

Algae

One mark questions:

- a. Why is *Chara* called a stonewort?
- b. What is the main pigment of Phaeophyceae?
- c. Name one alga where heterocyst is present.
- d. Name an alga showing triphasic life cycle.
- e. Name two pigments of Cyanophyceae.
- f. Name pigments of Cyanophyceae responsible for blue green colour.
- g. Name the storage material of Phaeophyceae.
- h. Example of Rhodophycean alga.
- i. Name of an alga used as single cell protein.
- j. What is clump formation?
- k. What is Floridian starch?
- l. Name one cyanobacterium used as food.
- m. What is the reserve food material Phaeophyceae?
- n. What is pyrenoid?
- o. What is the main pigment of Rhodophyceae?
- p. Alga with murein in the cell wall.
- q. What is diatomite?
- r. What is kelp?
- s. Name one blue green alga used as food.
- t. What is Gaidukov phenomenon?
- u. Name one algal toxin and its source.
- v. What is carrageenan?
- w. What is heterocyst?

Five marks questions:

1. Uses of algae with examples.
2. Characters of Phaeophyceae.
3. Characters of Rhodophyceae.
4. Male reproductive structure of *Chara*.
5. Female reproductive structure of *Chara*.
6. Differentiate between Cyanophyceae and Chlorophyceae.
7. Similarities and dissimilarities between Chlorophyceae and Charophyceae.
8. Role of algae as food.
9. Characters of Chlorophyta. Male and female reproductive structures of *Chara*.
10. What is diatomite? Industrial uses of diatomite.
11. Name the source and its class form where these commercial products are obtained:
 - I. SCP
 - II. Carrageenan
 - III. Biofertilizer
 - IV. Alginic acid
 - V. Agar-agar

Ten marks questions:

1. Salient features of Rhodophyceae and Phaeophyceae. Word diagram of alternation of generations.
2. Salient features of Rhodophyceae and Phaeophyceae. Name one genus from each.
3. Structure of globule of *Chara*. Economic importance of algae.
4. Vegetative structure of *Chara* with diagrams. Word diagram of isomorphic alternation of generations.
5. Vegetative structure of *Chara*. What is isomorphic alternation of generations? Sexual reproduction of *Ectocarpus* with diagrams.
6. Sexual reproduction of *Ectocarpus* with diagrams. Name one Indian species of Alga and mention the type of alternation of generation found in that genus.
7. Vegetative structure of *Chara*. Life cycle of *Ectocarpus* with diagrams.
8. What is isomorphic alternation of generations and where is it found? Compare unilocular and plurilocular sporangia. Describe structure of nucule of *Chara* with illustrations.
9. Diagnostic features of Cyanophyceae. Comparison between Cyanophyceae and Rhodophyceae.

10. Draw and describe internal structure of male sex organ of *Chara*. Compare unilocular and plurilocular sporangia. Uses of Algin.
11. Sexual reproduction in *Chara*. Why is it called progenitor of land plants.
12. Sexual and asexual reproduction in *Ectocarpus*.

Character	Chloropyceae	Phaeophyceae	Rhodophyceae	Cyanophyceae	Charophyceae
Thallus form	Unicellular, colonial or filamentous, siphonaceous or thalloid	Filamentous branched or usually heterotrichous	Unicellular, filamentous, pseudoparenchymatous	Unicellular colonial or filamentous	Macroscopic, filamentous, multicellular
Cell structure	Eukaryotic	Eukaryotic	Eukaryotic	Prokaryotic	Eukaryotic
Pigment	Chlorophyll a & b, alpha- and beta-carotene, Xanthophyll	Chlorophyll a & c, beta-carotene Xanthophyll (Violaxanthin and fucoxanthin)	Chlorophyll a and d, beta-carotene, xanthophylls and r-phycoerythrins	Chlorophyll and beta-carotene xanthophyll and c-phycoyanins	Chlorophyll a & b
Cell wall	Cellulosic & Pectic material	Outer layer contains alginic & fucinic acid & the inner layer is of cellulose	Outer layer is pectin & inner layer is cellulose	Mucopeptides and muramic acid	Cellulosic & Pectic material
Reserve food material	Starch & fats	Laminarin, mannitol & sucrose	Floridean Starch	Cyanophycean starch & protein	Starch
Flagella	Present	Present	Absent	Absent	Present
Flagella type	Acronematic	Acronematic & Pantonematic	-	-	Acronematic
Pont of insertion	Anterior	Lateral	-	-	Anterior
Length	Equal	Unequal	-	-	Equal
Asexual reproduction	Fragmentation Zoospores aplanospores Akinetes	Motile Zoospores aplanospores	Monospores, neutral spores, tetraspores, carpospores	Fragmentation akinetes, hormogonia, endospores, exospores	Fragmentation
Sexual reproduction	Isogamy Anisogamy & Oogamy	Isogamy Anisogamy & Oogamy	Complex & Advanced oogamy	Absent	Oogamous
Examples	<i>Volvox</i> ,	<i>Ectocarpus</i> , <i>Fucus</i> , <i>Dictyota</i> , <i>Laminaria</i>	<i>Nemalion</i> , <i>Ploysisiphonia</i>	<i>Nostoc</i> , <i>Anabaena</i> , <i>Rivularia</i>	<i>Chara</i> , <i>Nigella</i>

	<i>Ulothrix, Spirogyra, Vaucheria, Chlorella</i>				
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Fungi

One mark questions:

- a. Name one fungus from Deutromycotina. ***Penicillium chrysogenum, Aspergillus niger***
- b. Name one antibiotic producing fungus. ***Penicillium chrysogenum***
- c. Name one poisonous lichen. ***Letharia vulpine* (wolf lichen)**
- d. What is mycorrhiza?
- e. Name one edible fungus. ***Agaricus bisporus***
- f. Name one fruticose lichen. ***Usnea***
- g. What is VAM? ***Vesicular arbuscular mycorrhiza***
- h. Name a fungus used in alcohol production. ***Saccharomyces cerevisiae***
- i. What is chlamyospore? **A chlamyospore is the thick-walled, big hyphal cell which acts as a resting spore of several kinds of fungi.**
- j. What is the main component of fungal cell wall. **Chitin**
- k. Name one fungus from Mastigomycotina. ***Allomyces***
- l. What is coprophilous fungus? **Which grow on animal dung**
- m. Example of foliose lichen. ***Parmelia***
- n. What is coenocytic mycelium?
- o. What is dolipore septum?
- p. Name one crustose lichen. ***Rhizocarpon***
- q. What is papulospore?
- r. What is inoculum? **a small, asexual, indehiscent sclerotium-like structure differentiated into central and sheathing cells**
- s. What is mitosporic fungi? **A group of fungi that reproduce only asexually. The mitosporic fungi undergo mitotic division to produce microscopic asexual spores. Members of Deutromycotina**
- t. Name one fruticose lichen found in India. ***Cladonia crispata***
- u. What is Zygosporangium?
- v. What is dikaryon?
- w. Name two edible mushrooms. ***Agaricus bisporus, Agaricus arvensis***
- x. Name one dye yielding lichen. ***Parmelia saxatilis***
- y. Name one edible fungus under Basidiomycotina. ***Agaricus bisporus***

Five marks questions:

1. Describe sexual reproduction in *Rhizopus*.
2. Role of mycorrhiza in agriculture and Forestry.
3. Economic importance of lichen.
4. Types of lichen.
5. Importance of Mycorrhiza.
6. Ecological significance of lichen.
7. Mention characters of Basidiomycotina.
8. Structure of ascocarp of *Ascobolus*.

Ten marks questions:

1. Different types of lichens based on external morphology with examples. Four different types of uses of lichen.
2. Diagnostic characters of Ascomycotina. Describe with diagram structure of ascocarp of *Ascobolus*.
3. Describe fruiting body of *Ascobolus*. Mention characters of Deutromycotina. Name two members.
4. Sexual reproduction of *Ascobolus*. Name a fungus from Zygomycotina. What is sheathing mycorrhizza? What is an anamorphic fungus?
5. Describe with diagrams sexual reproduction in *Rhizopus*. Give differences between ascus/ ascocarp and basidium/ basidiocarp.
6. Mention characters of Deutromycotina. Describe with diagrams asexual reproduction in *Rhizopus*.
7. What is mycorrhizza? Role of mycorrhizza in agriculture and Forestry. Significance of lichen.
8. Mention characters of Oomycotina, Zygomycotina and Mastigomycotina with examples. Discuss one economic importance of fungus belonging to Ascomycotina.
9. Salient features of Zygomycotina. Discuss two economic importances of Fungi.

Bryophytes

One mark questions:

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| a. What is the common name of plants belonging to Hepaticopsida? | l. Where is operculum found? |
| b. What is the function of elaters? | m. What is pseudoelater? |
| c. Name one Indian species of <i>Funaria</i> . | n. What is prothallus? |
| d. What is perichaetial leaf? | o. What is exostome? |
| e. What is gemma cup? | p. What is endostome? |
| f. One difference between rhizoids and scales. | q. Name one Indian species of <i>Marchantia</i> . |
| g. What is elater? | r. What are amphibian plants and why are they called so? |
| h. Name a bryophyte important in ecological succession. | s. Function of peristome teeth. |
| i. Common name of members of Antocerotopsida. | t. Name one moss used in pollution monitoring. |
| j. Name one bryophyte where elater is found. | u. One advanced character of Antocerotopsida. |
| k. What is operculum? | |

Five marks questions:

1. Ecological significance of bryophytes.
2. Diagnostic characters of Bryopsida.
3. Diagnostic characters of Anthocerotopsida. Cite an example of hornworts of Indian origin.
4. Diagnostic characters of Hepaticopsida/ liverworts.
5. Structure of archegoniophore of *Marchantia* with diagram.
6. Structure of antheridiophore of *Marchantia* with diagram.
7. Compare salient features of Anthocerotopsida and Hepaticopsida.
8. Compare salient features of Bryopsida and Hepaticopsida.
9. Briefly describe role of elaters.
10. Why bryophytes are called amphibians of plant world? Mention two differences between bryophytes and algae.

Ten marks questions:

1. Comparative account of sporophyte of *Marchantia* and *Funaria* with diagrams.
2. Comparative account of sporophyte of *Marchantia* and *Funaria*. Which one is advanced between these and mention its two advanced features.
3. Internal structure of *Marchantia* thallus. Structure of *Funaria* sporophyte.
4. Diagnostic characters of Bryopsida. Draw and describe gametophyte of *Funaria*. Describe structure of sporophyte of *Marchantia*.
5. Amphibian characters of Mosses. Describe with diagrams the structure of the sporophytic plant of Bryopsida. What is protonema and where is it found?
6. Why bryophytes are called amphibians of plant world? Describe structure of sporophyte of *Marchantia*.
7. Diagnostic characters of Hepaticopsida. Draw and describe gametophyte of *Funaria* and discuss its spore dispersal mechanism.
8. Diagnostic characters of Anthocerotopsida. Mention its differences from bryopsida. Discuss the role of peristome teeth in dispersal of spores in *Funaria*.

Class	Features of gametophyte	Features of sporophyte	Important members
Hepaticopsida (Liverworts)	<ul style="list-style-type: none"> a. Both thalloid and leafy genera b. unicellular rhizoids c. Most cells have numerous chloroplasts d. Produce gemmae e. Protonema stage in some f. Pores in some thalloid types 	<ul style="list-style-type: none"> a. Small and nutritionally dependent on gametophyte; unbranched b. Consists of only sporangium in some genera, and of foot, short seta, and sporangium in others c. Elaters present d. Lacks stomata 	
Bryopsida (Mosses)	<ul style="list-style-type: none"> a. Leafy genera b. Multicellular rhizoids c. Most cells have numerous chloroplasts d. Some produce gemmae e. Protonema stage present f. Some species have leptoids and nonlignified hydroids 	<ul style="list-style-type: none"> a. Small and nutritionally dependent on gametophyte; unbranched b. Consists of foot, long seta, and sporangium c. Elaters absent d. Stomata present e. Some species have leptoids and nonlignified hydroids 	
Anthocerotopsida (Hornworts)	<ul style="list-style-type: none"> a. Thalloid genera b. unicellular rhizoids c. Most have single chloroplast per cell d. No gemma 	<ul style="list-style-type: none"> a. Small and nutritionally dependent on gametophyte; unbranched b. consists of foot and long, cylindrical sporangium with a 	

	e. No protonema	meristem between foot and sporangium c. cuticle present d. Pseudoelaters present e. stomata present f. no specialized conducting tissues	
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Plant pathology

One mark questions:

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| <ul style="list-style-type: none"> a. What kind of symptom is blight? b. Name one Pathotoxin. c. What is biotroph? d. What is syndrome? e. Name the causal organism of black stem rust of wheat. f. Name one heterocious fungal pathogen. g. What is necrosis? h. What do you mean by hypoplastic symptom? | <ul style="list-style-type: none"> i. What is disease triangle? j. What is incubation period? k. What is inoculum l. What is the secondary host of Black Stem Rust of wheat? m. Define symptom and sign of a disease. n. What is aflatoxin? |
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Five marks questions:

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| <ul style="list-style-type: none"> 1. Write short note on Koch's postulates. Importance 2. Pathotoxin 3. Phytoalexin 4. Different types of hyperplastic symptoms. 5. Difference between hypoplastic and hyperplastic disease symptoms. | <ul style="list-style-type: none"> 6. Biotroph, necrotroph and disease triangle. 7. What is mycotoxin? Write note on aflatoxin. |
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Ten marks questions:

1. Name the causal organism of Black Stem Rust of wheat. State the symptoms, disease cycle and control measures of the disease.
2. Name the causal organism of Late blight of potato. State the symptoms, disease cycle and control measures of the disease.
3. Mention the different types of necrotic disease symptoms. Describe the disease cycle and control measures of Black Stem Rust of wheat.
4. What is disease triangle? Discuss the main characteristics of phytoalexins and comment on its role on plant defence. Write the control measures of a heterocious fungal pathogen.
5. What is meant by necrotic, hyperplastic and hypoplastic symptoms? To which category symptoms of late blight of potato belong? Discuss the control measures.