by variety or spores under different environmental conditions.

➠ These spores and the conditions under which they are produced are as follow :

(a) **Zoospores :** These are thin walled, flagellated motile spores as they are equipped with flagella.

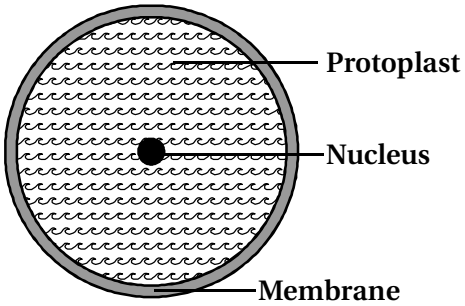
➠ **'Conditions under which it is produced :** These are formed under favourable conditions and spread by wind.



Zoospore of Chlamydomonas

(b) **Aplanospores :** These are thin walled non-motile spores and lack flagella.

➠ **Conditions under which it is produced :** These are formed under unfavourable conditions.



Aplanospore of Spirogyra

(c) **Hypnospore :** These spores have thick cell wall to tide over unfavourable conditions.

➠ **Conditions under which it is produced :** These are formed under unfavourable conditions.

(d) **Akinetes :** These are formed from vegetative cells and serve as resting cells.

➠ **Conditions under which it is produced :** Formed under unfavourable conditions.

(e) **Statospore :** These are similar to akinetes and are found in diatoms.

➠ **Conditions under which it is produced :** Formed under unfavourable conditions.

2) Apart from chlorophyll, algae have several other pigments in their chloroplast. What pigments are found in blue, green, red and brown algae, that are responsible for their characteristic colours ?

➠ Algae have many other pigments in their chloroplast; in addition to chlorophyll. The following table shows various pigments in algae and colour imparted by them :

Common Name	Class	Major Pigment	Colour	Example
Green algae	Chlorophyceae	Chlorophyll a, b	Green	Ulothrix
Brown algae	Phaeophyceae	Chlorophyll a, c Fucoxanthin	Brown	Laminaria
Red algae	Rhodophyceae	Chlorophyll a, d r - phycoerythrin	Red	Porphyra

3) Make a list of algae and fungi that have commercial value as source of food, chemicals, medicines and fodder. #

➠ Some algae of commercial importance are :

(1) **Agar :** It is derived from red algae Gelidium and Gracilaria.

➠ **Use :** It is used as culture medium in Laboratory.

(2) **Algin and carrageen :** Algin is derived from brown algae and carrageen is derived from red algae.

➠ **Use :** It is used as gelling agent in food and in medical dressing.

(3) **Food :** Many species of Porphyra, Laminaria, Sargassum.

➠ **Use :** These marine algae are used as food items especially in the East Asian nation.

(4) Some brown algae like Fucus, Sargassam, Laminaria, Macrocystis and Rhodymenia are important fodder for cattle.

(5) Alginic acid is a phycocolloid obtained from a number of brown algae such as Alaria, Macrocystis, Ascophyllum, Laminaria. It is used as emulsifier, thickener, gelating agent in toothpastes, shaving creams, icecreams, emulsion paints, shampoo etc.

(6) Fucus and Laminaria are rich in iodine.

(7) Some algae like Corallina, Polysiphonia have medicinal properties.

(8) Some protein rich algae like chlorella and spirulina are used as food supplements by sailors and space travellers.

(9) The algae Gelidium and Gracilaria are used to produce agar which is used in preparation of ice cream and jellies.

➠ Some fungi of commercial importance :

(1) **Medicine :** The fungus penicillium notatum is used for producing antibiotics of penicillin group.

(2) **Food processing :** Yeast has been in use since ages for fermentation. Alcoholic beverages and bakery items are made because of fermentation by yeast.

(3) **Food :** Some varieties of Agaricus are used as food in many countries.

4) 'Peat' is an important source of domestic fuel in several countries. How is 'Peat' formed in nature ?

➠ Peat is an accumulation of partially decayed vegetation or organic matter.

➠ **Formation of Peat :** When plant material, usually in wet areas, in inhabited from decaying fully because of acidic and anaerobic conditions, it result in formation of peat. Peat is mainly composed of wet land vegetation. Sphagnum is the main producer of peat, but many other plants may also be involved in peat formation. Peat accumulation is usually slow, at the rate of 1 millimeter per year.

5) Biological classification is a dynamic and ever evolving phenomenon which keeps changing with our understanding of life forms. Justify, the statement taking any two examples.

➠ Biological classification keeps changing with our understanding of life forms.

➠ Initially, new characters were taken by Aristotle, Theophrastus, John Ray and Linnaeus.

➠ Linnaeus divided plants on the basis of sex organs only.

- As more and more knowledge gathered for delimitation of taxa, the ways for natural system of classification became clear.
- This can be understood by following examples :
  - **(i)** Two kingdom classification was replaced by three kingdom classification when Haeckel (1866) proposed the kingdom of protista.
  - **(ii)** It was converted into four kingdom classification by copeland when he proposed the Kingdom - Monera.
  - **(iii)** Whittaker in 1969 proposed five kingdom classification.
  - **(iv)** As the information about biochemistry of archaebacteria gathered, woese raised another kingdom, Archaea.

Chapter Image

- Biological classification of plants and animals was first proposed by Aristotle on the basis of simple morphological characters. Linnaeus later classified all living organisms into two kingdoms – Plantae and Animalia.
- Whittaker proposed an elaborate five kindgom classification – Monera, Protista, Fungi, Plantae and Animalia.
- The main criteria of the five kingdom classification were cell structure, body organisation, mode of nutrition and reproduction, and phylogenetic relationships.
- In the five kingdom classification, bacteria are included in Kingdom Monera. Bacteria are cosmopolitan in distribution. These organisms show the most extensive metabolic diversity. Bacteria may be autotrophic or heterotrophic in their mode of nutrition.
- Kingdom Protista includes all single-celled eukaryotes such as Chrysophytes, Dinoflagellates, Euglenoids, Slime-moulds and Protozoans. Protists have defined nucleus and other membrane bound organelles. They reproduce both asexually and sexually.
- Members of Kingdom Fungi show a great diversity in structures and habitat. Most fungi are saprophytic in their mode of nutrition. They show asexual and sexual reproduction. Phycomycetes, Ascomycetes, Basidiomycetes and Deuteromycetes are the four classes under this kingdom.
- The plantae includes all eukaryotic chlorophyll-containing organisms. Algae, bryophytes, pteridophytes, gymnosperms and angiosperms are included in this group. The life cycle of plants exhibit alternation of generations – gametophytic and sporophytic generations.
- The heterotrophic eukaryotic, multicellular organisms lacking a cell wall are included in the Kingdom Animalia. The mode of nutrition of these organisms is holozoic. They reproduce mostly by the sexual mode.
- Some acellular organisms like viruses and viroids as well as the lichens are not included in the five kingdom system of classification.

Questions from Module

✤ Important MCQ for NEET : S10

1) State the component of fungal cellulose. #

(A) Chitin (B) Cellulose

(C) Chitin + Polysaccharides (D) Chitin + Cutin

Ans. (C) Chitin + Polysaccharides

2) Give example of Duteromycetes.

(A) Agaricus (B) Puccinia (C) Aspergillus (D) Trichoderma

Ans. (D) Trichoderma

✤ Question Paper : S11

1. Answer the following questions : (Each of 1 mark) [05]

1) State the types of bacteria, based on shape.

2) What is mycoplasma ?

3) Give example of flagellated protozoans.

4) Explain the structure of mycelium.

5) Explain – Viroids

2. Answer briefly : (Each of 2 marks) [04]

6) Explain – Chrysophytes.

7) Write short note - Archaebacteria.

3. Answer the following questions : (Each of 3 marks) [06]

8) Three domain classification.

9) Mention various orders of fungi - Explain Ascomycetes.

4. Describe in detail : [05]

10) Explain – about Virus in detail with neat labelled diagram.

❊ ❊ ❊

2 Biological Classification

☆ Analogy Type Questions ☆ S12

1) Ustilago : basidiomycetes : : colletotrichum : .... #
2) Morels : ascomycetes : : puccinia : .....
3) Algal component : Phycobiont : : fungal component : .....
4) Chrysophytes : diatomaceous earth : : dinoflagellates : .....

Ans. **(1) Deuteromycetes (2) Basidiomycetes (3) Mycobiont (4) Red tides**

☆ True or False ☆ S13

1) Most of the chrysophytes are photosynthetic.
2) Protists reproduce asexually and sexually by process involving cell fusion and zygote formation.
3) Gonyaulax is dinoflagellate.
4) Members of phycomycetes are found in dry habitat.
5) Mycelium of Rhizopus is septate.
6) Ascomycetes are saprophytic.
7) Asexual reproduction is by conidia or sporangiospores or zoospores in fungi.
8) Albugo is symbiont on mustard.
9) Trichoderma belongs to ascomycetes.
10) Viruses are non-cellular organisms.

Ans. **(1) True (2) True (3) True (4) False (5) False (6) True (7) False (8) False (9) False (10) True**

☆ Pick up the correct option ☆ S14

1) The mode of nutrition in Animalia is autotrophic / holozoic.
2) Deuteromycetes reproduces by asexual / sexual spores.
3) Viroids contain / lack protein coat.
4) Bacteriophages are virus that infect bacteria / bacteria that infect virus.
5) Viruses are facultative / obligate parasites.
6) Mumps / Malaria is caused by virus.
7) Morels and truffles are edible / toxic.
8) Fruiting bodies are distinct / inconspicuous structures which produces spores in fungi.
9) Paramoecium is ciliated / flagellated protozoan.
10) Euglenoids contain protein rich layer called pellicle / cell wall.

Ans. **(1) holozoic (2) asexual (3) lack protein (4) infect bacteria (5) obligate (6) Mumps (7) edible (8) distinct (9) ciliated (10) pellicle**

☆ Fill in the blanks ☆ S15

1) In diatoms the cell walls form two thin overlapping shell which fit together as in .....
2) Mycoplasma are organism which completely lack .....
3) Bacteria as a group show most ..... diversity.
4) The colonies of eubacteria are generally surrounded by .....
5) ..... are specialised cells in nostoc which can fix atmospheric nitrogen.
6) Cell wall in fungi is without .....
7) Spores of slime moulds are ..... resistant and survive for ..... years.
8) Diatoms are the ..... in the oceans.
9) Yeast belongs .....
10) The sex organs are ..... but plasmogamy is brought about by fusion of two vegetative cells.

Ans. **(1) a soap box (2) cell wall (3) extensive metabolic (4) gelatinous sheath (5) Heterocyst (6) cellulose (7) extremely, many (8) chief producers (9) ascomycetes (10) absent**

UID : P1-C2-S12-Q1

☆ Multiple Choice Questions (MCQs) ☆ S16

✤ Darpan Based MCQs

1) **Who was the earliest to attempt a more scientific basis for classification ? #**
(A) Linnaeus (B) Aristotle
(C) Bentham and Hooker
(D) None of these

2) **Two kingdom classification was given by**
(A) Linnaeus (B) Aristotle
(C) Bentham and Hooker
(D) None of these

3) **Who proposed five kingdom classification ?**
(A) R. H. Whittaker (B) Ramesh Mishra
(C) Aristotle (D) Linnaeus

4) **Which criteria was used by R. H. Whittaker for classification ?**
(A) Cell structure (B) Thallus organization
(C) Mode of nutrition (D) All of these

5) **Body organisation in fungi :**
(A) Cellular (B) Acellular
(C) Multicellular (D) Organ level

6) **Which are the sole members of kingdom Monera ?**
(A) algae (B) bacteria (C) fungus (D) diatoms

7) **What is the shape of vibrium ?**
(A) rod shaped (B) spiral shaped
(C) comma-shape (D) spherical

8) **Archaebacteria differ from other bacteria :**
(A) different cell wall structure
(B) in terms of their genetic material
(C) contains 80S Ribosomes
(D) All of these

9) **Methanogens can be used for production of**
(A) LPG (B) CNG
(C) Biogas (D) All of these

10) **Which bacteria are the most abundant in nature ?**
(A) Heterotrophic (B) Halophiles
(C) Methanogens (D) None of these

11) **All single-celled eukaryotes are placed under**
(A) Fungi (B) Protista
(C) Plantae (D) Animalia

12) **The spores of slime moulds possess**
(A) false walls (B) true walls
(C) 80S ribosomes (D) none of these

13) **The sea appears red due to rapid multiplication of**
(A) Euglenoids (B) Chrysophytes
(C) Dinoflagellates (D) Slime moulds

14) **What is true for all protozoans ?**
(A) are heterotrophs
(B) they are either predators or parasites
(C) they are believed to be primitive relatives of animals
(D) all of these

15) **Which of the following are known as chief producers in the ocean ?**
(A) Euglena (B) Diatoms
(C) Gonyaulax (D) Mycoplasma

16) **Sleeping sickness is caused by**
(A) Wuchereria (B) Amoeba
(C) Trypanosoma (D) Filaria worm

17) **Which is the parasitic fungi on mustard ?**
(A) Rhizopus (B) Mucor
(C) Albugo (D) Penicillium

18) **Amoeboid protozoans are found in**
(A) fresh water (B) sea water
(C) moist soil (D) all of these

19) **Fungus used extensively in biochemical and genetic work**
(A) Neurospora (B) Aspergillus
(C) Claviceps (D) Ustilago

20) **Which fungi is commonly known as imperfect fungi ?**
(A) Basidiomycetes (B) Deuteromycetes
(C) Ascomycetes (D) Phycomycetes

Ans. : (1 – B) (2 – A) (3 – A) (4 – D) (5 – C) (6 – B) (7 – C) (8 – A) (9 – C) (10 – A)
(11 – B) (12 – B) (13 – C) (14 – D) (15 – B) (16 – C) (17 – C) (18 – D) (19 – A) (20 – B)

UID : P1-C2-S16-Q1

21) **Viroids are #**
(A) parasitic DNA (B) free RNA
(C) free DNA (D) none of these

22) **Which of the following is indicator of pollution ?**
(A) Viroids (B) Virus
(C) Lichens (D) Algae

23) **Colletotrichum belongs to**
(A) Deuteromycetes (B) Ascomycetes
(C) Basidiomycetes (D) Phycomycetes

24) **Rusts and smuts belongs to**
(A) Deuteromycetes (B) Basidiomycetes
(C) Ascomycetes (D) Phycomycetes

25) **Aristotle's classification of plants is based on the .....**
(A) Size of plant
(B) Flowering or non-flowering
(C) Number of cotyledons present
(D) Type of roots they have

26) **Whittaker's 5 kingdom classification, all the prokaryotic organisms are grouped under .....**
(A) Monera (B) Protista
(C) Fungi (D) Animalia

27) **Cell wall in fungi is made up of .....**
(A) Chitin (B) Cellulose
(C) Amino acids (D) Proteins

28) **Methanogens are present in the .....**
(A) Mouth of cow (B) Guts of cow
(C) Respiratory system of cow
(D) Ribs of a cow

✤ Assertion & Reason Type Questions

(a) A and R both are correct and R is correct explanation of A.

(b) A and R are correct but R is not correct explanation of A.

(c) A is correct and R is false.

(d) Both A and R are false.

29) **A : Rhizopus does not form zygospores.**
R : It shows heterothallism.
(A) a (B) b (C) c (D) d

30) **A : A virus attacking a bacterium is called bacteriophage.**
R : A virus attacking blue green algae is called cyanophage.
(A) a (B) b (C) c (D) d

31) **A : Bacteria are prokaryotic.**
R : Bacteria do not posses true nucleus and membrane bound cell organelles.
(A) a (B) b (C) c (D) d

32) **A : Phycomycetes are generally called algal fungi.**
R : It is believed that phycomycetes have evolved from algae.
(A) a (B) b (C) c (D) d

33) **A : Mushrooms are not regarded plants.**
R : Unlike plants mushrooms are heterotrophic.
(A) a (B) b (C) c (D) d

✤ MCQs Asked In NEET Exam

34) **Which of the following statements is incorrect ?** **[NEET - 2019]**
(A) Prions consist of abnormally folded proteins.
(B) Viroids lack a protein coat.
(C) Viruses are obligate parasites.
(D) Infective constituent in viruses is the protein coat.

35) **Which of the following statements is incorrect ?** **[NEET - 2019]**
(A) Yeasts have filamentous bodies with long thread-like hyphae.
(B) Morels and truffles are edible delicacies.
(C) Claviceps is a source of many alkaloids and LSD.
(D) Conidia are produced exogenously and ascospores endogenously.

Ans. : **(21 – B) (22 – C) (23 – A) (24 – B) (25 – A) (26 – A) (27 – A) (28 – B) (29 – D) (30 – B) (31 – A) (32 – A) (33 – A) (34 – D) (35 – A)**

UID : P1-C2-S16-Q21

36) Which one of the following statements regarding post-fertilization development in flowering plants is incorrect ? #[NEET - 2019]

(A) Ovules develop into embryo sac

(B) Ovary develops into fruit

(C) Zygote develops into embryo

(D) Central cell develops into endosperm

37) Which of the following is correct about viroids ? [NEET - 2020]

(A) They have free RNA without protein coat

(B) They have DNA with protein coat

(C) They have free DNA without protein coat

(D) They have RNA with protein coat

38) Which of the following statements is correct ? [NEET - 2021]

(A) Organisms that depend on living plants are called saprophytes

(B) Some of the organisms can fix atmospheric nitrogen in specialized cells called sheath cells

(C) Fusion of two cells is called Karyogamy

(D) Fusion of protoplasms between two motile on non-motile gametes is called plasmogamy

Ans. : (36 – A) (37 – A) (38 – D)

❊ ❊ ❊