

Chapter: 09

Kingdom Plantae

Objective

- The earliest group of vascular plants is:
☐ (A) Pteropsida ☒ (B) Psilopsida ☐ (C) Sphenopsida ☐ (D) Lycopsida
- Tracheophytes are called vascular plants because of the presence of:
☐ (A) Spore ☒ (B) Vascular tissue ☐ (C) Gamete ☐ (D) None of these
- The tracheophytes are further sub - divided into sub-divisions?
☐ (A) 1 ☐ (B) 2 ☐ (C) 3 ☒ (D) 4
- Which of the following is a modified leaf?
☐ (A) Thorn ☐ (B) Tendril ☐ (C) Both A & B ☒ (D) Flower
- The process of evolution of leaf was completed in more than:
☐ (A) 15 - 16 million year ☐ (B) 15 - 17 million year
☐ (C) 15 - 19 million year ☒ (D) 15 - 20 million year
- Which of the following were the first plants that formed true leaves and roots?
☐ (A) Ferns ☒ (B) Lycopods ☐ (C) Megaphylls ☐ (D) Psilopsids
- When the form is immature and young, it is coiled, this pattern of development is called:
☐ (A) Reticulate ☐ (B) Circumnutation ☐ (C) Nutation ☒ (D) Circinate vernation
- Large leaves having divided veins and veinlets with an expanded leaf blade or lamina are known as:
☐ (A) Microphylls ☐ (B) Compound leaf
☒ (C) Megaphylls ☐ (D) Frond
- Arrangement of unequal dichotomies in one plane is termed as:
☐ (A) Webbing ☒ (B) Planation ☐ (C) Fusion ☐ (D) Overtopping
- The leaves are called fronds in class:
☐ (A) Sphenopsida ☐ (B) Gymnospermae ☒ (C) Filicineae ☐ (D) Angiospermae
- Sori are protected by the bent margin of the leaflet, forming false:
☐ (A) Annulus ☒ (B) Indusium ☐ (C) Capsule ☐ (D) Stomium
- The leaves bearing sporangia are called:
☐ (A) Leaflets ☐ (B) Megaphylls ☐ (C) Sporangophylls ☒ (D) Sporophylls
- All seed producing plants are called:
☐ (A) Bryophytes ☒ (B) Spermatophytes ☐ (C) Tracheophytes ☐ (D) Pteridophytes
- Technically a seed may be defined as a fertilized:
☐ (A) Cilia ☐ (B) Oospore ☒ (C) Ovule ☐ (D) Egg
- The microspores produced inside microsporangia germinated to form:
☐ (A) Male gametophyte ☐ (B) Microgametophyte
☒ (C) Both A & B ☐ (D) Female gametophyte

16. It is a dry , indehiscent fruit in which fruit wall is completely fused with seed coat:
 (A) Legume (B) Testa **(C) Caryopsis** (D) Dryopsis
17. Development of protective layers around megasporangium is called:
 (A) Microsporangium (B) None of these (C) Embryo sac **(D) Integument**
18. The distal end of the megasporangium became modified for capturing:
 (A) Zygote (B) Seed **(C) Pollen** (D) Fruit
19. An egg containing female gamelophyte called an:
 (A) Sporangium **(B) Embryosac** (C) Megaspore (D) None of these
20. Ginkgo belongs to class:
 (A) Anthoceropsida (B) Filicinease **(C) Gymnospermae** (D) Angiospermae
21. The term gymnospermae literally means:
 (A) Enclosed seeded (B) Open seeded (C) Seedless **(D) Naked seeded**
22. Gymnosperms consitute about one - third of the world:
 (A) Vegetables (B) Furnitures (C) Fruits **(D) Forests**
23. The megaporophylls bearing ovules are not folded and joined at the margins to form an ovary in:
 (A) Monocotyledonae **(B) Gymnospermae** (C) Dicotyledonae (D) Filicineae
24. The megasporophylls bearing ovules are not folded and joined at the margins to form an:
(A) Ovary (B) Fruit (C) Seed (D) Ovule
25. In angiosperm , megaspore develop into female gemetophyte which consist of:
 (A) 9 Cells **(B) 7 Cells** (C) 5 Cells (D) 3 Cells
26. make up 235,000 of the 360,000 known species of plants:
 (A) Ferns (B) Bryophytes **(C) Angiosperms** (D) Gymnosperms
27. The microspore divides by mitotic divisions to form:
 (A) Two male gametes (B) Fusion nukes (C) The tube nucleus **(D) Both A & C**
28. Female gametophyte in flowering plants is:
 (A) Embryo sac (B) Archegonium **(C) Seed** (D) Ovary
29. An ovule is an integumented in dehiscent:
 (A) Seed **(B) Megasporangium** (C) Sporangium (D) Microporangium
30. The interval of time unit the completion of next division is known as:
 (A) Growth (B) Reproductive time **(C) Generation time** (D) Interphase
31. After fertilization ovule is changed into:
 (A) Flower **(B) Seed** (C) Fruit (D) Ovary
32. The part of flower which develops into fruit is:
 (A) Ovule wall (B) Seed **(C) Ovary** (D) Flower
33. After fertilization is changed into a seed:

- ☐ (A) Flower ☐ (B) Ovary ☐ (C) Fruit ☒ (D) Ovule
34. The megasporangium after fertilization is transformed into a seed and the integuments become:
- ☐ (A) Embryo sac ☒ (B) Seed coats ☐ (C) Fruit walls ☐ (D) Fruit
35. Ovary wall develops into the:
- ☐ (A) Vegetable ☐ (B) Seed coats ☒ (C) Fruit ☐ (D) Pericarp
36.occur in angiosperm life cycle.
- ☐ (A) Single fertilization ☐ (B) Fertilization
☒ (C) Double fertilization ☐ (D) None of these
37. Double fertilization is a characteristic of:
- ☐ (A) Bryophytes ☒ (B) Angiosperms ☐ (C) Mosses ☐ (D) Gymnosperms
38. The fusion nucleus then form endosperm cell.
- ☐ (A) Haploid ☐ (B) Diploid ☐ (C) None of these ☒ (D) Triploid
39. In double fertilization formation occur.
- ☐ (A) Dicot ☒ (B) Zygote ☐ (C) Fruit ☐ (D) Monocot
40. Second male gamete (n) fuses with another female cell called (2n).
- ☐ (A) Fusion ☐ (B) Gameto - genesis ☒ (C) Fusion nucleus ☐ (D) Nucleus
41. Which one of the following is the characteristics of monocots?
- ☐ (A) Netted veins ☐ (B) 4 or 5 petals
☒ (C) Scattered vascular bundles in stem ☐ (D) Woody stems
42. The class Angiospermae is divided into two sub - classes according to the number of cotyledons in the:
- ☐ (A) Seed ☐ (B) Zygote ☒ (C) Embryo ☐ (D) None of these
43. Monocot have veins:
- ☐ (A) Both B & C ☐ (B) Net ☒ (C) Parallel ☐ (D) None of these
44. Which one is an example of non-vascular plants?
- ☐ (A) Psilotum ☐ (B) Adiantum ☐ (C) Rhynia ☒ (D) Marchantia
45. Member of subdivision hepaticopsida are commonly called:
- ☐ (A) Club mosses ☒ (B) Liver worts ☐ (C) Hornworts ☐ (D) Horstails
46. Mosses are:
- ☐ (A) Tracheophytes ☐ (B) Spermatophytes ☒ (C) Bryophytes ☐ (D) Arthropytes
47. A haploid spermatozoid fuses with haploid egg to produce diploid:
- ☐ (A) Gamete ☐ (B) Spore ☐ (C) Oosphere ☒ (D) Oospore
48. Known species of plants are about:
- ☐ (A) 460,000 ☒ (B) 360,000 ☐ (C) 160,000 ☐ (D) 260,000
49. Kingdom plantae mainly includes eukaryotic , autotrophic , multicellular , non motile organisms which develop from:
- ☒ (A) Embryo ☐ (B) Seed ☐ (C) Zygote ☐ (D) None of these

50. Plant cells have cell wall outer to cell membrane which is composed of:
 (A) Flagellin (B) Glucose (C) Cellulose (D) Chitin
51. Production of two types of gametes is called:
 (A) Heterogamy (B) Sporophyte (C) Homogamy (D) Gametophyte
52. The bryophytes are non-vascular plants:
 (A) Psilopsida (B) Pteropsida (C) Sphenopsida (D) Lycopsida
53. Which plants are said to be the amphibians of the plant world?
 (A) Angiosperms (B) Spermatophytes
 (C) Bryophytes (D) Trachaeophytes
54. Amphibious plants belong to group:
 (A) Phycopsida (B) Pteridophyta (C) Bryophyta (D) Angiospermae
55. Which is a Bryophyte?
 (A) Ferns (B) Whisk ferns (C) Club mosses (D) Mosses
56. First plants to colonize land were:
 (A) Algae (B) Pteridophytes (C) Bryophytes (D) Trachaeophytes
57. The sporophyte of bryophytes is usually differentiated into foot, seta and:
 (A) Calyptra (B) Protonema (C) Slime (D) Capsule
58. The sporophyte is diploid ($2n$) which produces haploid spores by:
 (A) Nuclear mitosis (B) Binary fission (C) Meiosis (D) Mitosis
59. Bryophytes male sex organ is called:
 (A) None of these (B) Both C & D (C) Antheridia (D) Archegonia
60. There is an in the life cycle of bryophytes:
 (A) Lytic cycle (B) None of these
 (C) Alternation of generations (D) Sexual reproduction
61. The sporophyte of bryophytes is:
 (A) Tetraploid (B) Triploid (C) Diploid (D) Haploid
62. In bryophytes, fertilization takes place in:
 (A) Embryo sac (B) Megasporangium (C) Microsporangium (D) Water

Fill in the blanks

- Q1: The sporophyte is and generation and the gametophyte is and
- Q2: The motile asexual reproductive cells are characteristics of and are called
- Q3: The sexual reproduction is said to be oogamous or heterogamous if the two fusing gametes are
- Q4: In the stem of Monocotyledons the bundles are while in the stem of Dicotyledons they are
- Q5: The double fertilization is the characteristic feature of

- Q6: Stem roots and leaves are the parts and lowers, fruits and seeds are the parts of the plant.
- Q7: is the phenomenon of the production of two kinds of spores in the plants.
- Q8: The naked-seeded plants are included in the group

Answers

- | | |
|---|--|
| 1. Dependent , diploid , independent , haploid in bryophytes | 2. Liverworts , gemmae |
| 3. Non-identical and egg is immotile | 4. Scattered , arranged in a ring |
| 5. Angiosperm | 6. Vegetative , reproductive |
| 7. Heterospory | 8. Gymnosperm |

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Kingdom Plantae



Subjective

Q1: **What is Oospore?**

Ans: A thick walled zygote that is formed after the fertilization of an Oospore.

Q2: **Define a spike.**

Ans: A racemose inflorescence is which the flowers are sessile and borne on an elongated axis as in wheat.

Q3: **Are all the seed plants also known as the flowering plants?**

Ans: **No**, only the angiosperms are also called flowering plants but not the gymnosperms.

Q4: **Which are the probable ancestors of bryophytes?**

Ans: These are the green algae.

Q5: **Name the most primitive group of vascular plants?**

Ans: It is the Psilopsida.

Q6: **Name a heterosporous lycopsid.**

Ans: It is the Selaginella.

Q7: **What is a sorus in ferns?**

Ans: A group of sporangia is known as a sorus in Adiantum.

Q8: **What is prothallus?**

Ans: The gametophyte of fern is also called as the prothallus. It has leaf like shape.

Q9: **What does a stamen of flower consist of?**

Ans: The stamen consists of a filament and an anther.

Q10: **From which part of the flower fruit is formed?**

Ans: The fruit is formed from the ovary of the flower.

Q11: **How many sperms are carried by one pollen tube?**

Ans: One pollen tube carries two sperms.

Q12: **What is scientific name of Kachnar?**

Ans: It is Bauhinia variegata.

Q13: **Which drugs are obtained from Atropa belladonna and Datura?**

Ans: These drugs are atropine and daturin.

Q14: **What are the names of the pea family?**

Ans: The pea family is called Papilionaceae or Fabaceae.

Q15: **Write down the names of the parts of typical carpel.**

Ans: The parts of a typical carpel of flower are the ovary, style and stigma.

Q16: **What is sporophyll?**

Ans: A leaf bearing sporangia is called a sporophyll.

Q17: **State some examples of important ferns.**

Ans: These are Dryopteris, Pteridium, Adiantum and Pteris.

Q18: **Which vascular plant first evolved true roots and leaves?**

Ans: These were the lycopods.

Q19: **Classify horsetails.**

Ans: Kingdom Plantae, division Tracheophyta and sub-division Sphenopsida.

Q20: **What is a thallus i.e., thalloid plant body?**

Ans: The body of plant which is not differentiated into root, stem and leaves is called a thallus or thalloid plant body.

Q21: **What are paraphyses in mosses?**

Ans: In mosses, paraphyses are the sterile hairs which lie between the antheridia and the archegonia.

Q22: **How do the psilopsids manufacture their food when they lack leaves?**

Ans: The aerial branches of psilopsids are green and photosynthesis.

Q23: **Explain indusium.**

Ans: Indusium is flap of tissues that partially or completely covers each sorus in certain ferns.

Q24: **Explain racemose inflorescence.**

Ans: A racemose inflorescence is that in which the flowers are formed on individual pedicels on the main axis.

Q25: **Define didynamous condition.**

Ans: Having two long stamens and two short stamens in single whirl.

Q26: **What is perianth?**

Ans: The structure that protects the developing reproductive parts of the flower.

Q27: **What is the principal function of xylem?**

Ans: The principle function of xylem in the plants is the upward transportation of water and solutes.

Q28: **What are the seed producing plants normally called?**

Ans: The seed producing plants are normally called spermatophytes.

Q29: **What is compound leaf?**

Ans: A leaf, the blade of which is divided into several pieces or leaflets is called a compound leaf.

Q30: **Where do the ferns grow?**

Ans: The ferns grow in moist and shady places on the hills and in the plants.

Q31: **How are ferns better adapted to life on land than liverworts and mosses?**

Ans: Two ferns are better adapted to life on land than liverworts and mosses:

- Sporophyte and gametophyte are independent generations.
- Reproduction is not dependent on water.

Q32: **Which of the following are nutritionally self supporting:**

(i) Mature liverwort and moss gametophyte.

(ii) Mature liverwort and moss sporophyte.

Ans: Mature liverwort and moss gametophyte.

Q33: **The chance of survival and development of wind blown pollen grains are much less than those of spores of Adiantum. Comment on this statement.**

Ans: Although spores of Adiantum are also dispersed by wind, however when a spore falls on a moist soil, it germinates at suitable temperature and produces a haploid gametophyte or prothallus. But in case of wind-blown pollen grains, if they fall on soil, they are wasted. For their survival and development it is must for them to fall on the stigma of flower.

Q34: **Account for the fact that megaspores are large and microspores are small.**

Ans: Megaspores are large since they have to store food for the growth of embryo.

Q35: **What important advances have angiosperms made towards the seed plant life?**

Ans: One of the most significant events in the history of land plants was the development of seed habit. It was an important change in the reproductive system of the vascular plants. Technically a seed may be defined as a fertilized ovule. An ovule is an integumented indehiscent megasporangium, integuments are specialized protective coverings around megasporangium which vary in number. Megasporangium is also called Nucleus. All seed producing plants are called spermatophytes.

Major steps in Evolution of Seed:

The major steps associated with the evolution of seed habit are as follows:

- The evolution of heterospory.
- Retention and germination of megaspore within the megasporangium.
- Development of protective layers around megasporangium.
- Reduction to a single functional megaspore per sporangium.
- Development of an embryo sac within the sporangium.
- Modification of distal end of megasporangium for pollen capture.

Q36: **Write a note on the alternation of generations.**

Ans: Alternation of Generations: It is the phenomenon in the life cycle of the many plants in which haploid gametophyte and diploid sporophyte regularly alternate with each other. In the life history of bryophytes, pteridophytes and spermatophytes, there are two distinct phases or generations.

Example of Moss Plant:

Gametophyte:

- The gametophyte is the dominant generation because it is more conspicuous. It produces gametes called spermatozoid and eggs and is, therefore, called gamete producing generation. A haploid spermatozoid fuses with a haploid egg to produce diploid oospore. The oospore produces a totally different plant called sporophyte.

Sporophyte:

- The sporophyte is a less conspicuous generation, which is usually differentiated into foot, seta and capsule. Spores develop within the capsule by meiosis from spore mother cells. The sporophyte produces spores and is, therefore, called spore producing generation. Each spore on germination gives rise to the gametophyte.
- It should be noted that the generation or haploid stage begins with spores and ends at gametes, whereas the sporophyte begins with oospore and ends at spore mother cell.

Significance of Alternation of Generation:

Alternation of generation is very significant because:

- It promotes the chance of survival of organism.
- The population becomes increasingly better adapted to environment.

Q37: **What is the importance of the following:**

(i) Seed (ii) Double fertilization (iii) Heterospory.

Ans: **Seed:**

- Seed is a very important structure in angiosperms as it leads to the next generation. It has protective coverings so it can tolerate unfavorable conditions. Whenever it finds a suitable environment, it will germinate.

Double Fertilization:

- It is the phenomenon in the life of angiosperms in which one sperm fertilizes the egg forming a zygote while another sperm fertilizes the fusion nucleus to form a triploid endosperm. The zygote leads to the formation of an embryo and then a seed while endosperm has stored food which is used for the development of embryo. In certain cases, endosperm is the part of the seed and provides food for the germination of seed.

Heterospory:

- It is the condition in which plants make two types of spores i.e., microspores and megaspores, which are different morphologically, structurally and functionally. They lead to more variations in the next generations.

Q38: **To what does alternation of generation refer in the plants? Define sporophyte and gametophyte. With which stage is an adult animal comparable? How are they reproductively dissimilar?**

Ans: **Alternation of Generation:**

- It is the phenomenon in the life cycle of many plants in which haploid gametophyte and diploid sporophyte regularly alternate with each other.

Sporophyte and Gametophyte:

- The spore producing generation is called sporophyte while gamete producing generation is called gametophyte.

Reproductive Dissimilarity between Sporophyte and Gametophyte:

- The sporophyte is diploid, multicellular generation which produces spores by meiosis. The spores develop into gametophyte. The gametophyte is haploid, multicellular generation which produces gametes by mitosis. The gametes develop into sporophyte.

Q39: **What is seed? Why is the seed a crucial adaptation to terrestrial life?**

Ans: **Seed a Crucial Adaption to Terrestrial Life:**

- The seed offers maximum degree of protection to a developing embryo under the unfavorable terrestrial environment. The development and evolution of seed habit was a great success and a giant leap which ultimately enabled plants to colonize land permanently.

Seed:

- Technically a seed may be defined as a fertilized ovule. An ovule is an integumented indehiscent megasporangium. Integuments are specialized protective coverings around megasporangium which vary in number.

Chapter : 09

Kingdom Plantae



Imp.Long Questions

- Q1: Describe the adaptations of bryophytes to land habitat. (V.imp)
- Q2: Explain Hepaticopsida in detail.
- Q3: Exaplain alternation of generation and give its significance. (V.imp)
- Q4: What is the significance of alternation of generation?
- Q5: Explain shortly evolution of leaf. (V.imp)
- Q6: Describe the evolution of leaf in detail.
- Q7: Write a note on Lycopsidea. (V.imp)
- Q8: Write a note on life cycle of Adiantum.
- Q9: Name various steps involved in evolution of seed habit. (V.imp)
- Q10: Write first four steps involved in the evolution of seed habit in plants.
- Q11: Describe life cycle of angiosperms.
- Q12: Define angiosperms. Draw labelled diagram of life cycle of angiosperms and explain process of double fertilization.
- Q13: Differentiate between monocots and dicots.
- Q14: Describe the differentiation between monocotyledon and dicotyledon plants.
- Q15: Describe importance of family rosaceae.
- Q16: Describe vegetative and floral characters in family rosaceae.
- Q17: Write down economic importance of family solanaceae.
- Q18: Give economic importance of family poaceae. (v.imp)
- Q19: Write the economic importance of family poaceae..
- Q20: Describe life cycle of Pinus. (v.imp)