CBSE Class 11 Biology

Important Questions

Chapter 3

Plant Kingdom

1 Marks Questions

1. Define gemma.

Ans. Gemma are green, multicellular, asexual buds which develop in receptacles called as gemma cups.

2. Which group of plants is regarded a first lerrestrial plank ? Why?

Ans. Pteridophytes. As they possess vascular tissues – xylem and phloem.

3. The gametes and spores of phaeophyceae have a distinct morphology. Give its name.

Ans. Pyriform (pear-shaped). Bear two laterally attached flagella.

4. Which substance has ,structural similarity to floridean starch ?

Ans. Amylo pectin and glycogen.

5. Name the organisms which exhibit heterospory and seed habit.

Ans. Selaginelia and Salvinia.

6.Name seedless vascular plants.

Ans. Pteridophytes.

7.Which pigment is responsible for red colour of red algae?

Ans. Phycobilin, phycoerythrin & phycocyanin.

8.What is a cone?

Ans. The fruiting body of gymnosperms which consists of micro & megasporophyll are called as cone.

9.Name a unicellular algae.

Ans. Chlamydomonas

10.Why some bryophytes are called liverworts.

Ans. Some bryophytes are called liverworts as they are liver shaped eg. marchantia.

11.What are rhizoids?

Ans. Rhizoids are slender, unicellular or multicellular hair like structure, which penetrate in the moist soil & absorb the water for plants.

12.Name the algae which is used for fodder to poultry birds.

Ans. Laminaria.

13.Which groups of plants is called vascular cryptogam ?

Ans. Pteridophyta.

14.What is a cone ?

Ans. The fruiting body of gymnosperm which consists of micro & megasporophyll are called as clone.

15.What are cone bearing plants called?

Ans. Conifers

16.Name any red algae which is used as vegetables?

Ans. Porphyra

17.What do you mean by thallus?

Ans. It is a plant body which is not differentiated into root, stem & leaves.

18.Name the vascular plants which produces only spores but no flowers or seeds?

Ans. Pteridophytes.

19.Where are the antheridia & archaegonia located in ferns?

Ans. Prothallus

20.What are the two main classes of bryophytes?

Ans. Liverwort & Mosses.

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2 Marks Questions

1. Sphagnum has lot of economic importance. Justify.

Ans. Provide peat used as fuel: used as packing material for trans- shipment of living material.

2. Gymnosperms can show polyembryony. Why do you think so.

Ans. Have two or more archegonia, so polymebryony call occur.

3. How is leafy stage formed i mosses? flow is it different fro protonema?

Ans. Leafy stage develops from secondary protonema as a lateral bud. Protonema is creeping, green, branched frequently fiIamentous stage whereas leafy stage is upright with spirally arranged leaves,

4. What features led to dominance of vascular plants?

Ans. Three important features have to dominance of Angiosperm:-

(i) Development of deep roots capable of penetrating the soil.

(ii) Development of water- proofing material eg. cutin on aerial surfaces, to reduce water loss through evaporation.

(iii) Development of strong woody material anchor & support above ground structures.

5.Differentiate between Red algae & brown algae?

Ans.

RED ALGAE	BROWN ALGAE
i) mostly unicellular & microscopic	i) filamentous & heterotrichous.
ii) Phycoerythrin, phycocyanin & phycobilin pigments are present.	ii) fucoxanthin pigment is present.
Ii iii) Reserve food material is Floridian starch	iii) Reserve food material is Laminarian starch.
iv) chlorophyll 'a' present	iv) chlorophyll 'a' absent
v) eg. Gelidium, polysiphonia	v) Laminaria, focus & sargassum

6. Give some important features of dicots?

Ans. The dicotyledons are characterized by either woody or herbaceous habit, their flower parts usually are in four or five their leaves are net-veined, vascular bundles are arranged in a circle or ring within the stem. The dicots have two cotyledons in their seeds.

7.List four classes of plants belonging to fern group.

Ans. Pteridophytes or fern group are divided into four classes:-

(i) Class 1: psilopsida eg. psilotum nudum.

(ii) Class 2: Lycopsida eg. Lycopodium phlegmaria.

(iii) Class 3: Sphenopsida eg. Equisetum

(iv) Class 4: pteropsida eg. Adiantum & pteridium

8.How will you differentiate between red algae & green algae.

Ans.

RED ALGAE	GREEN ALGAE
i) It belongs to rhodophyta	i) It belongs to chlorophyta

ii) Phycoerythrin, phycocyanin, phycobilin & chlorophyll 'a' is present.	ii) Chlorophyll 'a' & 'b' with β-carotene & carotinoids are present.
iii) Reserve food material is Floridian starch	iii) Reserve food material is starch.
iv) Unicellular & microscopic but few are filamentous & heterotrichous	iv) Unicellular or multicellular may be motile & flagellated
v) eg. geladuim, porphyra.	v) eg. spirogyra, Volvox

9.Write two important characteristics of gymnosperms?

Ans. (i) It is a group of vascular plant which possess naked seeds attached to surface of megasporophyll

(ii) Megasporophyll is not folded to form on ovary so there is no fruit formation

10.How do fungi differs from algae ?

Ans.

Algae	**Fungi**
i) Chlorophyll present so they are green	i) chlorophyll absent so they are non- green.
ii) Autotrophic nutrition	ii) Saprophytic or parasitic nutrition
iii) Absorbs inorganic & mineral salts	iii) Absorbs organic or mineral salts
iv) Eg chlamydomonas, ulothrix	iv) Eg. albugo & yeast

11.Both gymnosperms & angiosperm bear seeds but then why are they classified separately?

Ans. The gymnosperms are plants that bears ovules which are not covered by any ovary wall & remain exposed. The seeds of gymnosperms are not covered that is they are naked but in the Angiosperm, the seeds remains closed inside the fruit so these are classified seperalely.

12.List any three characterstic features of Bryophytes.

Ans.(i) They are small, erect plant growing in moist shady places

(ii) They have no leaf like, stem like or root like structure.

(iii) Most plants are gametophytes. They develop from haploid spores.

13.List any two differences' between gymnosperms & angiosperms?

Ans.

Gymnosperm	**Angiosperm**
i) Seed plants without flowers & with naked seeds.	i) Angiosperms are known as flowering plants which have covered seeds
ii) There are about 9000 species of gymnosperm	ii) There are about 250,000 sp. Of angiosperm.
iii) Eg. cycas, Pinus	iii) Eg. delonix, Rosa.

14.What is the role of capsule in life history of moss?

Ans. Capsule is an important structure of sporophyte of moss plant. In the capsule, spores are produced. When the capsule ripens its dehiscence takes place & spores are liberated by winds. The spores develop favorable conditions into protonema.

15.What is the difference between syngamy & triple fusion?

Ans. Syngamy is fusion of male gamete (sperm) to the female gamete (egg) to form a zygote while triple fusion is fusion of another male gamete to the diploid secondary nucleus to form primary endosperm nucleus.

16.Mention some of the uses of ferns?

Ans. (i) Ferns are much used by florists for decoration.

(ii) They are also grown as ornamental plants.

(iii) Wood from tropical tree fern are used as building material because it resists termite decay.

(iv) Ferns are used as astringent during childbirth to stop bleeding.

(v) Maiden hair fern is a source of expectorant.

17.Tabulate differences between Gymnosperm & pteridophytes.

Ans.

Gymnosperm	**Pteridophytes**
(i) found in temperate climatic region	(i) found is shady & moist places
(ii) cambium present	(ii) cambium lacking
(iii) pollentube is formed	(iii) pollen tube is not formed
(iv) Neck canal cells are absent	(iv) Neck canal cells are present

18.What is heterospory? What is its significance?

Ans. Heterospory refers to the production of two kinds of spores in pteridophytes eg. salivinia and selaginella produces two kinds of spores macrospores & microspores. These mega & microspores germinate & then give rise to male & female gametophytes. The female gametophyte is retained on parent sporophyte for variable period of time. So, this event is a precursor to seed habit.

19.What are gymnosperms? What are its four classes?

Ans. Gymnosperms are vascular plants with naked seeds. The seeds are exposed on surface of sporophyll. The reproductive organs are usually borne in cones on which spores are spirally arranged. Gymnosperms are classified into four groups Conifers, Cycads, Ginkgo, Gnetophytes.

20.How would you distinguish between monocots & dicots?

Ans.

	Monocots	**Dicots**
Root	Aaventitious	Tap roots
Stem	Soft & herbaceous	Woody & herbaceous
Leaf	Parallel	Reticulate Venation
Floral parts	Trimerous	Tetra – or pentamerous
Cotyledons.	One cotyledon	Two cotyledon
seeds	Endospermic seeds	Non – endospermic seeds.

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3 Marks Questions

1. The leaves in gymnosperms are adapted to withstand xerophytes conditions. Justify.

Ans. Gymnosperms like conifers have needle shaped Ieaves to reduce surface area, thick cuticle and sunken stomata to reduce water loss.

2. The gametophytes of bryophytes and pteridophytes are different from that of gymnosperms. How?

Ans. Male and female gametophyte have free existence in bryophytes and pteri- dophytes but not in Gymnosperms.

3. Roots m some gymnosperms have fungal or algal association. Give examples, their names and role in the p1ants.

Ans. Pinus has fungal association to form mycorrhiza which helps ii absorption of water and minerals.

Cycos has cy in its roots which forms coralloid roots and helps in nitrogen fixation.

4.Explain in brief the structure of prothallus of fern?

Ans. Prothallus of Fern:-

(i) It is a heart-shaped structure.

(ii) The sex organs are present on the lower surface of the prothallus below the apical notch.

(iii) Sex organs are antheridia & archaegonia.

(iv) Prothallus is produced from the meiospore as gametophyte of fern.

(v) Below the sex organs are rhizoids

(vi) Archegonia are flask shaped but antheridia are globose.

(vii) Male & female gametes are produced in antheridia & archegonia.

5.Point out differences in sexual reproduction of moss & fern?

Ans.

MOSS (Bryophyte)	**Fern (pteridophytes)**
i) Sex organs are borne on the gametophytic plant body.	i) Sex organs are borne on an inconspicuous gametophyte or prothallus which represents an alternate phase to sporophytic plant body.
ii). Antheridia are well developed & often possess a stalk.	ii). Antheridia are less developed & mostly devoid of a stalk.
iii). Antheridial jacket made up of several cells	iii). Antheridial jacket mostly made up of only 3 – cells.
iv). Sperms biflagellate	iv). Multiflagellate sperms
v). Archegonia often have stalk	v). Archegonia do not have stalk
vi). Neck is 6 - rowed	vi). Neck is 4 – rowed.

6.Describe the main features of pteridophytes?

Ans. (i) They are small sized & occur in humid & tropic climate mostly growing as epiphytes.

(ii) The plant body is divided into root, stem & leaves.

(iii) Some ferns appears like small trees.

(iv) Lycopoduim, selaginella & equistem are some members of pteridophytes.

(v) The leaves are of two types compound leaves & sporophylls.

(vi) Plant body is sporophytic.

(vii) They are vascular cryptograms.

(viii) Alternation of generation is present.

(ix) Prothallus represent gametophytic phase.

(x) Pteridophyta is divided into 4- classes :- psilopsida, lycopsida, sphenopsida & pteropsida

7.“Algae & Bryophytes are different from each other.” Point out the main differences between them?

Ans.

ELGAE	**BRYOPHYTES**
i) Mostly aquatic	i) mostly terrestrial, found in damp, shady places.
ii) Thallus single celled to branched filaments	ii) Thallus made of parenchymatous cells.
iii) No tissue differentiation	iii) Tissue differentiation well marked
iv) Stomata absent	iv) Stomata present
v) Rhizoids absent	v) Rhizoids present
vi) Asexual reproduction by aplanospores or zoospores.	vi) Asexual reproduction absent
vii) Sexual reproduction isogamous anisogamoes or oogamous.	vii) Sexual reproduction is of oogamous type
viii) No embryo formed after fertilisation	viii) Embryo formed after fertilization
ix) Eg. ulothrix, volvox, ulva, chladophora	ix) Eg. Ruccia, marchantia, funaria, porella

8.What are the identifying features of Angiosperms flowering plants.

Ans. (i) Majority of the plants around us are Angiosperms.

(ii)flowering plants show great number of diversities in habitat, habits, forms, duration of life, mode of nutrition etc.

(iii) The plants with stem varying from a few mm to metre or so in height are termed as herbs, medium sized plants with woody stem are termed as shrubs & tall woody plants are known as trees.

(iv) Plants which live for a year or part of year are termed annual, which live for two year are termed as biennials & which live more than two years are termed as perennials.

(v) Plants which live in extremely dry conditions are termed as Xerophytes; plants living in water are termed as hydrophytes; those living in moderate conditions are termed as mesophytes.

(vi) All flowering plants have roots, stem & leaves. They produce flowers, seeds & fruits..

(vii) The economic uses of plants are varied. Plants provide us with materials for our food, clothing & shelter.

9.Describe the similarities in sexual reproduction of moss & fern.

Ans. (i) Oogamous mode of sexual reproduction which involves fertilization of non- motile female gametes ar egg by means of a motile male gamete or sperm.

(ii) In both the male sex organ consists of a jacket of sterile cells that enclose a spermatogenous tissue.

(iii) Sperms are flagellate.

(iv) Female sex organ or archaegonia are flask shaped with tubular neck & a swollen basal venter. Venter encloses a single egg or oosphere & sterile venter canal cell. Neck has one or more neck canal cell.

(v) Are external source of water is needed for the swimming of the sperms so as to reach the open archegonia.

(vi) Dependence of the embryo upon gametophytic phase.

(vii) Occurrence of hetromorphic or heterologous alternation of generation.

10.Why are Bryophytes regarded as “the amphibians of plant kingdom”?

Ans. Amphibians live on land & water with equal case but they must come to water during the breeding season to lay their egg. Water is therefore, essential for amphibians for breeding.

In the same way, bryophytes live on land but they must get water for completing their life history because only through the medium of water antherozoides reaches the archegonia & fertilise the egg. If therefore, water is not available to bryophytes during the period they shall not survive so on account of this similarity the bryophytes are called as “Amphibians of plant kingdom”

11.Describe the important characterslics of gymnosperms?

Ans.(i) They grow in cool & warm climate in hills & in plains.

(ii) Gymnosperms are evergreen woody & perennial plants

(iii) They have well developed vascular system but compared to seed plants their xylem has no vessel & phloem is without companion cell.

(iv) Plants are heterosporous.

(v) Conifers are cone bearing trees eg. pines, cedrus fir.

(vi) They usually have evergreen needle like leaves which are well adapted to withstand extremes of temperature, humidity & wind.

(vii) Reduction of gametophytic generation.

(viii) The leaves have a reduced surface area thick cuticle & sunken stomata to conserve moisture & reduce the water loss by transpiration.

(ix) Ovules are exposed to receive pollen grains.

(x) Gymnosperms possess exposed or naked seeds.

(xi) Polyembryony is common occurrence.

12.List common modes of reproduction in Algae?

Ans. Reproduction in algae occurs by the following method:-

(i) Vegetative reproduction:- It occurs by fragmentation, zoospores, aplanospares palmella stages etc. akinites are also formed in asexual reproduction.

(ii) Sexual Reproduotion in chlamydomonas:- In chlamydomonas, the flagellated & motile gametes which are isogamous unite to form a quadriflagellate zygote. It is converted into zygospore. When the flagella are lost & a cyst wall is formed around it zygospore germinate by meiosis to form four haploid meiospores.

(iii) Palmella stage:- If the conditions are unfavourable, the daughter cells instead of forming zoospore divided repeatedly into numerous cells. Their walls become gelatinous & cells remains together. This stage is called palmella stage. On return of favourable conditions, the cells inside the gelatinous mass & develop cilia.

(iv) Asexual Reproduction in chlamydomonas:- It takes place by formation of zoospores In the formation of zoospores, the cilia from chlamydomonas are withdrawn. The cell content divide into 4 & 8 daughter cells. In this way, they become motile & called as zoospores.

13.What are ferns? Describe its salient features.

Ans. Ferns are found in warm moist tropical region & dry rocky places. The plant body is distinguished into three parts- i) underground stem rhizome ii) it bear roots & iii) it sends caerial shoots with leaves. Leaves of ferns are of two types- a) simple leaves with single vein & b) compound leaves with several leaflets. The sporophyte phase is dominant in ferns. On underside of leaflets are borne sori which contains sporangia. Where the spores are produced after meiosis division, the sporangium has an annulus. It is made of band of thickened cells that dry out pulling it open. So spores are released. These spores germinate into a porthallus the gametophyte. The gametophyte bears antheridia & archaegmia on underside. The antheridia bear flagellated sperms & egg lies at the base of archaegonia. The process of fertilization occurs when water is available for flagellated sperms to swim to reach the egg.

14.Differentiate between Red, Brown & Green algae.

Ans.

RED ALGAE	**BROWN ALGAE**	**GREEN ALGAE**
i) Mainly marine	i) Marine form	i) Freshwater mostly
ii) Only few are unicellular	ii) Unicellular forms almost exist	ii) Unicellular species are more
iii) Thylakoid unstacked	iii) Occurs in group of three	iii) stacked in groups of 2-20
iv) Only chlorophyll a present	iv) chlorophyll a & c present	iv) Chlorophyll a & b present
v) fucoxanthin present	v) Fucoxanthin present	v) Fucoxanthin absent
vi) Phycobilin present	vi) Phycobilin absent	vi) Phycobilin absent
vii) Reserve food is starch	vii) Reserve food is laminarin	vii) Reserve food is starch
viii) Motile stages are not observed	viii) Present	viii) Present.

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5 Marks Questions

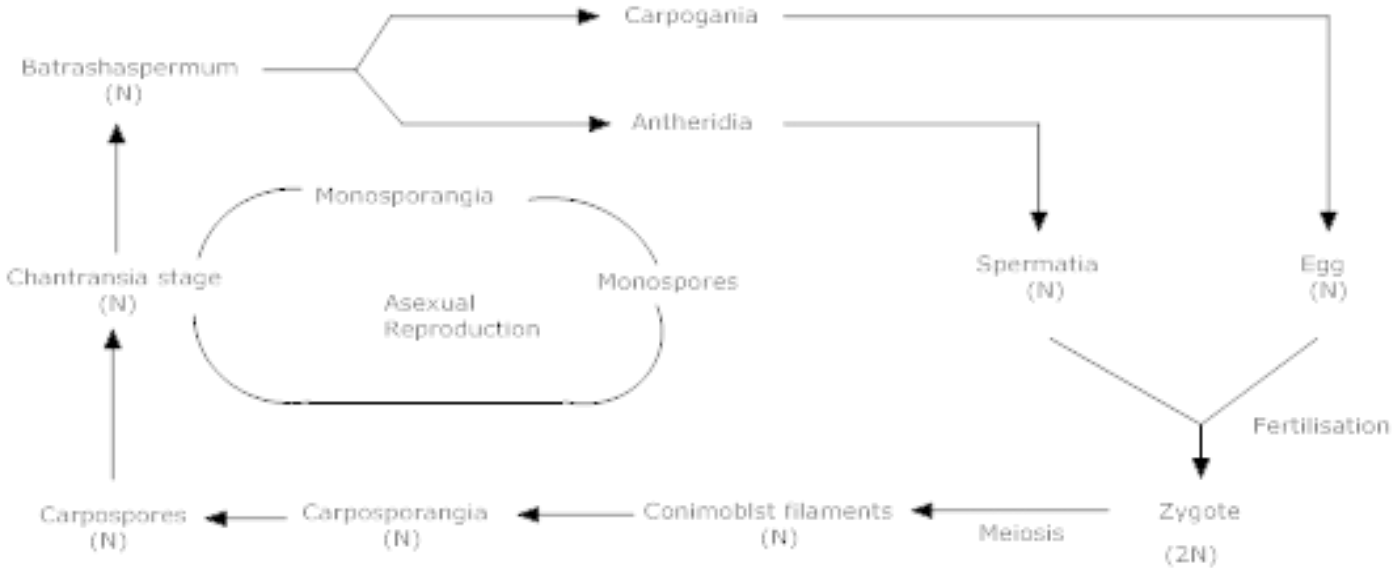
1.Explain the life cycle in green algae?

Ans. There are three types of life cycle are found in green algae:-

(a)HAPLONTIC LIFE CYCLE:- The dominant phase is haploid. Diploid state is found only in the form of zygote or zygospores. Meiosis takes place at time of its germination. Eg. ulothrix, spirogyra.

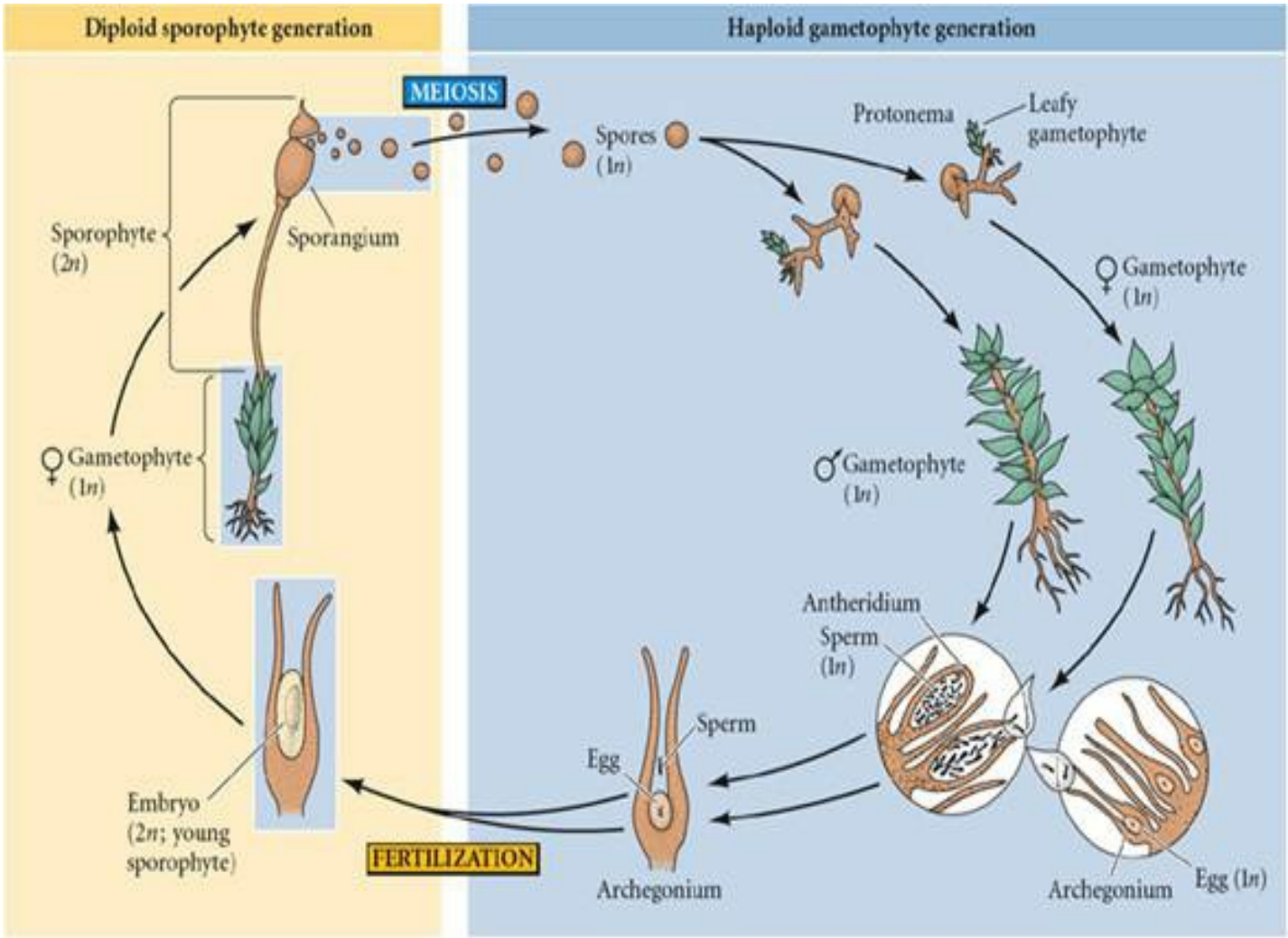
(b)DIPLONTIC LIFE CYCLE:- The dominant phase alga is diploid. It gives rise to haploid gametes through meiosis. Gametes unit & the zygote regenerates diploid phase.

(c)DIPLOHAPLONTIC LIFE CYCLE:- It has well developed multicellular haploid & diploid phase. These are respectively called gametophyte & sporophyte. Haploid gametophyte produce haploid gametes. Fusion product of gametes grows directly into diploid sporophytes. Sporophytes produce haploid spores by meiosis. The meiospores germinate into new gametophyte.



2. Explain briefly the alternation of generation in bryophytes?

Ans. The life cycle of moss represesents two distinct generations GAMETOPHYTIC & SPOROPHYTIC. Moss plant is a gametophyte. Spore is the beginning of gametophytic generation. It develops into protenema which give rise to male & female gametophytes. Gametophyte consists of green thallus having archegoniophores & antheridiophores which bear sex organs & the gametes are produced in them either monoecious or diecious. Club shaped antheriduim bears biflagellate sperms or antherozoids. Flask shaped archegonium encloses the female egg. Zygote is formed after the fertilization of male & female gametes with the help of water. Repeated divisions of the zygote give rise to the embryo (2N) which soon develops into sporophyte. The sporophyte of moss gets differenliated into three parts foot seta & capsule. Inside the capsule single celled spores are produced. After the dehiscence, they begin to germinate & give rise to protonema to start the cycle again. Gametophytic Generation alternates the sporophytic generation.

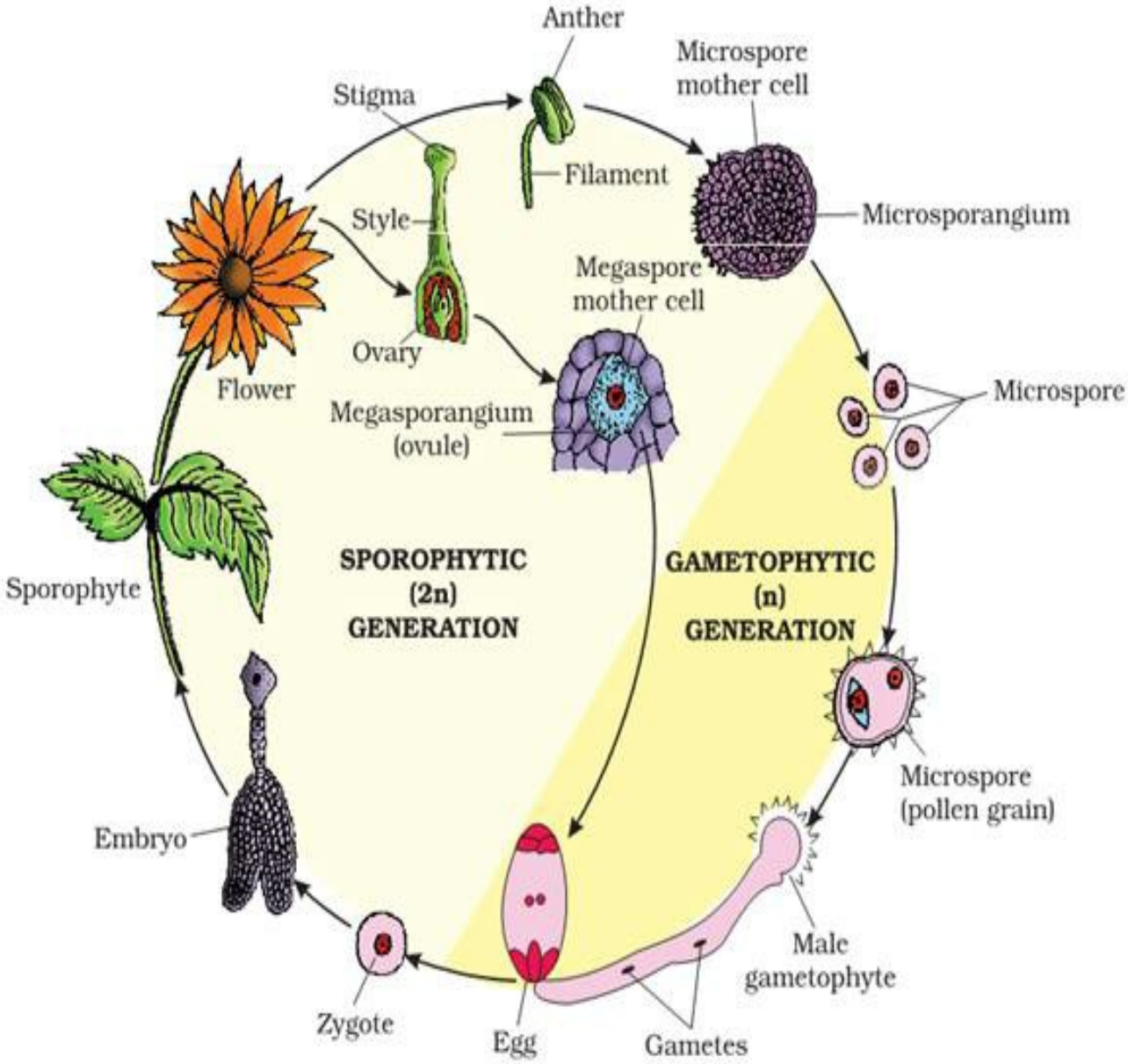


3.Describe the common mode of reproduction in Angiosperms.

Ans. Stamens & pistils are the two reproductive parts of a flower. The stamen consist of a slender filament with anthers at the tip. Each pistil is made of three parts- ovary, style & stigma. Ovary contains one to many ovules. Each ovule contains megaspore mother cell it produces four haploid megaspores after meiosis of them three degenerate & remaining one is functional megaspore. It divides by meiosis forming megagametophyte. It consists of 8 haploid nuclei embedded in cytoplasm of which 3 cells lie at the micropylar end & 3 antipodal lie at chalazal end. The two remaining nuclei move to centre to make a diploid nucleus.

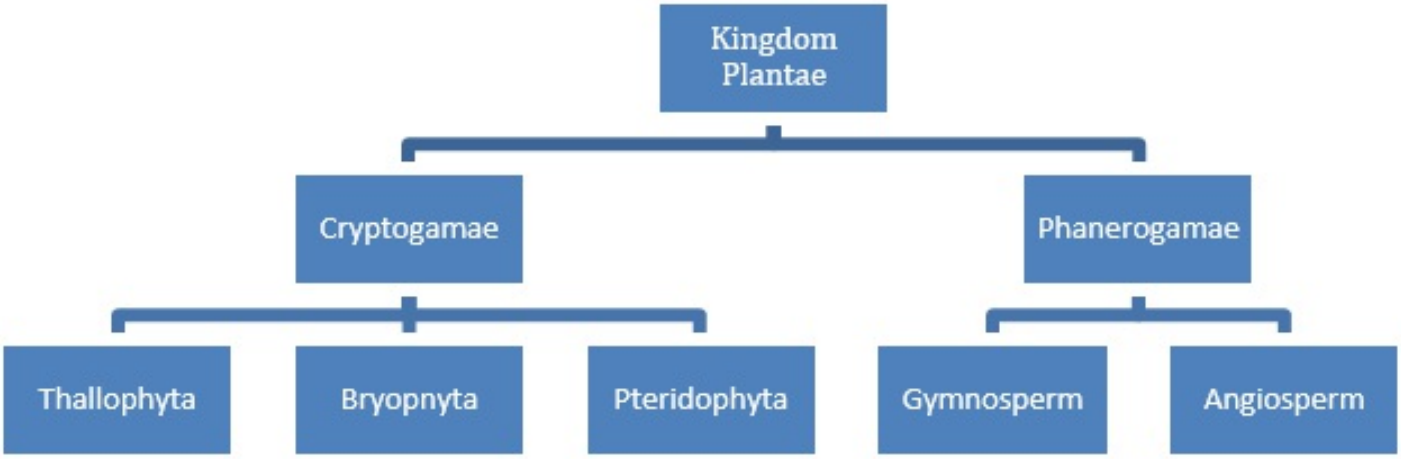
The anthers have pollen sac & contains many microspore mother cells. Each of them produces four haploid microspores after meiosis & each becomes a microgametophyte. It contains two nuclei generative nucleus & tube nucleus. The pouen iscarried away by air & other agencies & reaches stigma of pistil of same or difference plants. This process is called pollination. Pollen grains germinates & produces a pollen tube it grows within style & reaches ovule of ovary. The generative nucleus divides pollen tube producing two male gametes.

On reaching ovule, pollen tube burst to release male gamtes. One of the two gametes fertilise egg & forms a diploid zygote. Other male gamete fertilizes with polar nuclei to form triploid endosperm. This is known as double fertilization.



4.Classify plant kingdom?

Ans.



(i) Thallophytic:- plant body is thallus i.e. not differentiated into root, stem & leaves eg. chlorella, ulothrix, spirogyra etc.

(ii) Bryophyta:- Amphibious in habit, water is necessary for fertilization, Vascular tissues are absent eg. Riccia, Marchantia, funaria.

(iii) Pteridophyta:- plant body is differentiated into distinct underground stem like rhizome bearing roots & aerial shoots with leaves. They are called “primitive vascular plants “ eg. equistem, Adiantum, pteris

(iv) Gymnosperm:- seeds are naked eg. cycas, pinus, cedars

(v) Angiosperm:- seeds are protected inside the friuts eg.**(i)** monocotyledones eg. grass, maize, rice & **(ii).** Dicotyledons eg gram, pea, sunflower.