BIOLOGY

Important Questions

Multiple Choice questions-

1. Agar is obtained from
   - **A.** Laminaria
   - **B.** Porphyra
   - **C.** Sargassum
   - **D.** Gelidium
2. Red algae resemble blue green algae in the presence of
   - **A.** Similar cell wall constitutents
   - **B.** Phycobilins
   - **C.** Similar reserve food
   - **D.** Similar mode of reproduction
3. The colour of brown algae is due to
   - **A.** Phycoerythrin
   - **B.** Phycocyonin
   - **C.** Fucoxanthin
   - **D.** Carotenes
4. All algae possess
   - **A.** Chlorophyll (b) and carotenes
   - **B.** Chlorophyll (a) and corotenes
   - **C.** Chlorophyll (a) and chlorophyll (c)
   - **D.** Chlorophyll (a) and chlorophyll (b)
5. Flagellate cells are absent in
   - **A.** Brown algae
   - **B.** Red algae
   - **C.** Green algae
   - **D.** Chlamydomonas.
6. Sex organs are unicellular and non-jacketed in
   - **A.** Algae

B. Bryophyta

C. Gymnosperms

D. Pteridophyta.

7. In green algae meiosis occurs in

A. Gametangia

B. Sporangia

C. Zoospore

D. Zygospore.

8. Protonema stage is found in

A. Green algae

B. Liveworts

C. Ferns

D. Mosses.

9. Pyrenoids are present in

A. Brown algae

B. Red algae

C. Green algae

D. Blue green algae.

10. Sporophyte of riccia is made of

A. Capsule only

B. Foot, seta and capsule

C. Seta and capsule

D. Foot and capsule.

11. A fern differs from a bryophyte in having.

A. Parasitic sporophyte

B. Independent gametaphyte

C. Independent sporophyte

D. Parasitic gametophyte.

12. Seedless vascular plants are

A. Mosses

B. Liver worts

C. Ferns

D. Cycads.

13. Gymnosperms are characterised by

A. Naked ovules

B. Large leaves

C. Scale leaves

D. Ciliated sperms.

14. Which of these algae is very rich in protein.

A. Ulothrix

B. Oscillatoria

C. Chlorella

D. Spirogyra.

15. Multicelluilar branched rhizoids and leafy gametophytes are found in

A. All bryophytes

B. Some bryophytes

C. Some pteridophytes

D. All pteridophytes

Fill in the blanks

1. In this chapter we will describe _____ under algae, _____ Pteridophytes, _____and angiosperms.
2. Such systems were _____because they separated closely related species since they were based on few characteristics.
3. At prasent _____based on evoiutionory relationships between the various organisms are acceptable.
4. Fusion between one large, _____ (static) female gemete and a smaller, motile male gamete is termed _____
5. Certain marine brown and red algae produce large amounts of hydrocolloids (water holding substances) e.g. _____ (of brown algae) and carrageen (of red algae) are used commercially.
6. The algae are divided into three main classes: _____ and _____
7. The plant body of _____is more differentiated than that of _____
8. The predominant stage of the life cycle of a moss is the gametophyte which consists of

_____

9. Each of the cells of an _____are haploid.
10. The _____and _____degenerate after fertilisation.
11. The dominant, photosynthetic phase in such plants is the _____the gametophyte. This kind of life-cycle is termed as _____
12. The gameto phytic phase is represented by the single to few celled haploid gametophyte. This kind of life-cycle is termed as _____
13. The diploid sporophyte is represented by a dominant, independent, _____vascular plant body.

True (T) or False (F)

1. Numerical Taxonomy which is now easily carried out using computer is based on ail the observable charateristics.
2. The algae reproduce by only vegetative methods.
3. At least a half of the total carbon-dioxide fixation on earth is carried out by algae through photosyntheses.
4. Algae are of paramount importance as primary producers of energy-rich compounds which form the basis of the food cycles of all aquatic animals.
5. The algae are divided into two main classes: Rhodophyceae and chlorophyceae.
6. Majority of the red algae are found on land with greater concentrations found in the warme areas.
7. The bryophytes are divided into: liverworts and mosses.
8. The liverworts grow usually in moist shady habitats such as banks of streams, marshy groun damp soil, bark of trees and deep in the woods.
9. The first stage is the leafy stage which develops from the secondary protonema as a lateral bud.
10. Water is required for transfer of antherozoids— the male gametes released from the antheridia, to the mouth of archegonium.
11. Unlike bryophytes and pteridophytes, in gymnosperms the male and the female gametophy have independent free-living existence.
12. Angiosperms provide us with food, fodder, fuel, medicines and several other commercially important products. They are divided into two classes: the dicotyledons and the monocotyledons.

Very Short Questions :

1. Define pyrenoid.

2. Define ramenta.
3. What is the function of mucilage in aquatic plants?
4. How much water can Sphagnum absorb?
5. What is the function of air vesicles in brown algae?
6. Why is Adiantum called a 'walking fern'?
7. Give one example of the monocarpic plant.
8. What are sori?
9. What are rhizoids?
10. Which pigments are found in green algae?

Short Questions :

1. Why are red algae able to survive in the deep-sea?
2. What are the features that have led to the success and dominance of vascular plants?
3. Define monopodial growth?
4. Why do marine algae have no mechanical tissue?
5. Explain the different types of sexual reproduction in green algae.
6. Why are seed plants considered the most successful land plants?
7. Give five distinguishing characteristics of red algae.
8. Discuss the development of seed habit.

Long Answer Type

1. What are angiosperms? Give their characteristic features.
2. Write brief notes on
3. Discuss the development of seed habit.
4. What are the different lifestyles shown by Angiosperms?

Assertion Reason Question-

1. In these questions, a statement of assertion followed by a statement of reason is given. Choose the correct answer out of the following choices.

   (a) If both Assertion and Reason are true and Reason is the correct explanation of Assertion.

   (b) If both Assertion and Reason are true but Reason is not the correct explanation of Assertion

   (c) If Assertion is true but Reason is false.

   (d) If both Assertion and Reason are false.

Assertion: Algae and fungi are grouped in thallophyta.

Reason: Algae and fungi show no differentiation in thallus.

2. In these questions, a statement of assertion followed by a statement of reason is given. Choose the correct answer out of the following choices.

(a) If both Assertion and Reason are true and Reason is the correct explanation of Assertion.

(b) If both Assertion and Reason are true but Reason is not the correct explanation of Assertion

(c) If Assertion is true but Reason is false.

(d) If both Assertion and Reason are false.

Assertion: Chlorella could be utilised to keep the air pure in space vehicles.

Reason: The space travelers feed on Chlorella soup.

Case Study Based Question-

1. Direction Read the following and answer the questions that follow

Algae are diverse group of aquatic organisms that have the ability to conduct photosynthesis. They are unicellular or multicellular and undifferentiated organisms that occur in variety of forms and sizes. Algae belong to a polyphyletic group, i.e. the organisms of this group are not necessarily related to each other. Based on the pigment, composition and reserved food material, algae has been divided into three major classes, viz. Chlorophyceae, Phaeophyceae and Rhodophyceae.

The members of these classes also differ in cell wall composition, stored food material, body structure, mode of reproduction, etc.

(i) A representative organism of class- Rhodophyceae is

(a) Spirogyra

(b) Fucus

(c) Polysiphonia

(d) Chlorella

(ii) Multicellular, saline forms are found in

(a) Rhodophyceae

(b) Chlorophyceae

(c) Phaeophyceae

(d) All of the above

(iii) Stored food material in class– Phaeophyceae is

(a) mannitol and laminarin

(b) floridean starch

(c) pyrenoids

(d) All of the above

(iv) Cell wall of Porphyra (red algae) contains

(a) cellulose

(b) pectins

(c) polysulphate esters

(d) All of these

(v) Consider the following statements.

I. Large amounts of hydrocolloids are produced by certain marine red and brown algae.

II. Algin and carrageenan are commercially used as water holding materials.

Choose the correct option.

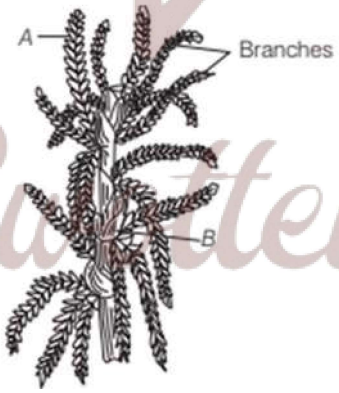
(a) Statement I is correct, but II is incorrect

(b) Statement I is incorrect, but II is correct

(c) Both statements I and II are correct

(d) Both statements I and II are incorrect

2. Identify the given bryophyte and answer the questions as follows



(i) Which of the following statements are correct for the given bryophyte species above.

I. The given diagram represents Sphagnum gametophyte.

II. The given species is a liverwort.

III. It provides peat.

IV. Scales and elaters are not found in it.

Codes

(a) II and III

(b) I and IV

(c) II, III and IV

(d) I, III and IV

(ii) A bryophyte found in dry habitat is

(a) Polytrichum

(b) Marchantia

(c) Riccia

(d) All of these

(iii) The thallus of bryophytes

(a) possesses roots

(b) bears very small leaves

(c) is more differentiated than that of algae

(d) All of the above

(iv) The female sex organ in bryophytes is

(a) conspicous and reduced

(b) flask-shaped structure of thallus

(c) called sporophyll

(d) Both (a) and (b)

(v) Marchantia is a bryophyte used to cure

(a) lung infection

(b) skin rashes

(c) joint pain

(d) All of these

ANSWER KEY –

➢ Multiple Choice Answer :

1. Gelidium
2. Phycobilins
3. Fucoxanthin.
4. (b) Chlorophyll (a) and carotenes.

5. Red algae.
6. Algae.
7. Zygospore.
8. Mosses.
9. Green algae.
10. Capsule only.
11. Independent sporophyte.
12. Ferms.
13. Naked ovules.
14. Chlorella.
15. Some bryophytes.

➢ Fill in the blanks :

1. Plantae, Bryo- phytes, Gymnosperms
2. artificial
3. Phylogenetic classification systems
4. non-motile, oogamous
5. algin
6. Chlorophyceae, Phaeophyceae, Rhodophyceae
7. Bryophytes, algae
8. two stages.
9. embryo-scarsac
10. ynergids, antipodals
11. free-living, haplontic
12. Diplontic

➢ Write true (T) or false (F) :

1. True
2. False
3. True
4. True
5. False

6. False
7. True
8. True
9. False
10. True
11. False
12. True

➢ Very Short Answer :

1. Pyrenoid is a starch storing organelle present in green algae.
2. The hair-like structure present on the younger stem, petiole, and rachis of mature leaves is known as ramenta.
3. Mucilage protects the algae from epiphytic growth and the decaying effect of water.
4. Sphagnum can absorb water up to 18 times its weight.
5. The air vesicles in brown algae maintain buoyancy.
6. Adiantum is known as 'walking fern' because the leaf tips come in contact with the soil, They strike adventitious roots and develop into a new plant.
7. Bamboo.
8. They are groups of separation found in Dryopteris fern.
9. They are slender unicellular or multicellular hair-like structures that penetrate in the moist soil and absorb the water for the plants.
10. Chlorophyll 'a' and 'b' and 'Beta' carotene.

➢ Short Answer :

1. Red algae contain phycoerythrin and phycocyanin pigments. Phycoerythrin is able to absorb the blue wavelengths of light and thus can photosynthesize. Since red algae can utilize blue and green rays they can live at greater depths.

2. (1)Development of deep penetrating roots to anchor the plant in soil and absorb water and minerals for the plants from the deeper layers of the soil.

(2)Development of cutin as a waterproof layer on leaves to reduce transpiration.

(3)Development of mechanical tissue to provide support.

(4)Development of a well developed vascular system.

3. When the main axis of the trunk rises straight from the base and reaches up to the tip, this type of growth is known as monopodial growth.

4. Marine algae have no mechanical tissue because buoyancy holds them erect under the sea surface.
5. Sexual reproduction in green algae can be of three different types:

   1.Isogamy: Both the fusing gametes are morphologically and physiologically similar.

   2.Anisogamy: The fusing gametes are structurally similar but differ in size and behaviour.

   3.Oogamy: The female gamete is bigger, food-laden and non-motile, whereas the male gamete is smaller, without food reserve and motile.

➢ Long Answer :

1. Growth Unicellular and multicellular organisms increase their mass and number through cell-division. Non-livings increase their size by the accumulation of matter.

   a) Cell has protoplasm which is living matter. Cell before division increases their mass through replication of genetic matter. It is absent in non-livings.

   b) Metabolic Activity: Anabolic and catabolic reaction constantly occurs in living organisms, formation and conversion of biomolecules is metabolism.

'In Vitro, such reactions can be maintained. In non-living, there is the absence of metabolism.

2. For classification, systematic studies have to carried out.

   1. First, the organisms have to be described for all their morphological and other characteristics.
   2. Based on its characteristic, it is seen whether it is similar (or different) to any known group or taxa-identification is carried out.
   3. Based on its similar characteristic it is then placed in known taxa or the organism is classified. Sometimes organisms are very different from the ones already described anywhere in the world, then they are placed in a new group or 'taxa' and named.
   4. Once the organism has been placed in the right taxa-the last step is nomenclature or naming. If the organism is already known-its the correct name is determined. If an organism is not described before-it is given a new name.

3. The seed plants have two kinds of sporangia. These sporangia are born on the sporophylls.

   One type of sporangia are ovule or megasparangium. The other type of sporangia is the pollen s or archegonium. The egg develops a pollen sac or microsporangium. The egg develops in the ovule from the megaspores. Many pollen grains are produced in the pollen sac.

   The pollen grains are dispersed by the air! They reach the ovule. The male gamete and the female egg cell fuse together. The zygote is formed as a result of fertilization. Later on, the zygote forms the embryo. The seed is developed from the ovule. The development of seed habit in gymnosperm and angiosperm do not require liquid water during fertilization.

4.

1. Hydrophytic plants are the plants that live in water or swampy places. Hydrophytes are categorised into, two groups:
   (a) Submerged plants like Hydrilla, Vallisneria, Utriculria and
   (b) Floating plant-like Nymphea, Wolffia and Pistia.
2. Xerophytic plants are those plants that live in the scarcity of water e.g. cactus.
3. Halophytes are a type of xerophytic plants that are present in saline conditions.
4. Insectivorous plants-A few angiosperms, though green and autotrophic trap insects to overcome the shortage of nitrogen. For example, pitcher plant, sundew, bladderwort.

Assertion Reason Answer-

1. (a) If both Assertion and Reason are true and Reason is the correct explanation of Assertion.

   Explanation: On the basis of

   (i) Thallus like non-vascular plant body.

   (ii) Simple, unicellular non-jacketed sex organs and

   (iii) No embryo development after gametic union, the algae and fungi have long been grouped together in thallophyta. The algae and fungi are the result of parallel development and do not indicate any phylogenetic relationship.

2. (b) If both Assertion and Reason are true but Reason is not the correct explanation of Assertion

   Explanation: Chlorella could be utilised to keep the air in space vehicles pure and supply food in space stations and prolonged space flight trips. The space travellers could feed on Chlorella soup. It is nourishing but not appetizing food.

Case Study Answer-

1. Answer:

(i) (c)

(ii) (a)

(iii) (a)

(iv) (d)

(v) (c)

2. Answer:

(i) (d)

(ii) (a)

(iii) (c)

(iv) (b)

(v) (a)