AP-PGCET-2024

BOTANY-STUDY MATERIAL ON "ALGAE"-II

Spirogyra

1) *Spirogyra* is an unbranched green filamentous alga found floating in fresh water ponds.
2) It is known as pond scum or water silk or Pond silk or Mermaids tresses or Blanket weed.
3) In this genus, more than 400 species are found.
4) The filament consists of green cylindrical cells placed end to end.
5) The cells are usually longer than broad.
6) All the cells of a filament are alike except in some attached forms e.g., *S. adnata*, *S. jogensis*, where the basal cells develop rhizoidal outgrowths in the form of Hapteron.
7) These basal non-green cells are also called Hold- fast / Hapteron.
8) Some species are attached to substratum by means of rhizoids. Ex- *S. Rhizopus, S. dubia.*
9) Outer layer of cell wall is made up of Pectin(forms mucilage),Inner is made up of Cellulose.
10) The cytoplasm is in the form of a thin peripheral layer (primordial utricle).
11) All the green cells of filament are capable of division except Hold fast.
12) There is a large central vacuole bounded by tonoplast.
13) Cytoplasm also has many small sized contractile vacuoles, which play role in shrinkage of protoplasm during conjugation.
14) A cell contains 1- 16 left handed spirally coiled ribbon shaped chloroplasts. This is a feature from which the genus takes its name.
15) Each chloroplast bears a linear row of pyrenoids.
16) The nucleus is suspended in the central vacuole by means of cytoplasmic strands.

Reproduction: *Spirogyra* reproduces by 1) Vegetative 2) Asexual 3) Sexual methods.

17) Vegetative reproduction It multiplies vegetatively by Fragmentation during rainy season.
18) Asexual reproduction is rare and occurs by 1) Aplanospores Ex- *S.aplanospora* 2) Akinetes, Ex- *S. farlowii* 3) Azygospores Ex- *S.rhizoides.*
19) Sexual reproduction Sexual reproduction occurs through Conjugation or coming together of gametangia. Gametes are morphologically similar (Isogamy) but physiologically different (physiological anisogamy).

20) Conjugation is of two main types – 1) Scalariform conjugation 2) Lateral Conjugation.
21) Scalariform conjugation: Usually It occurs in Dioecious species.
22) In this, two filaments are involved. A transverse conjugation tube is formed between two cells. The two filaments secrete mucilage which binds them together & looks like a Ladder.
23) One gamete called male gamete is more active. It passes through the tube and fuses with female gamete to form Zygote(2n).
24) The diploid zygote develops a wall around it and forms a resting zygospore(2n).
25) Lateral conjugation: It occurs in Monoecious species.
26) In lateral conjugation two adjacent cells of the same filament function as gametangia. It is of 2 types.
1) Indirect lateral conjugation 2. Direct Lateral conjugation.
27) Indirect lateral conjugation: In this, a conjugation tube is formed between two adjacent Cells/gametangia of same filament. Ex- *S. affinis.*
28) Male gamete moves through conjugation tube into female gametangium & fuses with female gamete to form zygote.
29) Direct Lateral conjugation: Direct lateral conjugation occurs in attached species. It was first reported by M. O. P. Iyengar in *S. jogensis.*
30) In this, Two cells immediately next to the basal cell show direct lateral conjugation.
31) The lower cell becomes swollen and acts as female cell/gametangium.
32) The upper cell of female cell/gametangium acts as a male cell/gametangium.
33) In this type, a pore is formed in the common septum of two adjacent cells/gametangia.
34) Male gamete moves through the pore into the female gametangium & fuses with female gamete to form zygote(2n).
35) The diploid zygote develops a wall around it and forms a resting zygospore(2n).
36) Under favourable conditions, the zygospore germinates.
37) The diploid nucleus of Zygospore undergoes meiosis forming four haploid nuclei. Three degenerate and protoplast with the remaining haploid nucleus grows in size, breaks the zygospore wall and comes out as a germ tube. The germ tube develops into a filament.
38) Life cycle is Haplontic.
39) Parthenogenesis. In rare cases the gametes fail to fuse, round off and secrete a cell wall around and behave as spores. Such spores are called Parthenospores or Azygospores(n). Ex:- *S. rhizoides*
40) In general parthenogenesis is a form of reproduction in which the gametes develop into a Zygote(n) without fusion of gametes.

Classification of *Spirogyra*

Kingdom – Plantae
Sub-kingdom – Cryptogamae
Division – Thallophyta
Sub-Division – Algae
Class – Chlorophyceae
Order – Conjugales
Family – Zygnemataceae

Classification of *Oedogonium*

Kingdom – Plantae
Sub-kingdom – Cryptogamae
Division – Thallophyta
Sub-Division – Algae
Class – Chlorophyceae
Order – Oedogoniales
Family - Oedogoniaceae

Oedogonium

OCCURRENCE:

1) Oedogonium (Gr. Oedos = swelling; gonos = reproductive bodies) is a fresh water filamentous algae with more than 400 species.
2) It grows in permanent water bodies, such as ponds, lakes and shallow tanks. The filaments are attached to rocks, logs etc. or epiphytic on aquatic plants and other algae. On maturity, the filaments become free-floating.
3) Some species are terrestrial, growing on moist soils. e.g. *O.terrestris, O.randhawa*.
4) The common Indian species are *O. armigerum, O. cardiacum, O. aerolatum, O. aster and O. elegans.*

THALLUS STRUCTURE

5) The thallus of Oedogonium is multicellular and filamentous.
6) The filaments are unbranched and uniseriate.
7) All the cells of the filament, except the basal and apical ones, are cylindrical and alike. The cells are slightly swollen at their upper ends.
8) These cells possess one or more striations at their apical ends called 'Apical caps'.
9) The basal cell, which acts as holdfast, is devoid of chloroplast.

Cell Structure:

10) The cells are cylindrical in shape with a slightly swollen upper end.
11) The cell wall is made up of three layers. Outer chitin, middle pectin and inner cellulose.
12) The centre of the cells is occupied by a large vacuole.
13) The chloroplast is reticulate, extending in the form of a sheet throughout the protoplast.

14) Many pyrenoids are present at the intersections of the reticulum.
15) The cells are Uninucleate and the nucleus lies in the middle region of the cell
16) A characteristic feature of the *Oedogonium* is the presence of distinctive transverse bands at the distal ends of some cells. This band is formed at the time of cell division, and is known as Apical cap. The cell with an apical cap is called Cap cell.
17) Growth in Oedogonium takes place as a result of divisions in the intercalary cells.
18) All cells of the filament, except holdfast and apical cell, are capable of division, but divisions are confined to only few cells.
19) Only the Cap cells with cap - like apical rings divide again.
20) After each division a new cap is formed. Therefore, the number of caps on a cell indicates the number of times a cell has divided.

REPRODUCTION:

21) It takes place by Vegetative, Asexual and Sexual methods.

Vegetative reproduction:

22)Fragmentation is the usual method of propagation in free floating forms. Attached forms rarely multiply by fragmentation.
23) Asexual reproduction: Usually it takes place by Multi flagellated Zoospores during favourable conditions and occasionally by Akinetes during unfavourable conditions.
24) Sexual reproduction: Sexual reproduction is Oogamous.
25) The male sex organs are Antheridia and the female sex organs are Oogonia.
26) Two types of species are recognised based on the type of filament on which antheridia develop.
They are (1) Macrandrous species and (2) Nannandrous species.
27) Macrandrous species: Antheridia are formed on filaments of normal size.
28) They may be Monoecious producing Antheridia and Oogania on the same plant. *O. fragile, O. nodulosum*
29) In Dioecious species, Antheridia and Oogonia are formed on different filaments. Ex- *O. gracillis, O. aquaticum.*
30) Nannandrous species: These are always Monoecious and Dimorphic.
31) The filaments bearing antheridia and Oogonia show-morphological distinction.
32) The oogonia are formed in filaments of normal size, where as antheridia are produced in reduced male filaments called Dwarf males or Nannandria.
33) Nannandria are formed from Androspore always found attached to oogonia proper or to the underlying cell.
34) Antheridia: Antheridia are formed in either terminal or intercalary cell of the filament.

35) Each antheridium gives rise to 1 or 2 Antherozoids.
36) The antherozoid is unicellular, uninucleate and multi flagellate. It is similar to zoospore but smaller in size.
37) Oogonia: The protoplast of Oogonium changes into a single uninucleate, non motile egg. 38) A filament that bears both Androsporangia and Oogonia is called as Gynandrosporous while the filament that bears only Androsporangia is termed Idioandrosporous.
39) Fertilization: The antherozoid enters into the Oogonium through a pore of Oogonium and fuses with the egg & forms Oospore or zygote.
40) The Oospore is red in color and it secretes 2-3 layered wall around it.
41) After one year, the nucleus of the zygote divides by Meiosis resulting in 4 Haploid Multi flagellated Zoospores are formed.
42) When the wall of the zygote ruptures, the zoospores are liberated and grow into haploid *Oedogonium* plants.
43) In dioecious species two zoospores develop into male and two into female filaments. Ex- *0. Plagiostomum*.
44) LIFE CYCLE: The life cycle is known as Haplontic, because the plant is always haploid. The only diploid stage is the zygote.

Ectocarpus

OCCURRENCE

1) Species of *Ectocarpus* (Gr. Ektos = external; Karpos = fruit) are cosmopolitan in distribution, growing in the littoral and sub littoral zones of Atlantic & Pacific oceans.
2) Epiphytic species like *E.tomentosus, E. coniferus and E. breviarticulans*, grow on larger Brown algae like *Fucus* and *Laminaria.*
3) *Ectocarpus fasciculatus* is an epizoic species and grow on fins of fishes in Sweeden.
4) *E. coniger* and *E. spongiosus* and *E. simpliciusculus* are the free-floating forms.
5) The genus in India is represented by about 16 species. Of these, *E. coniferus, E coniger, E. indicus, E. geminifructus* are more common.

THALLUS STRUCTURE

6) The plant body of *Ectocarpus* is macroscopic, multicellular, filamentous and branched. It shows Heterotrichous habit i.e. it is differentiated into a prostrate rhizoidal system and an erect branched system.
7) The erect part of the thallus is in the form of crowded tuft of branches arising from the prostrate branches. they appear dichotomous.
8) The filaments are several centimeters long and one cell in thickness (monosiphonous).
9) The ultimate branches end in a point or taper into colorless hair like trichomes.
10) The erect branches exhibit diffuse growth by the activity of basal or intercalary meristem.

CELL STRUCTURE

11) Filaments of *Ectocarpus* are made up of uninucleate rectangular or cylindrica cells, placed one above the other.
12) The cell wall is differentiated into an outer gelatinous layer and an inner cellulose layer.
13) The gelatinous layer is mainly composed of Algin and Fucoiden, characteristic of phaeophycean cell wall.
14) Each cell is uninucleate.
15) It possess one or more irregular discoid or ribbon- shaped Chromatophores.
16) Each chromatophore is golden brown in color and contains a brown carotenoid pigment Fucoxanthin in addition to Chlorophyll-a, Chlorophyll-c, carotenes and xanthophylls.
17) There are naked projecting pyrenoids on the chromatophores.
18) The reserve food material is oil, Mannitol and Laminarin, but not starch.
19) The cytoplasm contains one or more small vacuoles with polyphenol. These vacuoles are called Physodes and they probably function like lysosomes.

REPRODUCTION

20) *Ectocarpus* reproduces by Asexual and Sexual methods.
21) Plants of *Ectocarpus* are of two types namely 1. The diploid sporophyte 2. The haploid gametophyte.
22) These two plants are morphologically identical, except for the reproductive structures.
23) Asexual Reproduction: It takes place by Biflagellated zoospores.
24) The sporophytic (2n) plant produces two types of sporangia: (1) Sexual unilocular sporangium and (2) Asexual plurilocular sporangium.
25) Both of these types of sporangia are borne on the same plant or different plants.
26) The unilocular sporangium produces 32-64 haploid zoospores by Meiosis, which on germinate to produce haploid plants (gametophytes).
27) The plurilocular sporangium produces diploid zoospores by Mitosis, which germinate to produce the diploid thalli.
28) The zoospores are pyriform, uninucleate with two laterally inserted or flagella.
29) The zoospore has a chromatophore and an eye spot.
30) The flagella are unequal, the anterior is longer and Pantonematic and the posterior is shorter and Acronematic.
31) The Zoospores are liberated & become rounded, secretes its own wall and germinate to produce a diploid sporophytic plants.
32) These zoospores of Plurilocular sporangia serve to reduplicate the sporophyte generation. Thus these Plurilocular sporangia are also called Neutral sporangia.

33) **Sexual Reproduction:** The gametophytic plant is morphologically identical with sporophytic plant.
34) Sexual reproduction takes place by the fusion of two gametes produced in Plurilocular gametangia in gametophytic plant.
35) Most of the species of *Ectocarpus* are **Dioecious** ie. the fusion occurs between gametes from different plants. A few species are **Monoecious.**
36) Sexual fusion may be **Isogamous, Anisogamous or Oogamous**. Most of the species are Oogamous.
37) **The anisogamy may be physiological or morphological**.
38) **Isogamy**: In *E. globifer*, the fusing gametes are identical in every aspect, they may be from different plants or even from the same plant.
39) **Physiological anisogamy**: In *E. siliculosus*,. The gametes are similar in size, shape and structure, but differ in motility.
40) The gametes from one strain are more active and behave as male gametes; whereas those of other strain are sluggish and passive. They behave as female gametes.
41) Several active male gametes cluster around a single female gamete with their long anterior flagellum. It is called **Clump formation**.
42) The female gamete secretes a Chaemotactic substance (Sirenine) to attract the male gametes.
43) **Morphological anisogamy**: In *E. secundus*, two kinds of gametangia are produced.
44) The megagametanigium with large locules produces larger and less active the gametes.
45) The microgametangium with smaller locules, produces smaller and more active gametes.
46) Thus, the fusing gametes are unequal in size but both are motile, their fusion is called Morphological anisogamy.
44) **Oogamy**: In *E. pedinae*, Plurilocular gametangia are of 3 types.
45) Out of the three Plurilocular structures, the largest is the Megagametangium, the medium sized is the Meiogametangium and the smallest is the Microgametangium.
46) The Mega and Microgametangia represent the Oogonia and Antheridia. They produce eggs and sperms which fuse to form zygote(2n).
47) The medium sized Meiogametangium produce gametes which develop parthenogenetically into new plants(n).
48) **Fertilization**: The fusion of gametes results in the formation of (2n) zygote. It develops into a diploid plant. **There is no zygotic meiosis**.
49) **Life cycle:** *Ectocarpus* exhibits **Isomorphic Diplo-haplontic life cycle**.
50) There are two plants which are morphologically identical but they show cytological differences.
51) **In *E.siliculosus* the sporophyte has 16 chromosomes & gametophyte has 8 chromosomes.**
52) In *Ectocarpus* the life cycle alternates between the diploid and haploid plants which are morphologically identical. Hence there is isomorphic alternation of generations in the life history of the *Ectocarpus.*

Classification of Ectocarpus

Kingdom – Plantae
Sub-kingdom – Cryptogamae
Division – Thallophyta
Sub-Division – Algae
Class – Phaeophyceae
Order – Ectocarpales
Family – Ectocarpaceae

Classification of *Polysiphonia*

Kingdom – Plantae
Sub-kingdom – Cryptogamae
Division – Thallophyta
Sub-Division – Algae
Class – Rhodophyceae
Sub-class – Floridae
Order – Ceramiales
Family - Rhodomelaceae

Polysiphonia

OCCURRENCE

1) Polysiphonia is a common red alga on sea-coasts. The plants usually grow in abundance in the intertidal belt and sub-littoral region attached to rocks.
2) The genus is represented in India by about 16 species which occur in the Southern and Western coasts. *P. platycarpa, P ferulacea, P. urceolata, P. variegata* are common Indian species.
3) *P. variegata* inhabits polluted water near estuaries, and is frequently found on the roots of mangrooves.
4) *P. urceolata* is epiphytic on *Laminaria*.
5) *P. fastigata* is a semi-parasite on the fronds of brown sea weed *Ascophyllum nodosum*.

THALLUS STRUCTURE

6) *Polysiphonia* has a filamentous thallus which is generally brownish red to purplish - red in colour. The filaments branch and rebranch several times giving the plant body a beautiful, delicate, feathery appearance.
7) The thallus is attached to the substratum in water by means of long, rhizoids.
8) The plant body is heterotrichous, having a basal prostrate system and an erect or projecting system of branched filaments.
9) The prostrate system creeps over the substratum. This system is well developed and multiaxial in many species &has unicellular rhizoids.
10) In some species *(P. granulosus)*, the rhizoids envelope the older branches forming a cortical layer around the cells. (Cortication).

11) The upright or vertical filaments arise from the creeping filaments. They may attain a height of 25 - 30 cm.
12) The main axis and other longer branches consists of a central siphon of elongated cells, which are surrounded by pericentral siphons made of relatively smaller peripheral cells.
13) The cells of the central and pericentral siphons are interconnected through pit connections.
14) The branching is usually lateral and branches are of two types, long and short.
15) The short branches are of limited growth and are known as Trichoblasts.
16) The trichoblasts are colorless, hair like, uniaxial and forked.
17) Trichoblasts usually bear male and female reproductive structures.

CELL STRUCTURE

18) The cells are uninucleate with many discoid chromatophores in the peripheral cytoplasm & chromatophores lack pyrenoids.
19) The cell wall is thick and is differentiated into outer pectic and an inner cellulose layer.
20) The nighbouring cells of central and pericentral siphons are inter connected through pit connections.
21) There is a central vacuole, surrounded by tonoplast.
22) The photosynthetic pigments are r - phycoerythrín, r - phycocyanin, besides chlorophyll-a, chlorophyll-d and carotenoids.
23) The reserve food materials are Floridean starch and Floridoside.

GROWTH

24) The thallus grows by means of a dome shaped apical cell.

REPRODUCTION

25) In the life cycle of *Polysiphonia,* three separate individual plants are found. They are:

1. Gametophyte: It is a free living haploid thallus and bears sex organs. Most species of *Polysiphonia* are dioecious i.e. male and female sex – organs are borne on different plants. The male gametophyte bears Spermatangia and the female plant bears Carpogonia.
2. Carposporophyte: It develops by mitotic divisions of zygote and hence diploid in nature. The carposporophyte remains attached to the female gametophyte and is dependent on it. It is concerned with the production of diploid asexual spores called Carpospores.
3. Tetrasporophyte : It develops from diploid carpospore and is an independent diploid plant like the gametophyte. It is concerned with asexual reproduction and produces non motile, haploid tetraspores. The haploid gametophyte and the diploid tetrasporophyte are morphologically similar.

26) Sexual reproduction: The sexual reproduction in *Polysiphonia* is Oogamous. The plants are dioecious or heterothallic.

Life cycle:

27) *Polysiphonia* exhibits two independent generations, the sporophyte & the gametophyte.
28) The gametophyte is represented by male and female plants.
29) The male plant bears spermatangia on fertile trichoblasts and the female plant bears carpogonium on carpogonial filament or procarp.
30) The fusion of male nucleus with the egg nucleus of carpogonium results in diploid Zygote of the carpogonium.
31) Ultimately this zygote nucleus undergoes post fertilization changes resulting in the formation or diploid Carposporophyte / Cystocarp.
32) The sheath enclosing the cystocarp is called Pericarp.
33) The opening of the cystocarp is called Ostiole.
34) The Carposporophyte is parasitic on the gametophyte deriving nutrition from the gametophyte.
35) The Carpospores formed in Carposporangia liberated from Carposporophyte germinate giving rise to diploid Tetrasporophyte.
36) The Tetrasporophyte produces Tetrasporangia.
37) Each tetrasporangium produces four haploid Tetraspores after meiosis.
38) The tetraspores on germination give rise to haploid gametophytes (Male & Female).
39) Thus in the life cycle there are three phases: two diploid phases (Carposporophyte and Tetrasporophyte) alternating with one haploid gametophyte phase. So the life cycle is called Triphasic diplobiontic.
40) As there is regular alternation of generations between morphologically identical diploid and haploid plants, the life cycle exhibits Isomorphic alternation of generations.

Multiple choice questions on Algae

1. *Spirogyra* belongs to the family ( )
   A) Chlorophyceae B) Algae C) Zygnemataceae D) Cryptogamae
2. Common name for *Spirogyra* is ( )
   A) Pond silk B) Water silk C) Pond scum D) All of these
3) The non chlorophyllous basal cell of *Spirogyra* filament is known as ( )
   A) Heterocyst B) Hold fast C) Rhizoid D) Vegetative cell
4) The shape of Chloroplast in *Spirogyra* is ( )
   A) Discoid B) Reticulate C) Stellate D) Ribbon
5. Find out the attached species of *Spirogyra* from the following. ( )
   A) *S. adnata* B) *S. rhizopus* C) *S. jogensis* D) All of these
6. In *Spirogyra*, Pyrenoids are found in / on ( )
   A) Cytoplasm B) Vacuole C) Chloroplast D) Nucleus
7. The common mode of vegetative reproduction in *Spirogyra* is ( )
   A) Budding B) Fragmentation C) Tubers D) Bulbils
8. The life cycle in *Spirogyra* is ( )
   A) Haplontic B) Diplontic C) Haplo-biontic D) Diplo-biontic
9. The thick walled zygote formed during unfavourable conditions is known as
   A) Akinete B) Aplanospore C) Zygospore D) Azygospore ( )
10. Azygospore of *Spirogyra* is ( )
    A) n B) 2n C) 3n D) 4n
11. During Isogamous scalariform conjugation, Zygospores are formed in ( )
    A) Male gametangium B) Female gametangium C) Conjugation tube D) None of these
12. Both Scalariform & Lateral conjugations take place simultaneously in ( )
    A) *S. adnata* B) *S. gratiana* C) *S. jogensis* D) *S. affinis*

13. A single Chloroplast in each cell is found in ( )

A) *S. adnata* B) *S. gratiana* C) *S. jogensis* D) *S.venkataramanii*

14. The most advanced type of conjugation in *Spirogyra* is ( )

A) Scalariform B) Indirect lateral C) Direct lateral D) All of these

15. Age of Algae or The period of Algae in Geological time scale is ( )

A) Ordovician B) Silurian C) Jurassic D) Precambrian

16. Algae are also known as ( )

A) Embryophytes B) Tracheophytes C) Spermatophytes D) Phycophytes

17. All Classess of Algae contain ( )

A) Chl-a & Chl-b B) Chl-a & Phycobilins C) Chl-a & Carotenoids D) Chl-a & Chl-d

18. Which class of algae are considered as "Sea weeds"? ( )

A) Green algae B) Brown algae C) Red algae D) Both B & C

19. Which class of algae are considered as "Kelps"? ( )

A) Chlorophyceae B) Phaeophyceae C) Cyanophyceae D) Rhodophyceae

20. Stomata are absent in ( )

A) Algae B) Liver worts C) Horn worts D) Mosses

21. Which algae are considered as "Fire algae"? ( )

A) Diatoms B) Desmids C) Dinoflagellates D) All of these

22. Asexual spores with flagella in Algae are known as ( )

A) Aplanospores B) Zoospores C) Zygospores D) Azygospores

23. Agar, Algin, Carrageenin, Funori of algae are Chemically ( )

A) Proteins B) Pigments C) Phyco-colloids D) Hydrophobic compounds

24. The pigment Allophycocyanin is found in ( )

A) Chlorophyceae B) Cyanophyceae C) Rhodophyceae D) Both B & C

25. In *Volvox*, 500-60000 cells living together to form hollow structure called

A) Polysiphonous B) Ceonocytic C) Coenobium D) Syncytium ( )

26. Which alga is known as "Rolling alga"? ( )

A) *Spirogyra* B) *Spirillum* C) *Nostoc* D) *Volvox*

27. The green algae which is known as "Stone wort & Aquatic Horse tail" is ( )

A) *Volvox* B) *Chara* C) *Spirogyra* D) *Oedogonium*

28. Land plants are evolved from ( )

A) Green algae B) Brown algae C) Red algae D) Blue green algae

29. The oxygenic photosynthesis occurs first in ( )

A) Green algae B) Brown algae C) Red algae D) Blue green algae

30. *Trichodesmium erythrium* (causes red colour to Red sea) belongs to ( )

A) Chlorophyceae B) Phaeophyceae C) Rhodophyceae D) Cyanophyceae

31. The Dinoflagellate which shows "Bio-luminescence" is ( )

A) Diatoms B) Desmids C) *Noctiluca* D) *Chara*

32. Silica (Sand) is found in the cell walls of ( )

A) Horn worts B) Diatoms C) Desmids D) Dinoflagellates

33. Red tides in Medeterranian sea are due to rapid multiplication of ( )

A) *Rhodomela* B) *Rhodemenia* C) *Gonyaulax* D) *Chondrus*

34. "Jewels of Plant kingdom" are ( )

A) Kelps B) Diatoms C) Sea weeds D) Cyanobacteria

35. The term "Species" was first used by ( )

A) Linnaeus B) A.P. de Candolle C) John Ray D) Haeckel

36. The largest algae in height is ( )

A) *Volvox* B) *Acetabularia* C) *Macrocystis* D) *Nereocystis*

37. The smallest Algae is ( )

A) *Volvox aureus* B) *Micromonas pusilla* C) *Chlorella pyrinoidosa* D) All of these

38. The biggest Unicellular alga is ( )

A) *Acetabularia* B) *Spirulina* C) *Chlamydomonas* D) *Chlorella*

39. The Algae which has highest number of Chromosomes (2n=592) is ( )

A) *Cladophora crispata* B) *Polysiphonia fastigata* C) *Spirogyra adnata* D) *Netrium digitalis*

40. The Algae which has lowest number of Chromosomes (2n=4) is ( )

A) *Porphyra linearis* B) *Chlorella pyrinoidosa* C) *Volvox aureus* D) All of these

41. The Oogonium of Thallophytes differ from Archegonium in ( )

A) lacking egg B) lacking jacket C) lacking stalk D) All of these

42. In Eukaryotes, Flagella are formed from ( )

A) Cell wall B) Cell membrane C) Blepharoplast D) Nucleus

43. *Spirulina* belongs to ( )

A) Chlorophyceae B) Phaeophyceae C) Rhodophyceae D) Cyanophyceae

44. Which class of Algae shows "Gaidukov phenomenon"? ( )

A) Chlorophyceae B) Rhodophyceae C) Cyanophyceae D) Both B & C

45. Chromatophores are found in ( )

A) Phaeophyceae B) Rhodophyceae C) Cyanophyceae D) All of these

46. Coenocytic / Multinucleate condition is found in ( )

A) *Vaucheria* B) *Oedogonium* C) *Ectocarpus* D) *Polysiphonia*

47. First cell of the sporophytic generation is ( )

A) Sporocyte B) Spore C) Zygote D) Gamete

48. First cell of the Gametophytic generation is ( )

A) Gametocytes B) Spore C) Zygote D) Gamete

49. Last cell of the sporophytic generation is ( )

A) Sporocyte B) Spore C) Zygote D) Gamete

50. Last cell of the Gametophytic generation is ( )

A) Gametocyte B) Spore C) Zygote D) Gamete

51. $CaCO_3$ is found in the cell walls of ( )

A) Diatoms B) *Oedogonium* C) *Nostoc* D) *Chara*

52. Isogamy, Anisogamy, Oogamy all of these are found in ( )
A) *Chlamydomonas* B) *Spirogyra* C) *Oedogonium* D) *Volvox*

53. Which of the following alga are used as SCP? ( )
A) *Nostoc* B) *Chlorella* C) *Spirulina* D) Both B& C

54. Cell wall is appeared like a "Soap box" in ( )
A) *Chlamydomonas* B) Diatoms C) *Oedogonium* D) *Volvox*

55. The alga which is Epizoic on Sloth bear is ( )
A) *Zoochlorella* B) *Cladophora* C) *Trichophilus* D) *Cephaleuros*

56. The green alga involved in Sewage disposal is ( )
A) *Chlorella* B) *Chlamydomonas* C) *Scenedesmus* D) All of these

57. Red snow may be caused by the Hypnospores of ( )
A) *Gonyaulax* B) *Trichodesmium* C) *Chlamydomonas* D) All of these

58. Which of the following act as "Pollution indicators"? ( )
A) Diatoms B) Blue green algae C) Red algae D) Green algae

59. Bromine is obtained from ( )
A) *Oedogonium* B) *Nostoc* C) *Rhodomela* D) *Vaucheria*

60. Which type of Meiosis occurs in during Haplontic life cycle? ( )
A) Zygotic B) Sporic C) Gametic D) All of these

Key

1-C 2-D 3-B 4-D 5-D 6-C 7-B 8-A 9-C 10-A 11-C 12-B 13-D 14- A 15-A 16-D 17-C 18-D 19-B 20-A
21-C 22-B 23-C 24-D 25-C 26-D 27-B 28-A 29-D 30-D 31-C 32-A 33-C 34-B 35-C 36-C 37-B 38-A
39-D 40-A 41-B 42-C 43-B 44-D 45-D 46-A 47-C 48-B 49-A 50-D 51-D 52-A 53-D 54-B 55-C 56-D
57-C 58-A 59-C 60-A

With best wishes

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