5. How can you as an individual prevent the loss of biodiversity?

Ans. As an individual, one can prevent the loss of biodiversity in the following manner –

1. Reduction of the use of fertilizers or pesticides in the crop field.
2. Restoration of the habitat in your yard.
3. Restoration of the habitat in your commu...
4. Hunting should be banned or regulated.
5. Over exploitation of natural resources must b...
6. Maintain the policy of 3 R's – Reduce, R... Recycle.
7. Consume organic foods.
8. Donate to conservation efforts.

INTEXT QUESTIONS Pg. No 1 - 4

What is the difference between living and non-living things? *(Can you recall? TB Pg. No. 1)*

Ans.
1. Living beings are lively and active.
2. Living beings are made up of cells and they exhibit life characteristics such as movement, growth, reproduction and require energy for performing daily activities.
3. But, non-living things do not grow, reproduce, respire and does not require energy.

Enlist the characters of living organisms. *(Can you recall? TB Pg. No. 1)*

Ans. There are seven characteristics of living organisms such as –

1. They show growth and development.
2. They need food, air and water for their survival.
3. They respire, i.e. release energy from food substances in living cells.
4. They can show movement by themselves.
5. They have a definite life span.
6. They can reproduce and multiply.
7. They have the ability to sense and respond to external stimuli.

Whether all organism are similar? Justify your answer. *(Can you recall? TB Pg. No. 1)*

Ans.
1. All organisms have been evolved from few common ancestors.
2. This means that all organisms are related but has changed to adapt to their environment.
3. Biodiversity is essential to maintain the ecological stability.
4. The extent of complexity and density of biodiversity can be regarded as a measure of health of an ecosystem.

How can we study large number of organisms at a glance? *(Can you tell? TB Pg. No. 1)*

Ans.
1. Classification helps to study a large number of ...anisms at a glance.
2. ...matic classification helps in the arranging the ... in sets or groups on the basis of their simi... and/or differences.

Whether all organisms prepare their own food? *(Can you tell? TB Pg. No. 1)*

Ans.
1. No, all organisms cannot prepare their own ...
2. Autotrophs are the organisms who prepare the... food using light, carbon dioxide, water and ... chemicals.
3. But, heterotrophs cannot do the same; they ... on autotrophs for their survival.

Which feature can be considered as all in... characteristic of life? Why? *(Can you tell? TB Pg...*

Ans. All the living organisms respond to thermal, chem... biological changes in the surrounding. Thus, re... to stimuli is considered as the unique property of ... beings.

Can metabolic reactions demonstrated in a test ... (called 'in vitro' tests) be called living? *(Think about it. TB Pg. No. 1)*

Ans.
1. Any kind of metabolic reactions demons... outside the body of the organism which is perf... in a test tube is not considered as living or ... living.
2. These can be considered as living reactions w... occur outside the cellular organization of the b...
3. Cellular organization is considered as defi... feature of life forms.

Nowadays patients are declared 'brain dead' and ... on life support. They do not show any sign of ... consciousness. Are they living or non-living? *(Think about it. TB Pg. No. 1)*

Ans. Yes, they are considered as living.

1. Those patients who are declared as 'brain dead' ... who are on life support are still living and ... nourishment and maintenance.
2. They are not conscious of its surro... environment. Thus, they will be not be capa... responding to the external environmental stim...
3. The person is supported by machines for ... functions of the body. The person is ot... brain dead.

TEXTBOOK EXERCISE

Pg. No 5

1. Choose correct option

A. Which is not a property of living being?
(a) Metabolism (b) **Decay**
(c) Growth (d) Reproduction

B. A particular plant is strictly seasonal plant. Which one of the following is best suited if it is to be studied in the laboratory?
(a) **Herbarium** (b) Museum
(c) Botanical Garden (d) Flower exhibition

C. A group of students found two cockroaches in classroom. They had a debate whether they are alive or dead. Which life property will help them to do so?
(a) Metabolism
(b) Growth
(c) Irritability
(d) Reproduction

2. Distinguish between botanical gardens, zoological parks and biodiversity parks with reference to characteristics.

Ans.

Botanical gardens	Zoological parks	Biodiversity parks
Botanical gardens are the places where plants of different parts of the world are grown in a scientific and systematic in an *in-vivo* manner.	Zoological parks generally known as zoo, is a place where wild animals are kept in captivity.	Biodiversity parks are ecological assemblage of species that form self-sustaining communities on degraded barren landscape.
They are important for their records of local flora and their label board shows scientific as well as common name of the plant with its family.	They are protected and care is taken to provide conditions similar to their natural habitat and here naturalist can study food habits and behaviour of animals.	Here all biodiversity are conserved.
One of the oldest botanical garden in West Bengal is Acharya Jagdish Chandra Bose Indian Botanical Garden is the best place to study a wide range of flora of world.	Arignar Anna Zoological Park in India located in Chennai which holds about 1500 species of fauna and its rich wildlife attract many naturalist.	Late Uttamrao Patil Biodiversity Park Gureghar, Mahabaleshwar is the best model for conservation of natural heritage in urban landscape.

3. Answer the following questions

A. Jijamata Udyan, the famous Zoo in Mumbai has acclimatised the Humboldt penguins. Why should penguins be acclimatised when kept at a place away from natural habitat?

Ans.

1. The Humboldt penguin is a South American species found in cold climate of coastal Peru and Chile.

JijamataUdyan

2. These penguins is the new attraction in Jijamata Udyan (Byculla / Mumbai Zoo).
3. The penguins survive in the extremely cold ecosyste by developing physiological mechanisms.
4. Thus, it is necessary to acclimatize them maintaining their metabolic activities.

B. Riya found peculiar plant on her visit to Himach Pradesh. What are the ways she can show it to h biology teacher and get information about it?

Ans.

Herbaria

4. Some of these patients never come back to normal life. They can neither be called living nor non-living or dead.

What are the essentials of a good herbarium?
(Can you tell? TB Pg. No. 3)

Ans.
1. Herbaria are effective tools in taxonomic studies.
2. A herbarium is essentially dried plant specimen that is pressed, treated and mounted on standard size sheets in order to preserve it.
3. The main function of the herbarium is in the study of plant taxonomy and geographic distribution.
4. Herbarium specimens are used to catalogue or identify the flora of a particular area.
5. Also, herbarium specimens serve as a historical record of change in vegetation over the period of time.

Why should we visit botanical gardens, museums and zoo? *(Can you tell? TB Pg. No. 3)*

1. Botanical garden maintains the living collection of plants for purpose of research and education.
2. Most of the biological museums in educational institutions serve as a reference hub of biodiversity studies. One can also find systematic collections of shells, skeletons of animals, insect boxes.
3. In case of zoo, it provides a platform to study food habits and behaviour of animals.

Did Bauxite mining in Western Ghats affect critically endangered species like – Black Panther, different *Ceropegia spp., Eriocanlon spp.*?
(Find Out. TB Pg. No. 4)

1. Western Ghats is the one of the most biodiverse regions of the country.
2. Western Ghats serves as home to various wildlife such as Black Panther, leopard, bison, deer, etc.
3. The bauxite mining has causes several environmental impact on the natural habitat of the organisms living in that area.
4. The bauxite dust released during the mining creates several negative impacts on the habitat of these organisms.
5. Thus, on the basis of several impact studies, it can be concluded that, bauxite mining has negatively affected the populations of Black Panther, different *Ceropegia spp., Eriocanlon spp.*, etc.

What is 'ex-situ' and 'in-situ' conservation?
(Can you tell? TB Pg. No. 3)

Ans. *Refer US Pg. No. 3 Q. 3 (E)*

Laws to protect and conserve biodiversity in India.
(Find Out. TB Pg. No. 4)

Ans.
1. Environment Protection Act, 1986
2. Biological Diversity Act, 2002
3. Forest Conservation Act, 1980
4. Wildlife protection Act, 1972
5. Indian Forests Act, 1927

Environmental effects of ambitious projects like connecting rivers or connecting cities by construct roads. *(Find Out. TB Pg. No. 4)*

Ans. Some environmental effects are :
1. It leads to deforestation.
2. Various natural resources are used and destro while carrying out such projects.
3. Natural ecosystem of many plants and animals destroyed.
4. It leads to pollution of air, water and land.

Some major Botanical Gardens of the world are:

- Main Botanical garden Moscow. Largest garden, spread over an area of 900 acres.
- Bundes garden, Vienna. It is spread over an area of 400 acres.
- Royal Botanical Garden, Kew London; it has an area of 300 acres but grows a very large number of plants.
- Kebun Raya (Botanical Garden) Bojor Java. Spread over an area of 200 acres, the garden has section with virgin rain forest.
- Indian Botanical Garden Sibpur, Kolkata. It is the largest botanical garden of Asia spread over 273 acres which is famous its Great Banyan tree, Palm house, Succulent Plants, Indian Grasses etc.

1. Riya can prepare a herbarium sheet of the plant collected from Himachal Pradesh and show it to biology teacher.
2. A herbarium is essentially a dried plant specimen that is pressed, treated and mounted on standard size sheet in order to preserve it.
3. The date, place of collection along with the detailed classification and highlighting with its ecological peculiarities, character of the plant can be recorded on the same sheet.

C. At Andaman, authorities do not allow tourists to collect shells from beaches, why it must be so?

Ans. 1. Under Wildlife Conservation Act 2013, one is not supposed to take away any wildlife articles from their place of origin.
2. Andaman and Nicobar Islands are considered as the biodiversity rich areas.
3. Hence, the authorities do not allow tourists to collect the sea shells from beaches and take it to the mainland, without any permission from the authorities.

D. Why do we have greenhouse in botanical gardens?

Ans. 1. A greenhouse is a structure with walls and roof made chiefly of transparent material, such as glass, in which the plants requiring regulated climatic conditions are grown.

Greenhouse

2. In the botanical gardens, the greenhouse maintain the perfect growing environment for the plants.
3. On the basis of the technical specifications, each greenhouse controls the temperature, light, irrigation, fertilizers, humidity, etc.

What do you understand from terms like *in-situ* and *ex-situ* conservation?

1. '*In-situ*' conservation is the on-site conservation of the genetic resources in natural populations, such as conservation of forests. In other words, endangered plants and animals are protected from predators in the natural habitat itself.
2. '*Ex-situ*' is considered as the conservation of the components of the biological diversity outside their natural habitats. It includes cultivated and wild species, as well as genetic resources.

4. Write short notes

A. Role of human being in biodiversity conservation.

Ans. We can participate in biodiversity conservation by increasing our awareness on the impacts of biodiversity loss. Also, we should support actions and policies implemented by the government in conserving biodiversity.

Following actions should be implemented for the proper biodiversity conservation-

1. Maintain wetlands by conserving water and reducing irrigation.
2. Leave native plants undisturbed.
3. Control new weeds in the property.
4. Species that belongs to critical wildlife habitat should be identified and maintained.
5. Livestock grazing should be managed.
6. Always use organic products and the methods for pest control.
7. Always follow the three 'R' policy i.e., Recycle, Reuse and Reduce.

- One of the leading botanists of India, *Dr. S. P. Agharkar* was born in November 1884 in Malvan, Maharashtra.
- He explored biodiversity of Western Ghats where he came across a species of freshwater jellyfish, which was until then only known to be found in Africa.
- These findings were published in scientific journal Nature in 1912.
- Dr. Annandale, the Superintendent of the Indian Museum in Kolkata, helped Dr. Agharkar in his further endeavours to collect, preserve and conduct microscopic examinations of animal and plant specimens. The institute ARI, Pune has been named after his name.

Dr. S. P. Agharkar

B. Importance of botanical gardens.

Ans. The importance of botanical gardens are –

1. They have contributed to the science of botany fr ancient times.
2. It maintains the records of local flora.
3. It helps in maintaining the monographic work.
4. They provide facilities for the collection of liv plant material for studies.
5. They supply seeds and material for botan investigations.
6. They also contain information in the form of herb green houses, research laboratory and library.

Answer the following questions

We observe that land becomes barren soon after monsoon. But in the next monsoon it flourishes again with varieties we observed in season earlier. How you think it takes place?

1. During monsoon, soil erosion may take place due to heavy rainfall, surface water runoff carries soil away and deposits it elsewhere.
2. Along with too layer of soil the plant nutrients are lost and land become barren.
3. Plant growth becomes sparse and stunted underground modifications of stems and roots of plants such as rhizome, tuber, bulb, corn, runner, stolon, etc. remain deep in the soil inactive and undergo vegetative propagation during suitable climate.
4. Thus, in the next monsoon the plants flourish again with varieties we observed in season earlier.

Fern is a vascular plant. Yet it is not considered a Phanerogams. Why?

1. Phanerogams are commonly seed producing plants.
2. They produce special reproductive structures that are visible.
3. Though fern is a vascular plant, it is a spore producing plant and do not produce seeds and flowers.
4. Fern reproduces sexually by gametes but sex organs are concealed.

Therefore, fern is considered as Phanerogams.

C. *Chlamydomonas* is microscopic whereas *Sargassum* is macroscopic; both are algae. Which characters of these plants includes them in one group?

Ans.
1. Both *Chlamydomonas* and *Sargassum* are autotrophs.
2. They have chorophyll pigments.
3. They are aquatic.
4. Vascular system, i.e. conducting tissues are absent.
5. Their reserve food is generally starch.
6. Cell wall contains cellulose.
7. Plant body is not differentiated into roots, stem and leaves.
8. Due to these characteristics, both chlamydomonas and sargassum are included in the same group.

6. Girth of a Maize plant does not increase over a period of time. Justify.

Ans.
1. Maize is an angiosperm. It comes under the class monocotyledonae.
2. In monocots, secondary growth is absent due to absence of cambium.
3. Cambium is essential for secondary growth and secondary growth is responsible for increase in girth.

7. Radha observed a plant in rainy season on the compound wall of her school. The plant did not have true roots but rootlike structures were present. Vascular tissue was absent. To which group the plant may belong?

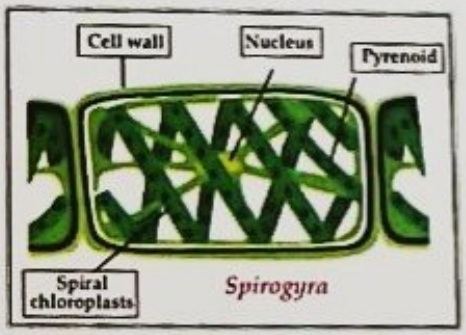
Ans. The plant belongs to the division Bryophyta and group mosses (musci).

Draw neat labelled diagrams.

A. *Spirogyra* **B. *Chlamydomonas*** **C. *Funaria*** **D. *Nephrolepis***

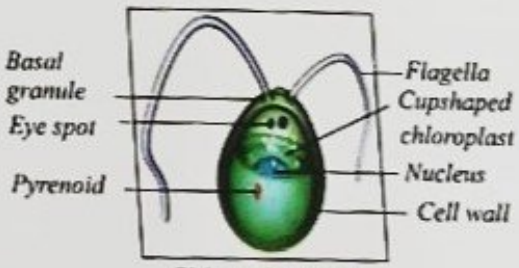
E. Haplontic and haplodiplontic life cycle

A.



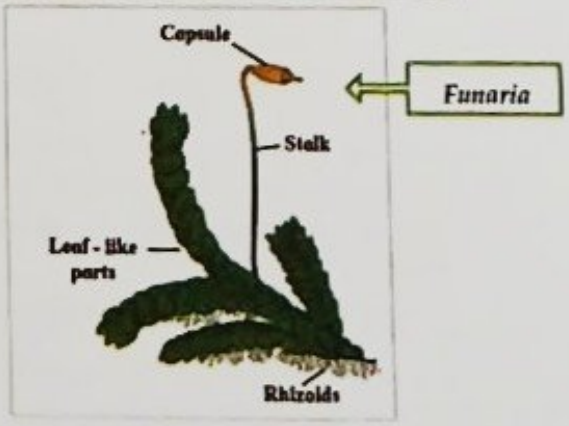
Spirogyra

B.

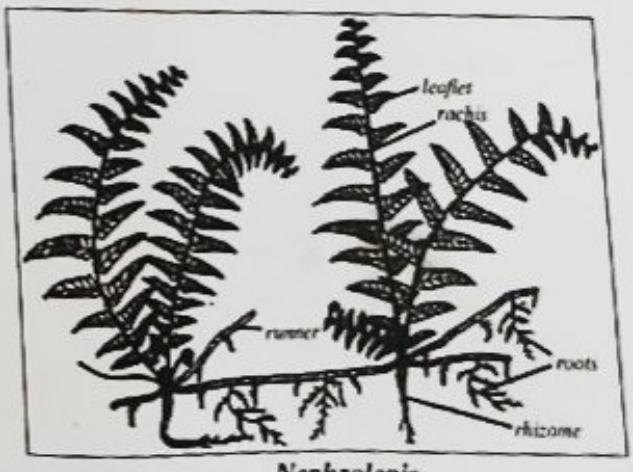


Chlamydomonas

C.

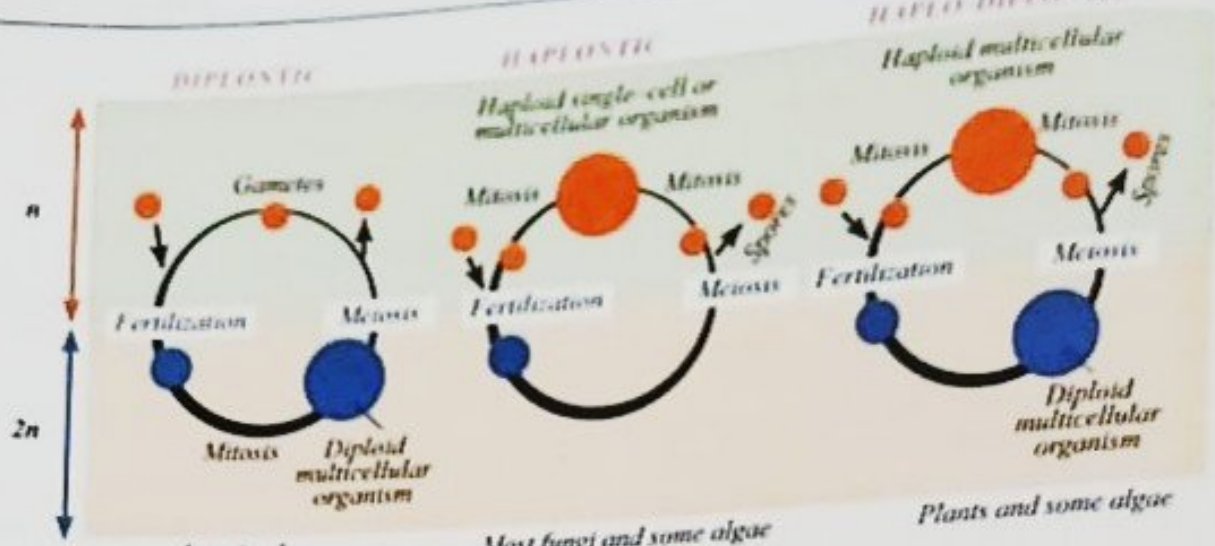


D.



Nephrolepis

E.



Types of life cycle

Remember

Haploid gametophytic and spore producing sporophytic generation alternate with each other in this process.

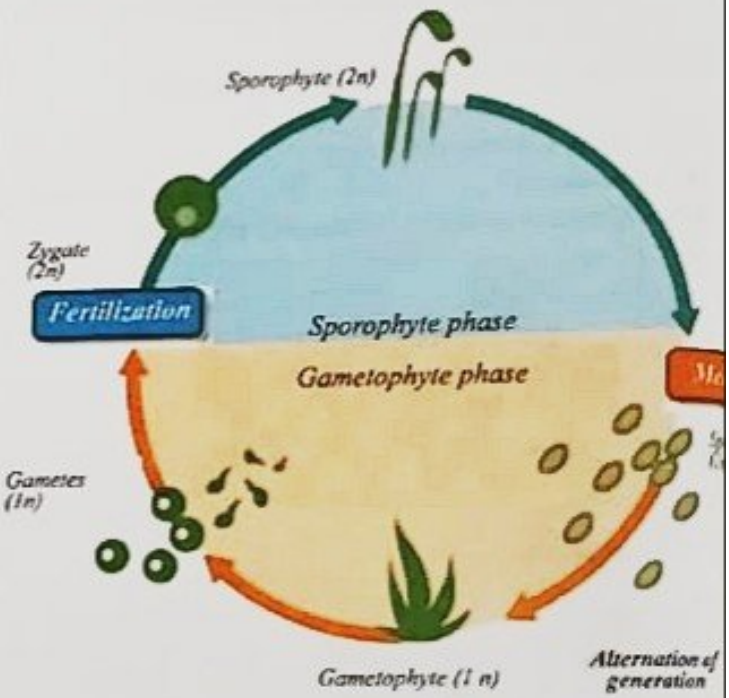
- **Haplontic :** Gametophytic phase dominant. e.g., *Chlamydomonas*
- **Diplontic :** Sporophytic phase dominant. e.g., Angiosperms and Gymnosperms
- **Haplo-Diplontic :** Intermediate like stage where gametophytic and sporophyticstage partially dominates at different st e.g., Bryophytes and Pteridophytes.
- **Exceptions :** *Ectocarpus, Polysipnoniaare* Haplo-diplontic algae. *Fucus* is diplontic alga.

9. Identify the plant groups on the basis of following features.

A. Seed producing plants
B. Spore producing plants
C. Plant body undifferentiated into root, stem and leaves
D. Plant need water for fertilization
E. First vascular plants

Ans. (a) Phanerogams (b) Cryptogams
(c) Thallophyta (d) Bryophta
(e) Pteridophya

10. Observe the following diagram. Correct it and write the information in your words.
(For diagram Ref. Textbook Pg. No. 28 Q. No. 10)
(OR) What is alternation of generations.
(Can you tell? TB Pg. No. 26)



Ans.
1. Life cycle of a plant includes two phases or distinct generations namely sporophyte (diploid : 2n) and gametophyte (haploid : n).
2. Some special diploid cells of sporophyte divide by meiosis to produce haploid cells.
3. These haploid cells divide mitotically to give rise to gametophyte.
4. The gametophyte produces male and female gametes which fuse during fertilization to produce diploid zygote.
5. It divides by mitosis to form diploid sporophy
6. The sporophytic and gametophytic gener generally occur alternately in the life cycle plant.
7. This phenomenon is called alternation of gener

TEXTBOOK EXERCISE

Pg. No 27 - 28

1. **Choose correct option**

A. Which is the dominant phase in Pteridophytes?
(a) Capsule (b) Gametophyte
(c) Sporophyte (d) Embryo

B. The tallest living gymnosperm among the following is
(a) *Sequoia sempervirens*
(b) *Taxodium mucronatum*
(c) *Zamia pygmaea*
(d) *Ginkgo biloba*

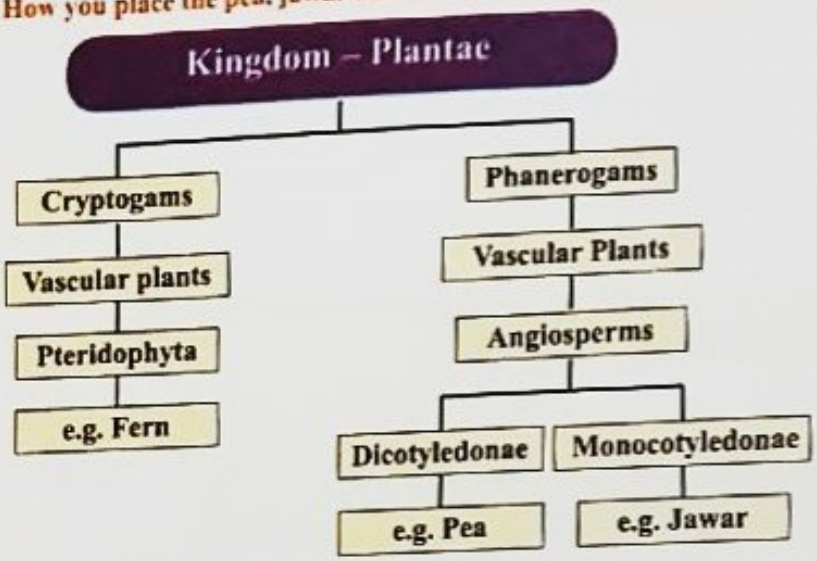
C. In Bryophytes,
(a) Sporophyte and gametophyte generation are independent
(b) Sporophyte is partially dependent upon gametophyte
(c) Gametophyte is dependent upon Sporophyte
(d) *Ginkgo biloba*

D. A characteristic of Angiosperm is
(a) Collateral vascular bundles
(b) Radial vascular bundles
(c) Seed formation
(d) Double fertilization

E. Angiosperms and Gymnosperms resemble in ha
(a) Vessels in wood
(b) Mode of nutrition
(c) Siphonogamy
(d) Nature of seed

2. **How you place the pea, jawar and fern at its proper systematic position? Draw a flow chart with example of.**

Ans.



3. **Complete the following table.**

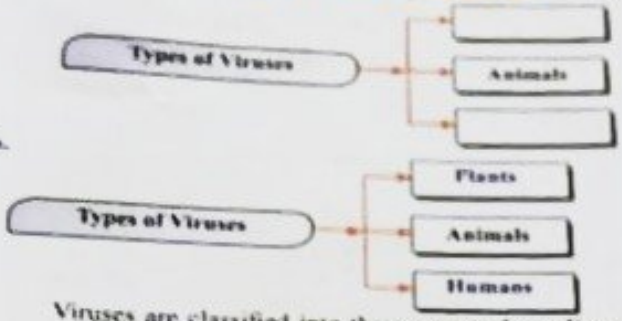
No.	Groups of algae	Chlorophyceae	Phaeophyceae	Rhodophyceae
1.	Stored food	Starch	**Mannitol, Laminarin and Starch**	**Floridean starch**
2.	Cell Wall	**Cellulose**	Cellulose and algin	**Cellulose, pectin glued with c carbohydrates**
3.	Major pigments	**Chl–a, b**	**Chl–a, c and fucoxanthin**	Chl–a, d and phycoerythri

4. **Differentiate between Dicotyledonae and Monocotyledonae based on the following characters**
(a) Type of roots (b) Venation in the leaves (c) Symmetry of flower

Ans.

No.	Characters	Dicotyledonae	Monocotyledonae
1.	Types of roots	Tap root system is seen.	Adventitious or fibrous root system is se
2.	Venation in the leaves	Leaves have reticulate venation.	Leaves have parallel venation.
3.	Symmetry of flower	Flowers show tetra or pentamerous symmetry.	Flowers show trimerous symmetry.

6. Complete chart and explain in your word.



Viruses are classified into three groups depending upon their hosts.

(a) ***Plant virus :*** The viruses which attack and infect plants are called plant viruses. These viruses consist of ssRNA or dsRNA. They show helical symmetry and are mostly rod shaped or cylindrical.

(b) ***Animal virus :*** The viruses that attack and infect animals are called animal viruses. The genetic material is RNA or DNA. They show radial symmetry. They are mostly polyhedral in shape.

(c) ***Bacterial Virus or Bacteriophage :*** The viruses which attack and infect bacteria are called bacteriophages or bacterial viruses. The genetic material is DNA. They are mostly tadpole shaped.

lant virus - TMV

Animal virus

Bacterial virus

Walter Reed was the one who discovered the first human virus, yellow fever virus, in 1901.It derived from a Latin word meaning slimy liquid or poison.

Identify the following diagrams, label them and write detail information in your words.

(a)

(b)

(c)

(d)

(e)

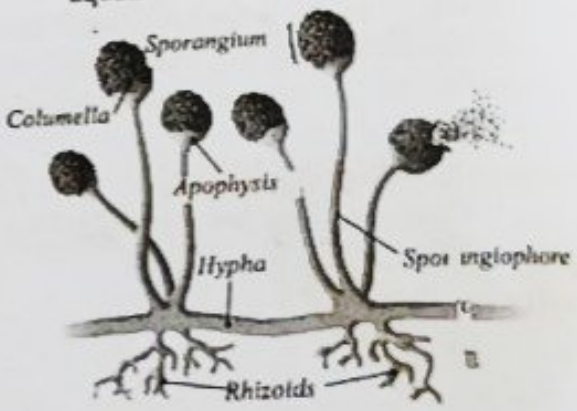
(f)

Ans. (a) ***Euglena :*** [*Ref. diagram Pg. No. 13 Q. No.*

1. It lacks a cell wall but possess a tough co of protinaceous cell wall. They posses flagella one short and one long.
2. They behave as heterotrophs in the abse light but possess pigments, similar to h higher plants for photosynthesis.

(b) ***Mucor :***

1. It is an algal fungi and their mycelium is mad of aseptatecoenocytic hyphae.
2. They commonly grow in moist and d habitats, on decaying organic matter as well aquatic habitats or as parasites on plants.



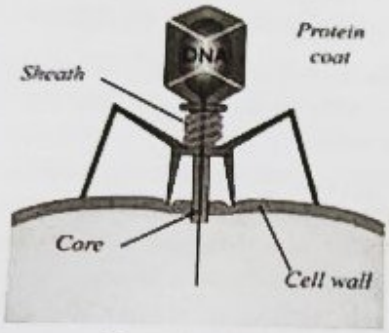
Mucor

(c) ***Paramecium :*** [*Ref. diagram Pg. No. 13 Q. N*

1. It is a ciliate protozoan havin cilia for loco
2. In *Paramecium*, gullet (a avity) open cell surface.

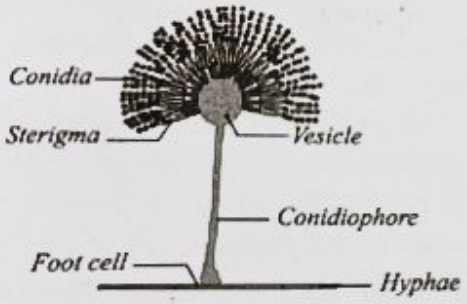
(d) **Bacteriophage :**

1. It infects and replicates within the bacteria.
2. All the bacteriophage is composed of nucleic acid molecules which are mostly surrounded by the protein coat.
3. These are inactive outside a host cell, but once they enter their specific host cell, they take charge of cellular machinery of host cell and duplicate themselves.



Bacteriophage

***Aspergillus* :**



Aspergillus

It is sac fungi and is mostly multicellular.
The hyphae are branched and septate.
Sac fungi can be decomposers, parasites or coprophilous grow on dung.
Breathing in of *Aspergillus* spores may cause certain illness.

(f) **Mushroom –**

Mushroom

1. It belongs to the class basidiomycetes and ar known as club fungi.
2. They have branched and septate hyphae.
3. These reproduce by the formation of basidiospor

8. The scientific name of sunflower is given belo Identify the correctly written name.

(a) *Helianthus annuus L.*

(b) *Helianthus Annuus l.*

Ans. ***Helianthus annuus L.*** (a) is the correct answer. In above answer, ***Helianthus*** indicates name of the g and second word ***annuus*** denotes name of the speci

9. Match the following.

Kingdom	Examples
(i) Monera	(a) *Riccia*
(ii) Protista	(b) *Cyanobacteria*
(iii) Plantae	(c) *Rhizopus*
(iv) Fungi	(d) Diatoms

Ans. (i) - (b), (ii) - (d), (iii) - (a), (iv) - (c)

10. Complete the following

(i) Plant like Protista – Diatoms

(ii) Animal like Protista **– *Entamoeba***

Ans. (i) Plant like Protista – Diatoms

(ii) Animal like Protista – *Entamoeba*

INTEXT QUESTIONS

Pg. No 6 - 16

ve kingdom system of classification?

recall? TB Pg. No. 6)

taker proposed the five kingdom classification , Monera, Fungi, Plantae and Animalia. fication was based on mode of nutrition, ic relationships, body organization and cell

Which characters of organisms are visibl

(Can you tell? TB Pg. No. 7)

Ans.

1. The characters such as growth, re responsiveness to stimuli are the vi of an organism.
2. Increase in cell number and size growth.
3. Similar to growth, organisms poss produce offspring.

Describe genetic material in plant and animal viruses as well as in bacteriophages.
(Can you tell? TB Pg. No. 15)

1. Genetic material in viruses is either single stranded RNA or single or double stranded RNA or double stranded
2. The genetic material of plant virus consists of single stranded RNA or double stranded RNA.
3. The genetic material of animal virus consists of RNA or DNA.

Differentiate between viruses and viroids. *(Can you tell? TB Pg. No. 15)*

Viruses :

1. Viruses are considered as pathogens with narrow host range and have a vague phylogenetic origin.
2. Viruses lack their own cell machinery and have a protein coat around nucleic acid strand, thus considered to be organisms.
3. Genetic material in viruses is either single stranded RNA or single or double stranded RNA or double stranded
4. Viruses that infect bacterial cells are known as bacteriophages which normally have double stranded DNA.

Viroids :

1. Infectious RNA strand are known as viroids.
2. Potato spindle tuber disease was found to be caused by single stranded RNA which lacks protein coat.
3. T.O. Diener in 1971 reported that this is low molecular weight RNA and smaller in size than viruses.

Complete the following table on the basis of previous knowledge. *(Observe & Discuss. TB Pg. No. 16)*

Characters	Monera	Protista	Fungi	Plantae	Animal
Cell type	Prokaryotes	Eukaryotic	Eukaryotic	Eukaryotic	Eukary
Cell wall	**Present**	Present in some organisms	**Present**	Present (Cellulose)	Absen
Nuclear membrane	Absent	Present	Present	**Present**	Presen
Body organization	Unicellular	**Unicellular or Multicellular**	Multicellular / Loose tissue	Tissue / Organ	Tissue / O system
Mode of nutrition	**Autotrophs or Heterotrophs**	Autotrophic, Photosynthetic, Heterotrophic	**Heterotrophs**	Autotrophic (Photosynthetic)	Heterotr
Ecological role	Decomposers	**Decomposers**	Decomposers	**Producers**	Consu

mplete the following table through collecting information about sunflower, tiger with characteristics featu
Yourself. TB Pg. No. 16)

Category	Taxon	Characteristics
Kingdom	Planate	Plant
Division	Angiospermae	Flowering plant
Class	Dicotyledonae	Dicotyledons
Sub - class	Asteridae	Mostly sympetalous with 2 fused carpels
Order	Asterales	Composite flowers made of florets
Family	Asteraceae	Aster family, largest plant families
Genus	*Helianthus*	Plant comprising about 70 species.
Species	*H.annuus*	The round flower heads in combination with the ligules look li

4. Along with these two, organisms are capable of responding to stimuli such as light, water, temperature, chemical substances, etc.

Remember

- Two kingdom classification: Given by Carolous Linnaeus – Plant kingdom and Animal kingdom.
- Five kingdom classification: By R. H. Whittaker. Monera, Protista, Fungi, Plantae and Animalia are the five kingdoms.

Name the recent approaches in taxonomy. *(Can you tell? TB Pg. No. 7)*

Ans. Molecular taxonomy, chemotaxonomy and numerical taxonomy are recent approaches in taxonomy.

What is DNA barcoding? *(Can you tell? TB Pg. No. 7)*

1. DNA barcoding is a new method for identification of any species based on its DNA sequence from a tiny tissue sample of the organism under study.
2. It helps to study newly identified species as well as understanding ecological and evolutionary relationships between living beings.
   The process of DNA barcoding includes two basic steps:
   (i) Collecting DNA barcode data of known species.
   (ii) Matching the barcode sequence of the unknown sample against the barcode library for identification.
3. The main applications of DNA barcoding includes protections of endangered species, preservation of natural resources, pest control in agriculture, identifying disease vectors, authentication of health products and identification of plants.

What is evolution? *(Can you tell? TB Pg. No.*

Ans.
1. Changes that happen in the biological pro over a period of successive generations are as evolution.
2. These characteristics are gene expressions passed on from parents to off-springs.
3. The process of evolution relies on the selection, genetic drift and sexual selection.

Enlist the uses of taxonomy. *(Can you tell? TB Pg.*

Ans.
1. The term taxonomy was first introduced by Candolle.
2. Taxonomy mainly aims at grouping organisms basis of mutual similarities into units known as
3. Another main objective of taxonomy is to each specific taxon a name.
4. Taxonomy also serves as a tool for the identific of bacteria.

Why horse and ass are considered to be two dis species or animals? *(Can you tell? TB Pg. No. 9)*

Ans.
1. Horses and ass look similar and have some thi common.
2. They are of two different species but they belo the same family Equidae and the genus *Equus*.
3. The scientific name of horse and ass is *caballus* and *Equus asinus* respectively.
4. They both have different numbers of chromo the total number of chromosomes in the hor and ass have 62 number of chromosomes.

Make a flow chart using taxonomic hierarchy. *(Can you tell? TB Pg. No. 9)*

The flow chart given below begins with the broadest to the most specific.

Kingdom → Phylum → Class → Order → Family → Genus → S

Horse (*Equus caballus*)	Ass (*Equus asinus*)	Horse (*Equus caballus*)	Ass (Equus
Kingdom – Animalia	Kingdom – Animalia	Family – Equidae	Family – E
Phylum – Chordata	Phylum – Chordata	Genus – *Equus*	Genus –
Class – Mammalia	Class – Mammalia	Species – *caballus*	Species
Order – Perissodactyla	Order – Perissodactyla		

TEXTBOOK EXERCISE

Pg. No 17 - 18

1. Choose correct option

A. Which of the following shows single stranded RNA and lacks protein coat?

(a) Bacteriophage (b) Plant Virus
(c) **Viroid** (d) Animal Virus

B. Causative agent of red tide is .....

(a) ***Dinoflagellete*** (b) *Euglenoid*
(c) *Chrysophyte* (d) Lichen

C. Select odd one out for Heterotrophic bacteria.

(a) Nitrogen fixing bacteria
(b) *Lactobacilli*
(c) **Methanogens**
(d) Antibiotic production

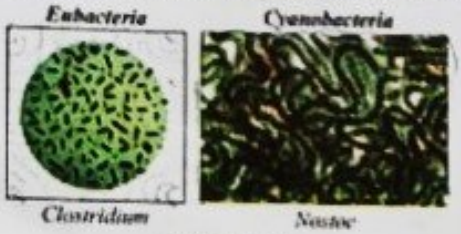
D. *Paramecium* : *Ciliated Plasmodium* : .....

(a) Amoeboid protozoan
(b) Ciliophora
(c) **Flagellate protozoan**
(d) Sporozoan

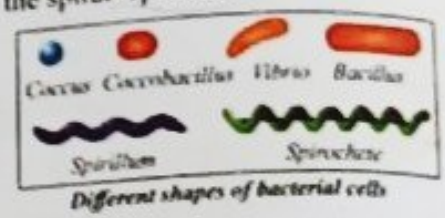
2. Answer the following questions

A. What are salient features of Monera? (OR)
(Can you tell? TB Pg. No. 11)

Ans. The salient features of kingdom Monera are :



1. Monera contains unicellular organisms with prokaryotic cellular organization.
2. These are omnipresent and are found in all types of environment which are not generally inhabited by other living beings.
3. Few are photoautotrophs or chemoautotrophs, but majority are heterotrophic in nature.
4. These organisms does not have well defined nucleus.
5. Cell wall is rigid and made up of peptidoglycan, also called as murein, which is polymers of sugars and amino acids.
6. Membrane bound organelles are absent.
7. Ribosomes are smaller (70 S) than in eukar...
8. The mode of reproduction in Monera is ... with the help of binary fission or budding ... sexual reproduction is by conjugation ...
9. Morphologically, bacteria are categ... four groups, the spherical-Coccus, the ... bacillus, the comma or kidney shaped ... the spiral- spirillum.



Different shapes of bacterial cells

B. What will be the shape of a *Bacillus* and Co... of bacteria? (OR) *(Can you tell? TB Pg. No. 11)*

Ans. *Bacillus* represents a rod like structure and ... represents a spherical structure respectively.

C. Why is binomial nomenclature important?

Ans.
1. A system of nomenclature of plants and ... which the scientific names consist of two ... called binomial nomenclature.
2. Carl Linnaeus used binomial system of nomen... which was introduced in the book '*Species Plan...*
3. Binomial nomenclature helps us to overcom... difficulties raised by common names; scientis... given scientific names to all the known organ...
4. Since these are systematic, it provides ma... international communication.
5. These names are simple, meaningful, precis... standard.
6. They are universally accepted.
7. Due to this system, confusion or uncertainty ca... by local or vernacular names is avoided.
8. The binomials are easy to understand and remem...
9. They indicate phylogeny i.e. evolutionary histo...
10. They help in establishing relationship bet... organisms and groups of organisms.

3. Write short notes

A. Useful and harmful bacteria. (OR)
(Can you tell? TB Pg. No. 11)

Ans.
1. Bacteria are considered as most useful microbe... human beings.
2. Some of the examples of helpful bacteria ... *Escherichia coli*, *Rhizobium* and *Streptomyces*.

3. *Escherichia coli* helps in digestion process.
4. Harmful bacteria include *Salmonella, Listeriosis* and *Escherichia coli*. Here, *E.coli* plays a major role in contamination of food.
5. Some of them are pathogens, that causes diseases.

Five kingdom system.

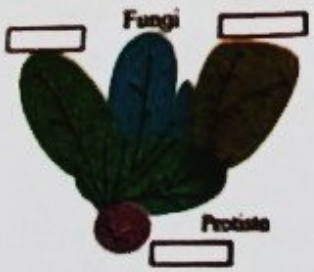
1. Carl Linnaeus classified the living organisms in two kingdoms based on the mode of nutrition, whether they are migratory/sedentary, etc.
2. But the broad classification of kingdom Plantae and kingdom Animalia was found to be in adequate.
3. Hence, to avoid confusion R. H. Whittaker (1969) proposed the five kingdom classification into Monera, Protista, Fungi, Plantae and Animalia.
4. This classification was based on mode of nutrition, phylogenetic relationships, body organization and cell structure.
5. Kingdom Monera included – Archaebacteria and Eubacteria.
6. Kingdom Protista mainly included fungi like Protista, Dinoflagellates, Euglenoids, Plant like Protista and Animal like Protista.
7. Kingdom Plantae into Crypotogams and Phanerogams.
8. Kingdom fungi to Phycomycetes, Ascomycetes, Basidiomycetes and Deuteromycetes.
9. Kingdom Animalia into Non-Chordates and Chordates.

C. Useful fungi.

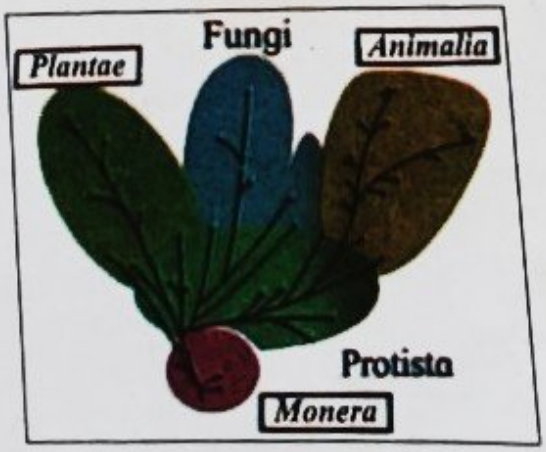
ns.

1. Fungi play a major role in agriculture by increasing the fertility of the soil, medicine yielding antibiotics and forming basis of several industries.
2. In medicine, fungi produce certain substances that help to cure diseases by microorganisms, known as antibiotics.
3. Industrial uses of fungi varies which include alcohol fermentation, enzyme preparations, organic acid production, gibberellins production and in cheese industry.

4. Complete tree diagram in detail.



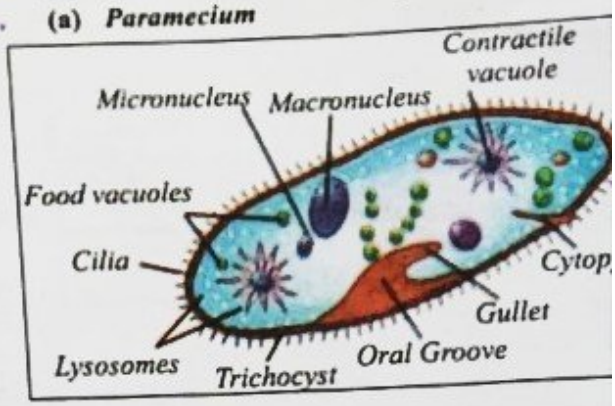
Ans.



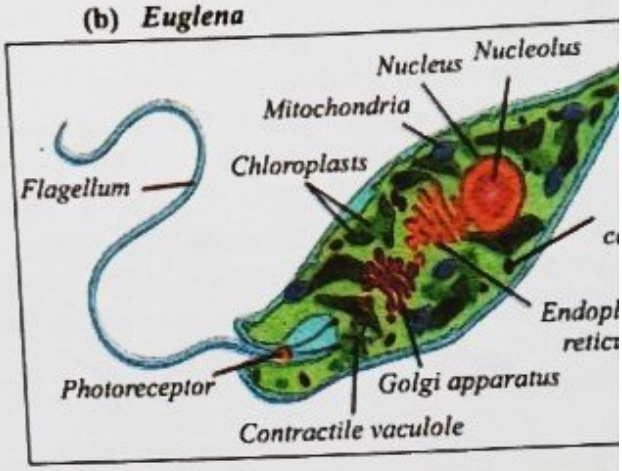
5. Draw neat labelled diagrams.

(a) *Paramecium*
(b) *Euglena*
(c) TMV

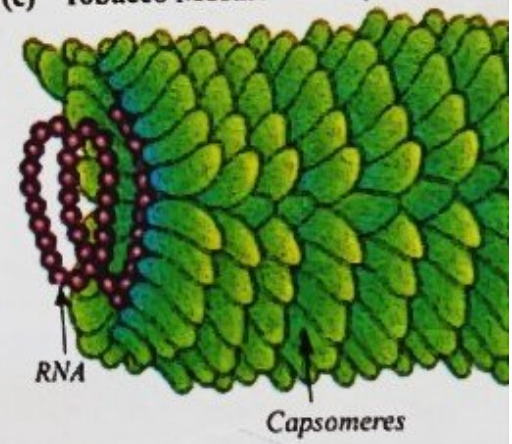
Ans. (a) *Paramecium*

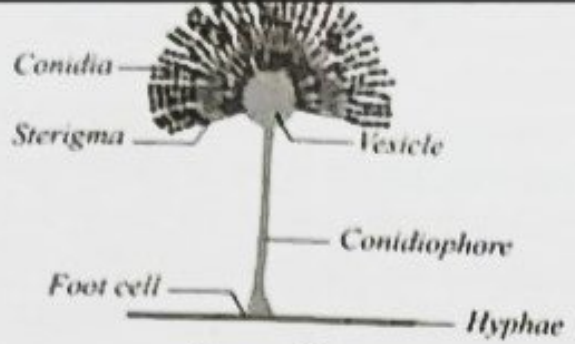


(b) *Euglena*



(c) Tobacco Mosaic Virus (TMV)





Aspergillus

1. It is sac fungi and is mostly multicellular.
2. The hyphae are branched and septate.
3. Sac fungi can be decomposers, parasites or coprophilous grow on dung.
4. Breathing in of *Aspergillus* spores may cause certain illness.

above answer, ***Helianthus*** indicates name of the genus and second word ***annuus*** denotes name of the species.

9. Match the following.

Kingdom	Examples
(i) Monera	(a) *Riccia*
(ii) Protista	(b) *Cyanobacteria*
(iii) Plantae	(c) *Rhizopus*
(iv) Fungi	(d) Diatoms

Ans. (i) - (b), (ii) - (d), (iii) - (a), (iv) - (c)

10. Complete the following

(i) Plant like Protista – Diatoms

(ii) Animal like Protista **– *Entamoeba***

Ans. (i) Plant like Protista – Diatoms

(ii) Animal like Protista – *Entamoeba*

INTEXT QUESTIONS

Pg. No 6 - 16

What is five kingdom system of classification?

(Can you recall? TB Pg. No. 6)

R. H. Whittaker proposed the five kingdom classification – Protista, Monera, Fungi, Plantae and Animalia. The classification was based on mode of nutrition, phylogenetic relationships, body organization and cell structure.

Which characters of organisms are visible characters?

(Can you tell? TB Pg. No. 7)

Ans.

1. The characters such as growth, reproduction and responsiveness to stimuli are the visible characters of an organism.
2. Increase in cell number and size is referred to as growth.
3. Similar to growth, organisms possess the ability to produce offspring.