

MISSION M.B.B.S

Date: 31/08/2022

Subject: BOTANY

Topic : PLANT KINGDOM L6

Class: Standard XI

Instructions:

A

1. Which of the following sequences is correct with regard to the life cycle of pteridophytes?
 A. Gametophyte, spores, meiosis, sporophyte
 B. Sporophyte, meiosis, spores, gametophyte
 C. Sporophyte, mitosis, gametes, zygote
 D. Gametophyte, meiosis, gametes, zygote

Life cycle of pteridophytes (haplo-diplontic life cycle):



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2. Which of the following plants produces cones or strobili?

- A. *Funaria*
- B. *Sphagnum*
- C. *Equisetum*
- D. *Pteris*

Cones or strobili are compact structures formed due to the aggregation of sporophylls. Sporophyll is a fertile leaf that bears sporangia.

All gymnosperms produce cones and a few pteridophytes like *Selaginella* and *Equisetum* also produce cones.

Pteris is a pteridophyte and does not produce cones.
Funaria and *Sphagnum* are bryophytes.

3. Which of the following is a heterosporous plant?

- A. *Pteris*
- B. *Adiantum*
- C. *Salvinia*
- D. *Dryopteris*

A heterosporous plant produces two different kinds of spores, macro (large) and micro (small) spores, which are female and male spores respectively. Most of the pteridophytes are homosporous and produce only one kind of spore. But very few pteridophytes like *Selaginella* and *Salvinia* are heterosporous. *Pteris*, *Adiantum* and *Dryopteris* are homosporous.

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4. Prothallus is

- A. dependent
- B. lacks sex organs
- C. requires a damp place to survive
- D. achlorophyllous

Prothallus is the gametophyte of pteridophytes. Gametophyte in pteridophytes is independent, bears sex organs and is green in colour due to the presence of chlorophyll pigments. Pteridophytes are restricted in distribution to narrow geographical regions because they need damp places to survive and need water for fertilisation.

5. Pteridophytes resemble bryophytes in

- A. having dominant sporophytic phase
- B. having multicellular parasitic gametophyte
- C. having multicellular free living gametophyte
- D. having vascular tissues

Bryophytes have a multicellular, independent and dominant gametophyte on which the sporophyte is dependent for nutrition.

Pteridophytes have independent sporophyte and gametophyte phases. Bryophytes are non-vascular plants and lack vascular tissues, xylem and phloem whereas pteridophytes have vascular tissues. Hence, pteridophytes resemble bryophytes in having free-living gametophytes.

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6. Gametophyte and sporophyte are free-living in

- A. *Funaria*
- B. *Pteris*
- C. *Marchantia*
- D. *Polytrichum*

Gametophyte and sporophyte are free-living in pteridophytes only. Of the given options, *Pteris* is the only pteridophyte. *Funaria*, *Marchantia* and *Polytrichum* are bryophytes in which the sporophyte is dependent on gametophyte.

7. Match the following:

	Column I	Column II
A. Lycopsida	1. <i>Equisetum</i>	
B. Sphenopsida	2. <i>Psilotum</i>	
C. Pteropsida	3. <i>Adiantum</i>	
D. Psilopsida	4. <i>Selaginella</i>	

- A. A-1, B-2, C-3, D-4
- B. A-4, B-3, C-2, D-1
- C. A-4, B-1, C-3, D-2
- D. A-4, B-3, C-1, D-2

Lycopsida includes members like *Selaginella*, *Lycopodium*.

Sphenopsida includes a single genus *Equisetum*, commonly known as horsetail.

Pteropsida includes ferns like *Pteris*, *Dryopteris* and *Adiantum*.

Psilopsida includes primitive pteridophytes like *Psilotum*.

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8. In pteridophytes, meiosis occurs during

- A. gamete formation
- B. zygote formation
- C. spore formation
- D. both a and c

In pteridophytes, meiosis occurs during spore formation.



Sporophyte bears sporophylls. Sporophylls have sporangia with spore mother cells (2n). The spore mother cells, which are diploid, undergo meiosis to form haploid spores. These spores germinate to form haploid gametophytes.

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9. What will be the number of chromosomes in prothallus, antheridium, antherozoids, spores, if the cell of the archegonium of a fern plant has 20 chromosomes?

- A. 20, 20, 20, 20
- B. 40, 40, 40, 40
- C. 20, 20, 40, 40
- D. 40, 40, 20, 20

The gametophyte of pteridophytes is called prothallus.

Haploid spores germinate to form gametophytes in pteridophytes. Hence, the gametophyte is haploid.

Male gametophyte bears male sex organs, antheridium and female gametophyte bears female sex organs, archegonium. Sex organs are haploid and hence, produce gametes by mitosis.

Male gametes are called antherozoids and they are haploid.

Prothallus, antheridium, archegonium, antherozoids and spores are haploid structures. Hence, all of these will have 20 chromosomes.

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10. Which among the following is a hydrophytic pteridophyte?

- A. *Lycopodium*
- B. *Equisetum*
- C. *Azolla*
- D. *Selaginella*

Hydrophytes are plants which grow only in or on water.

Pteridophytes are land plants with few exceptions like *Azolla*. *Azolla* is an aquatic fern.



Lycopodium, *Equisetum* and *Selaginella* are terrestrial pteridophytes.