

BIOLOGY

NEET

CRASH COURSE

PLANT KINGDOM

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PLANT KINGDOM

1. Plant kingdom includes algae, bryophytes, pteridophytes, gymnosperms and angiosperms.
2. Algae are chlorophyll-bearing simple, thalloid, autotrophic and largely aquatic organisms.
3. Depending on the type of pigment possessed and the type of stored food, algae are classified into three classes, namely Chlorophyceae, Phaeophyceae and Rhodophyceae.
4. Algae usually reproduce vegetatively by fragmentation, asexually by formation of different types of spores and sexually by formation of gametes which may show isogamy, anisogamy or oogamy.
5. Bryophytes are plants which can live in soil but are dependent on water for sexual reproduction. Their plant body is more differentiated than that of algae. It is thallus-like and prostrate or erect and attached to the substratum by rhizoids. They possess root-like, leaflike and stem-like structures.
6. The bryophytes are divided into liverworts, hornworts and mosses.
7. The plant body of liverworts is thalloid and dorsiventral whereas mosses have upright, slender axis bearing spirally arranged leaves.
8. The main plant body of a bryophyte is gamete-producing and is called a gametophyte. It bears the male sex organs called antheridia and female sex organs called archegonia. The male and female gametes fuse to form zygote which produces a multicellular body called sporophyte. It produces haploid spores. The spores germinate to form gametophytes.
9. In pteridophytes the main plant is a sporophyte which is differentiated into true root, stem and leaves. These organs possess well-differentiated vascular tissues.
10. The sporophytes in pteridophytes bear sporangia which produce spores. The spores germinate to form gametophytes which require cool, damp places to grow.
11. The gametophytes in pteridophytes bear male and female sex organs called antheridia and archegonia, respectively.
12. Water is required for transfer of male gametes to archegonium in both bryophytes and pteridophytes where zygote is formed after fertilisation. The zygote produces a sporophyte by dividing mitotically.
13. The gymnosperms are the plants in which ovules are not enclosed by any ovary wall. After fertilization the seeds remain exposed and therefore these plants are called naked-seeded plants.
14. The gymnosperms produce microspores and megaspores which are produced in microsporangia and megasporangia borne on the sporophylls.
15. The sporophylls-microsporophylls and megasporophylls-are arranged spirally on axis to form male and female cones, respectively.
16. The pollen grain germinates and pollen tube releases the male gamete into the ovule, where it fuses with the egg cell in archegonia. Following fertilization, the zygote develops into embryo and the ovules into seeds.
17. In angiosperms, the male sex organs (stamen) and female sex organs (pistil) are born in a flower. Each stamen consists of a filament and an anther. The anther produces pollen grains (male gametophyte) after meiosis. The pistil consists of an ovary enclosing one to many ovules.
18. Within the ovule is the female gametophyte or embryo sac which contains the egg cell. The pollen tube enters the embryo-sac where two male gametes are discharged. One male gamete fuses with egg cell (syngamy) and other fuses with two haploid polar nuclei (triple fusion). This phenomenon of two fusions is called double fertilization and is unique to angiosperms.
19. The angiosperms are divided into two classes-the dicotyledons and the monocotyledons.
20. During the life cycle of any sexually reproducing plant, there is alternation of generations between gamete producing haploid gametophyte and spore producing diploid sporophyte. However, different plant groups as well as individuals may show different patterns of life cycle haplontic, diplontic or intermediate, i.e., haplodiplontic or diplohaplontic.

EXERCISE**Kingdom – Plantae - Algae**

- Q.1 Autotrophic thallophytes are called as :-
 (1) Fungi (2) Lichens (3) Algae (4) Microbes
- Q.2 Sea lettuce is the name given to :-
 (1) Laminaria (2) Fucus (3) Sargassum (4) Ulva
- Q.3 Which pigment is found in phaeophyceae :-
 (1) Chl. a, c and fucoxanthin (2) Chl. a, d and violaxanthin
 (3) γ Carotene and phycocyanin (4) None of these
- Q.4 Zygotic meiosis is characteristic of :-
 (1) Prokaryotes (2) Thallophyta (3) Bryophyta (4) Spermatophyta
- Q.5 Acetabularia, a largest unicellular plant, belongs to :-
 (1) Chlorophyta (2) Rhodophyta (3) Pyrrophyta (4) Phaeophyta
- Q.6 Phycobilins are characteristic pigments of :-
 (1) Rhodophyta and phaeophyta (2) Rhodophyta and Pyrrophyta
 (3) Pyrrophyta and Cyanophyta (4) Rhodophyta and Cyanophyta
- Q.7 Stone wort is common name of :-
 (1) *Chara* (2) *Chlorella* (3) *Laminaria* (4) *Polysiphonia*
- Q.8 Flagellated cells are absent in :-
 (1) Red algae (2) Blue green algae (3) Higher seed plants (4) All the above
- Q.9 Pyrenoids are characteristically found in algae. A pyrenoid consists of :-
 (1) Core of starch surrounded by protein (2) Core of protein surrounded by starch
 (3) Core of fatty acids covered by starch (4) Nucleic acid and protein
- Q.10 Sexual reproduction in Thallophyta takes place by :-
 (1) Isogamy (2) Anisogamy (3) Oogamy (4) Any of the above
- Q.11 Motile stages are not found in life cycle of :-
 (1) Red Algae & green Algae (2) Red Algae & brown Algae
 (3) Red Algae & blue green Algae (4) Green Algae & brown Algae
- Q.12 Oogonia of Thallophyta differs with archeogonia of bryophyta :-
 (1) Being multicellular (2) Being jacketed
 (3) Being stalked (4) Being unicellular and jacket less
- Q.13 "Carrageenin" is obtained from :-
 (1) *Chondrus crispus* (2) *Laminaria* (3) *Gelidium* (4) *Macrocystis*
- Q.14 Female sex organ of algae is called :-
 (1) Carpel (2) Oogonium (3) Archeogonia (4) Oosphere
- Q.15 Which of the following is not correctly matched :-
 (1) Heterocyst = N_2 -fixation structure of B.G.A.
 (2) Hormogonia = Reproductive structure of B.G.A.
 (3) Floridean starch = Stored food of brown algae
 (4) Cyanophycean starch = Stored food of B.G.A.
- Q.16 Spermatia are male gametes of :-
 (1) Red algae (2) Diatoms (3) Spermatophyta (4) Euglena

- Q.17 Chlorophyll 'c', 'd' are characteristic pigments of respectively :-
 (1) Red algae, brown algae and green algae (2) Brown algae, Red algae
 (3) Diatoms, Dinoflagellates, Euglena (4) High plants, Red algae, Diatoms
- Q.18 Reserve food of algae and fungi are :-
 (1) Starch and soluble floridoside (2) Oil droplets and fats
 (3) Starch and glycogen (4) Starch and Glycerol
- Q.19 Plants of thallophyta are :-
 (1) Haploid and gametophyte (2) Haploid and sporophyte
 (3) Diploid and gametophyte (4) Diploid and sporophyte
- Kingdom-Plantae – Bryophyta**
- Q.20 The Antherozoids of Bryophytes possess:-
 (1) 2 - Flagella (2) 1 - Flagella (3) Multiflagella (4) No-flagella
- Q.21 Which of the following is bryophyte :-
 (1) Funaria (2) Volvox (3) Chlorella (4) Spirulina
- Q.22 A leafy non vascular plant with parasitic sporophytic generation should properly be classified in
 (1) Thallophyta (2) Bryophyta (3) Pteridophyta (4) Spermatophyta
- Q.23 Jacketed archeogonia occur in :-
 (1) Riccia (2) Funaria (3) Sphagnum (4) All
- Q.24 Spores do not form protonema but directly grow into flat branching thallus in :-
 (1) Liverworts (2) Mosses (3) Ferns (4) Gymnosperms
- Q.25 In Bryophytes what is absent :-
 (1) Embryo formation (2) Fertilization
 (3) Motile gametes (4) True roots and vascular tissue
- Q.26 Which statement is true about bryophytes that:-
 (1) They are non photosynthetic
 (2) Zygote produces gametophyte on germination
 (3) Spores form gametophyte plant on germination
 (4) They have vascular tissues
- Q.27 Bryophytes are:-
 (1) Sciophytes (2) Heliophilous (3) Halophytes (4) Xerophytes
- Q.28 Leaves of Mosses and Ferns are :-
 (1) Analogous and homologous both (2) Analogous but not homologous
 (3) Homologous but not analogous (4) None of the above
- Q.29 Sex organ in bryophytes are :-
 (1) Unicellular and jacketed (2) Unicellular and non-jacketed
 (3) Multicellular and jacketed (4) Multicellular and non jacketed
- Q.30 Bryophyta show an advancement over algae in:-
 (1) Having multi cellular sporophytic generation (2) Having parasitic sporophyte
 (3) Having zygotic meiosis (4) None of the above
- Q.31 Which bryophyte known as Peat moss :-
 (1) Riccia (2) Riella (3) Sphagnum (4) Marchantia
- Q.32 Sphagnum may be used as a substitute of :-
 (1) Absorbent cotton (2) Non absorbent cotton
 (3) Plastic (4) Polythene

- Q.33 Riccia is a bryophyte due to :-
 (1) Thalloid (2) Rhizoids
 (3) Alternation of generations (4) Dependent sporophyte
- Q.34 Oblique septa in rhizoids are characteristic of :-
 (1) Liverworts (2) Hornworts (3) Mosses (4) Ferns
- Kingdom–Plantae – PTERIDOPHYTA**
- Q.35 Rhizoid containing sporophytic plants are characteristic of:-
 (1) Bryopsida (2) Spenopsida (3) Cycadophyta (4) Psilopsida
- Q.36 Roots first originated in :-
 (1) Algae (2) Fungi (3) Bryophyta (4) Pteridophyta
- Q.37 In pteridophyta, reduction division occurs when:-
 (1) Prothallus is formed (2) Spores are formed
 (3) Sex organs are formed (4) Gametes are formed
- Q.38 *Adiantum* is called "walking fern" due to :-
 (1) Power of locomotion (2) Vegetative reproduction
 (3) Motile antherozoites (4) All the above
- Q.39 Plants having vascular tissues but lacking seeds are :-
 (1) Bryophyta (2) Pteridophyta (3) Gymnosperms (4) Angiosperms
- Q.40 The antherozoids of fern are :-
 (1) Uniflagellate (2) Biflagellate (3) Quadriflagellate (4) Multiflagellate
- Q.41 The botanical name of "*Sanjeevani*" is :-
 (1) *Selaginella utricularia* (2) *Selaginella bryopteris*
 (3) *Selaginella crotalaria* (4) *Selaginella botardia*
- Q.42 Most distinct type of alternation of generations is demonstrated by :-
 (1) Angiosperms (2) Ferns (3) Gymnosperms (4) Bryophytes
- Q.43 In ferns, the permanent roots are :-
 (1) Tap root (2) Adventitious roots (3) Tuberos roots (4) Rhizome
- Q.44 Gametophytes of pteridophytes are :-
 (1) Short lived, Free living and sexual organ bearing
 (2) Heart shaped, dependent on sporophyte and sex organ bearing
 (3) Fibre like, dependent on sporophyte and sex organ bearing
 (4) Semi parasite on sporophyte
- Q.45 Spore producing part of pteridophytes is:-
 (1) Sporangia of gametophytes (2) Capsule of sporophytes
 (3) Sporangia of sporophytes (4) Capsule of gametophytes
- Q.46 Cambium is absent in :-
 (1) Pteridophytes (2) Gymnosperms
 (3) Angiosperms (4) Pteridophytes and gymnosperms
- Kingdom–Plantae – Gymnosperm**
- Q.47 Zooidogamy takes place in:-
 (1) Lower Gymnosperms (2) Higher Gymnosperms
 (3) Angiosperms (4) All the above
- Q.48 All Gymnosperms are:-
 (1) Heterosporous (2) Arborescent (3) Seed plants (4) All the above

- Q.49 Ovule is morphologically equivalent to:-
 (1) Megaspore (2) Megasporangium (3) Microspore (4) Megasporophyll
- Q.50 Double fertilization and triple fusion are characteristic of:-
 (1) Spermatophyta (2) Gymnosperms (3) Pteridophyta (4) Angiosperms
- Q.51 Ovules are naked in gymnosperm because:-
 (1) Fertilisation is absent (2) True carpels are absent
 (3) Archegonia are absent (4) Endosperm is absent
- Q.52 Ephedrine is obtained by :-
 (1) *Ephedra* (2) *Gnetum* (3) *Pinus* (4) *Cycas*
- Q.53 Living fossil:-
 (1) *Cycas* (2) *Ginkgo* (3) *Psilotum* (4) All the above
- Q.54 *Sequoia* belongs to:-
 (1) Cycadofilicales (2) Gnetales (3) Coniferales (4) Dicots
- Q.55 Male gamete of *Cycas* is largest in plant kingdom, is :-
 (1) Non motile (2) Biflagellate (3) Multiciliate (4) Uniflagellate
- Q.56 In *Cycas* the microsporangia are born on which side of microsporophyll :-
 (1) Adaxial (2) Abaxial (3) Lateral (4) Terminal
- Q.57 Gymnosperms differ from pteridophytes in having-
 (1) Presence of tracheids (2) Presence of embryo
 (3) Presence of ovule (4) Companion cell
- Q.58 The "endosperm" of a gymnosperm represent :-
 (1) Gametophytic tissue (2) Sporophytic tissue
 (3) Tissue formed by double fertilization (4) Polyploid tissue
- Q.59 Vessels occur in the following gymnosperm plant :-
 (1) *Ginkgo* (2) *Taxus* (3) *Gnetum* (4) All the above
- Q.60 Which of the following is not heterosporous :-
 (1) *Selaginella* (2) *Pinus* (3) *Pteridium* (4) *Cycas*
- Q.61 Multiciliate male gametes are found in :-
 (1) *Pinus* (2) *Cycas* (3) *Gnetum* (4) Mango
- Q.62 Which group of plants is exclusively arborescent (woody) :-
 (1) Pteridophyta (2) Dicots (3) Gymnosperms (4) Monocots

Kingdom-Plantae – Angiosperms

- Q.63 Origin of angiosperms took place during
 (1) Mesozoic era (2) Coenozoic era (3) Archaeozoic era (4) Palaeozoic era
- Q.64 Characteristic of Angiosperms which distinguish them from gymnosperms
 (1) Presence of fruits and flowers
 (2) Double fertilization and triploid endosperm formed after double fertilization
 (3) Companion cells in phloem and vessels in xylem
 (4) All of the above
- Q.65 Endosperm of angiosperm is a structure
 (1) Haploid (2) Diploid (3) Tetraploid (4) Triploid
- Q.66 Angiosperm that spreads over largest area is
 (1) *Ficus bengalensis* (2) *Ficus religiosa* (3) *Ficus elastica* (4) *Sequoia gigantea*

- Q.67 A saprophytic angiosperm that absorbs humus through fungi (mycotrophic humus plant)
 (1) Neottia (2) Monotropa (3) Corallorhiza (4) All of these
- Q.68 Man made angiosperm is
 (1) Barley (2) Maize (corn) (3) Triticale (4) Potato
- Q.69 Smallest angiosperm with smallest flower is
 (1) Wolffia is smallest angiosperm and lemna has smallest flower
 (2) Lemna is smallest angiosperm but Wolffia has smallest flowers
 (3) Lemna is smallest angiosperm and Zostera has smallest flower
 (4) None of the above statements is correct.
- Q.70 A structure absent in Angiosperms is
 (1) Archegonium (2) Pistil (3) Microgametophyte (4) Megagametophyte
- Q.71 Monocots are characterised by
 (1) Fibrous root system, parallel venation, trimerous flower, two lateral cotyledons and eustele (parallel vascular bundles)
 (2) Fibrous root system, parallel venation, trimerous flower, one cotyledon and atactostele (scattered vascular bundles)
 (3) Fibrous root system, parallel venation, pentamerous flower one cotyledon in embryo and atactostele
 (4) Taproot system, parallel venation, trimerous flowers, one cotyledon and eustele.
- Q.72 Biggest flower belongs to a Angiospermic plant which is
 (1) Partial stem parasite (2) Partial root parasite
 (3) Total stem parasite (4) Total root parasite
- Q.73 Insectivorous plants are adapted to
 (1) Soil deficient in sugars (2) Soil deficient in nitrogen compounds
 (3) Soil deficient in trace elements (4) Soil is marshy
- Q.74 Santalum album (sandal wood tree) is
 (1) Partial stem parasite (2) Partial root parasite
 (3) Total stem parasite (4) Total root parasite
- Q.75 Choose the correct pair.
 (1) Cuscuta – Parasite (2) Dischidia – insectivorous
 (3) Opuntia – Predator (4) Capsella – hydrophyte
- Q.76 Roots in some genera of gymnosperm have fungal association in the form of mycorrhiza ____ (i) ____ while in some others ____ (ii) ____ small specialised roots called coralloid roots are associated with N_2 fixing cyanobacteria. The stem are unbranched ____ (iii) ____ or branched ____ (iv) ____ in this question (i), (ii), (iii) & (iv) are respectively.
 (1) (i) pinus, (ii) cycas, (iii) cycas (iv) pinus
 (2) (i) cycas (ii) pinus (iii) pinus (iv) cycas
 (3) (i) pinus (ii) cycas (iii) pinus (iv) cycas
 (4) (i) cycas (ii) pinus (iii) cycas (iv) pinus
- Q.77 Which is/are wrong regarding gymnosperms
 (A) Heterosporous
 (B) Produce haploid microspore & megaspore
 (C) Two kind of spore are produced within sporangia that are borne on sporophyll
 (D) The microspores develop into a male gametophytic generation, which is highly reduced.
 (1) only A & D (2) only B & D (3) only B & C (4) none

- Q.78 Which statement is/are correct with respect to Angiosperm.
 (A) The seeds are enclosed by fruits.
 (B) The angiosperms are an exceptionally large group of plants. occurring in wide range of habitats.
 (C) They range in size from tiny, almost microscopic to tall trees of eucalyptus (over 100 meters).
 (D) They provide us food, fodder, fuel medicine etc.
 (1) only A & C (2) only A, D (3) only A, C & D (4) A, B, C & D all
- Q.79 In angiosperms correct statement is/are :
 (A) Within ovule highly reduced female gametophytes is present termed as embryosac.
 (B) The embryo sac formation is preceded by meiosis.
 (C) Each cells of the an embryosac is haploid.
 (1) only A (2) only B, (3) A, B & C (4) none
- Q.80 In angiosperm the pollen tubes enter the embryosac where two male gamete are discharged. one of the male gamete fuses with the _____ (i) _____ to form a zygote known as _____ (ii) _____. The other male gamete fuses with the diploid secondary. nucleus to produce the _____ (iii) _____ in this question (i), (ii) & (iii) are respectively.
 (1) (i) Syngergid, (ii) Syngamy, (iii) Triploid PEN
 (2) (ii) Eggcell, (ii) Syngamy, (iii) Diploid PEN
 (3) (i) Egg cell, (ii) Syngamy, (iii) Triploid PEN
 (4) (i) Antipodal cells, (ii) Double fertilization (iii) Triploid PEN

AIIMS Special

Instructions for following questions (Q.81 to Q.91).

- (1) If both Assertion & Reason are true and the reason is the correct explanation of the assertion, then mark (1).
 (2) If both Assertion & Reason are true but the reason is not the correct explanation of the assertion, then mark (2).
 (3) If Assertion is true statement but Reason is false, then mark (3).
 (4) If both Assertion and Reason are false statements, then mark (4).
- Q.81 **Assertion :** Thallophytes are non-vascular, non-archegoniate and non-cormophytic plants.
Reason : Thallophytes lack vascular bundles, archegonia and differentiated plant body.
- Q.82 **Assertion :** Funaria archegonium has maximum concentration of sucrose at the tip of neck.
Reason : Male gametes show chemotropic movement
- Q.83 **Assertion :** Pyrenoids may or may not be surrouflided by a sheath of starch plates in algae.
Reason : In higher plants, these are replaced by amyloplasts.
- Q.84 **Assertion :** Seeds are formed by some species of spike moss.
Reason : All conditions for seed habit are fulfilled by these species of spike moss.
- Q.85 **Assertion :** Resin duct in coniferales is schizogenous in origin.
Reason : Resin duct helps to retain water as well as seals the injured areas of plants.
- Q.86 **Assertion :** Gymnodinium is red tide causing alga.
Reason : Phycoerythrin is responsible for red colour.
- Q.87 **Assertion :** Sporophyte in Funaria is semiparasite on gametophyte.
Reason : Spore forms secondary protonema in Funaria.
- Q.88 **Assertion :** Red algae contribute in producing coral reefs.
Reason : Some red algae secrete and deposite calcium carbonate over their walls.
- Q.89 **Assertion :** True indusium is present as protective covering of sori in Dryopteris.
Reason : It develops from the margin of leaf.
- Q.90 **Assertion :** In Pinus ovule nucellus is protected by three layered covering.
Reason : Three integuments are present in ovule.
- Q.91 **Assertion :** Trabeculated endoderm is present in Selaginella stem.
Reason : Here endoderm is present in form of bands.

- Q.32 Which of the following are homosporous pteridophytes? [AIIMS 2016]
 I. Selaginella II. Lycopodium III. Salvinia IV. Equisetum
 (1) I and IV only (2) II and III only (3) II and IV only (4) III and IV only

- Q.33 Consider the following statements regarding the major pigments and stored food in the different groups of algae and choose the correct option [AIIMS 2017]
 (i) In chlorophyceae, the stored food material is starch and the major pigments are chlorophyll a and d.
 (ii) In phaeophyceae, laminarian is the stored food and major pigments are chlorophyll-a and b.
 (iii) In rhodophyceae, floridean starch is the stored food and the major pigments are chlorophyll-a, d and phycoerythrin.
 (1) (i) is correct, but (ii) and (iii) are incorrect (2) (i) and (ii) are correct, but (iii) is incorrect
 (3) (i) and (iii) are correct, but (ii) is incorrect (4) (iii) is correct, but (i) and (ii) are incorrect

ANSWER KEY

Q.1	3	Q.2	4	Q.3	1	Q.4	2	Q.5	1	Q.6	4	Q.7	1
Q.8	4	Q.9	2	Q.10	4	Q.11	3	Q.12	4	Q.13	1	Q.14	2
Q.15	3	Q.16	1	Q.17	2	Q.18	3	Q.19	1	Q.20	1	Q.21	1
Q.22	2	Q.23	4	Q.24	1	Q.25	4	Q.26	3	Q.27	1	Q.28	2
Q.29	3	Q.30	1	Q.31	3	Q.32	1	Q.33	4	Q.34	3	Q.35	4
Q.36	4	Q.37	2	Q.38	2	Q.39	2	Q.40	4	Q.41	2	Q.42	2
Q.43	2	Q.44	1	Q.45	3	Q.46	1	Q.47	1	Q.48	4	Q.49	2
Q.50	4	Q.51	2	Q.52	1	Q.53	4	Q.54	3	Q.55	3	Q.56	2
Q.57	3	Q.58	1	Q.59	3	Q.60	3	Q.61	2	Q.62	3	Q.63	1
Q.64	4	Q.65	4	Q.66	1	Q.67	4	Q.68	3	Q.69	1	Q.70	1
Q.71	2	Q.72	4	Q.73	2	Q.74	2	Q.75	1	Q.76	1	Q.77	4
Q.78	4	Q.79	3	Q.80	3	Q.81	1	Q.82	3	Q.83	2	Q.84	4
Q.85	2	Q.86	1	Q.87	1	Q.88	1	Q.89	3	Q.90	3	Q.91	1