BOTONY SEP SYLLABUS FOR 2ND SEM
2-mark QUESTION answers

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1. **Antheridium**: Male sex organ in bryophytes and pteridophytes, producing motile male gametes (antherozoids).

2. **Archegonium**: Female sex organ in bryophytes and pteridophytes, flask-shaped and produces a single egg.
3. **Scales of *Riccia***: Multicellular structures on the lower side of the thallus that help in water retention and protection of rhizoids.
4. **Alternation of Generation**: Life cycle alternating between a haploid gametophyte and a diploid sporophyte phase.
5. **Monoecious**: A plant that bears both male and female reproductive organs on the same individual (e.g., *Marchantia*).
6. **Dioecious**: A plant species where male and female reproductive organs are on separate individuals (e.g., *Cycas*).
7. **Structure and Function of Scales of *Marchantia***: Small, multicellular appendages that cover rhizoids and help retain moisture and protect the growing region.
8. **Antheridiophore of *Marchantia***: Stalked structure bearing antheridia on a disc-shaped head for male gamete production.
9. **Archegoniophore of *Marchantia***: Stalked female structure with rays hanging below the disc, bearing archegonia on their underside.

10. **Vegetative Reproduction in *Marchantia***: Occurs via gemmae produced in gemma cups, which are dispersed by water.
11. **Antheridial Chamber of *Anthoceros***: A cavity in the thallus containing antheridia, often embedded and surrounded by mucilage.
12. **Pseudoelaters**: Elongated, sterile cells in *Anthoceros* capsule that assist in spore dispersal by hygroscopic movement.
13. **Capsule of *Anthoceros***: Cylindrical, horn-like sporophyte containing spores and pseudoelaters, dehisces longitudinally.
14. **Hornwort**: Bryophyte group with horn-like sporophytes, single chloroplast per cell, and symbiosis with cyanobacteria.
15. **Liverworts**: Bryophytes with thalloid or leafy gametophytes, reproduce via gemmae or sexually; e.g., *Riccia*, *Marchantia*.
16. **Diagram of Sporangium of *Funaria***:

17. **Gametophytes of *Funaria***: Dominant leafy green structure that bears sex organs—antheridia and archegonia.
18. **Rhizoids**: Hair-like structures that anchor bryophytes and pteridophytes and absorb water and minerals.
19. **Ligule**: Small, tongue-like structure at leaf base in *Selaginella*, used for water absorption and protection.
20. **Sori**: Clusters of sporangia on the underside of fern leaves, involved in spore production.
21. **Structure of *Equisetum***: Jointed stem with nodes and internodes, whorled branches, and silica-rich epidermis.

22. **Heterospory**: Production of two types of spores: microspores (male) and megaspores (female), e.g., *Selaginella*.
23. **Coralloid Root**: Special roots in *Cycas* with symbiotic cyanobacteria, aiding in nitrogen fixation.
24. **Megasporophyll and Microsporophyll of *Cycas***: Megasporophylls are leaf-like and bear ovules; microsporophylls bear pollen sacs.
25. **Male Cone of *Cycas***: Large, compact structure made of microsporophylls producing microspores (pollen grains).
26. **Megasporophyll and Microsporophyll of *Pinus***: Megasporophylls form ovule-bearing female cones; microsporophylls form pollen-bearing male cones.
27. **Pinus Needle**: Modified leaf adapted to dry conditions, with sunken stomata and thick cuticle.
28. **Male and Female Cone of *Gnetum***: Male cones contain microsporangia; female cones contain ovules, both are compound strobili.
29. **Impression**: A shallow imprint of an organism on rock surface; no organic material is preserved.
30. **Compression**: Fossil formed by pressure flattening an organism, often with carbon residue preserved.
31. **Moulds**: Hollow impressions left in rock after the decay of the organism.
32. **Petrifaction**: Process where organic material is gradually replaced by minerals, turning it to stone.
33. **Compaction**: Fossilization where sediment pressure flattens organic remains, reducing their volume.
34. **Casts**: 3D replica of an organism formed when a mould is filled with minerals or sediment.

35. **Pseudofossil**: Naturally occurring rock patterns that resemble fossils but are not of biological origin.
36. **Radiocarbon Dating**: Technique using decay of carbon-14 to determine the age of organic materials up to 50,000 years old.
37. **Circinate Vernation**: The coiled arrangement of young fern fronds that unroll as they mature.
38. **Gemma Cups**: Cup-like structures in *Marchantia* that produce gemmae for asexual reproduction.
39. **Actinostele**: Type of stele with radiating xylem arms surrounded by phloem; seen in *Lycopodium* roots.
40. **Prothallus**: Free-living, heart-shaped gametophyte of ferns, bearing both antheridia and archegonia.
41. **Cambium**: Lateral meristem that produces secondary xylem (wood) and phloem, enabling secondary growth.
42. **Rhizome**: Horizontal, underground stem storing nutrients and aiding vegetative propagation (e.g., fern rhizomes).
43. **Apospory**: Development of gametophyte from somatic cells of the sporophyte without spore formation.
44. **Mycorrhiza**: Symbiotic association between plant roots and fungi, enhancing nutrient and water uptake.
45. **Phellum, Phellogen, Phelloderm = Periderm**: Secondary protective tissue; phellogen (cork cambium) produces phellum (cork) and phelloderm (inner tissue).
46. **Resurrection Plant**: Plant that survives extreme desiccation and revives when water is available (e.g., *Selaginella lepidophylla*).
47. **Vascular Canal**: Passage in vascular plants that conducts water (xylem) or nutrients (phloem).

48. **Carinal Canal**: Water-conducting canal in *Equisetum*, formed from protoxylem disintegration.
49. **Father of Paleobotany**: **Adolphe Brongniart** is considered the father of paleobotany for classifying fossil plants.
50. **Paleobotany**: The scientific study of fossil plants to understand plant evolution and ancient environments.
51. **Why We Study Fossils**: To learn about plant evolution, past climates, extinction events, and ancient biodiversity.
52. **Fossilization**: Natural process of preserving organisms in sediment over time, converting them into fossils.
53. **Types of Fossils**: Includes impressions, compressions, moulds, casts, petrifactions, and amber inclusions.
54. **Conditions of Fossilization**: Rapid burial, absence of oxygen, low microbial activity, and presence of hard parts.
55. **Half-life of Fossil (C-14)**: The half-life of carbon-14 is **5730 years**, used in dating organic fossils.