**Dr. OP SINGH CLASSES**

**SHEET FOR COMPETITION**

**Differences Amongst Red, Brown and Green Algae**

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| ***Red Algae*** | ***Brown Algae*** | ***Green Algae*** |
| 1. Mostly marine | 1. Mosttly marine. | 1. Mostly fresh water and subaerial. |
| 2. Unicellular species fewer. | 2. Unicellular species absent. | 2. Unicellular species abundant. |
| 3. Thylakoids are unstacked. | 3. Thylakoids occur in groups of threes. | 3. Thylakoids are stacked in groups   of 2-20. |
| 4. Chlorophyll- a and d type. | 4. Chlorophyll- a and c type. | 4. Chlorophyll- a and b type. |
| 5. Fucoxanthin may be present. | 5. Fucoxanthin is abundant. | 5. Fucoxanthin is absent. |
| 6. Phycobilins present. | 6. Phycobilins absent. | 6. Phycobilins absent |
| 7. Reserve food is floridean starch. | 7. Reserve food is laminarin. | 7. Reserve food is starch. |
| 8. Motile stages are absent. | 8. Present ; flagella 2, lateral and  unequal. | 8. Present ; flagella 2 to 8 apical and   equal. |
| 9. Cell wall contains cellulose and  sulphated | 9. Cell wall contains cellulose and non-sulphated phyco- colloids | 9. Cell wall is of cellulose. |

**Differences between Fungi and Algae**

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| *Fungi* | | *Algae* | |
| 1. | Fungi live in aquatic, subaquatic and terrestrial habitats. | 1. | Algae do not occur in terrestrial habitats. They are aquatic or subaquatic. |
| 2. | Fungi lack chlorophyll and are heterotrophic in nutrition. | 2. | Algae usually possess chlorophyll and are autotrophic in nutrition. |
| 3. | They absorb organic nutrients from their environment. | 3. | They absorb inorganic nutrients from their environment. |
| 4. | Fungi usually live in darker places. | 4. | Algae live in well lighted areas. |
| 5. | The filaments or hyphae are usually branched. | 5. | The filaments, when present, may be branched or unbranched. |
| 6. | The cell wall is commonly made of chitin or fungus cellulose. | 6. | Cell wall is made of true cellulose. |
| 7. | Food reserve consists of glycogen and oil globules. Starch is never formed. | 7. | Food reserve is starch (or related polysaccharide) and oil globules. |
| 8. | In higher forms, karyogamy is delayed after completion of plasmogamy. | 8. | Plasmogamy is immediately followed by karyogamy. |
| 9. | There is progressive reduction of sexuality in fungi. | 9. | There is progressive evolution of sex amongst algae. |

**Differences between Antheridia and Archegonia**

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| *Antheridia* | *Arcgegibua* |
| 1. They are male organs of bryophytes and pteridophytes. | 1. They are female organs of bryophytes, pteridophytes and gymnosperms. |
| 2. Antheridia are generally rounded in outline. | 2. Archegonia are usually flask-shaped in outline. |
| 3. Sterile cells are absent inside. | 3. Sterile cells occur in the interior of archegonia. |
| 4. An antheridium forms a large number of male gametes. | 4. An archegonium encloses a single female gamete. |
| 5. The male gametes produced in an antheridium are usually motile. | 5. The female gamete or egg present in an archegonium is usually non-motile. |

**Differences between Liverworts and Mosses**

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| *Liverworts* | *Mosses* |
| 1. The plant body is dorsiventral. | 1. The plant body has a radial symmetry. |
| 2. The plants may be thallose or foliose. | 2. The plants are always leafy. |
| 3. Leaves, when present, are without a midrib. | 3. The leaves generally have a midrib. |
| 4. Branching is generally dichotomous. | 4. Branching is lateral and extra-axillary. |
| 5. Rhizoids are unicellular. | 5. Rhizoids are multicellular. |
| 6. Capsule often possesses elaters. | 6. Elaters are absent. |
| 7. Peristome teeth are absent. | 7. Peristome teeth occur towards the apical region of the capsule. |
| 8. Columella is generally absent. | 8. Capsule contains a sterile columella. |
| 9. A protonema stage is absent. | 9. A filamentous protonema occurs. |

**Differences between Bryophyteteridophytes**

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| *Bryophytes* | *Pteridephytes* |
| 1. Plant body is gametophyte. | 1. Plant body is sporophyte. |
| 2. Vascular tissues are absent. | 2. Vascular tissues are present. |
| 3. Sporophyte is parasitic over gametophyte. | 3. Botyh sporophyte and gametophyte are independent. |
| 4. Plant body can be thallose or foliose. | 4. Plant body is differentiated into stem, leaves and roots. |
| 5. True stem and leaves are absent. | 5. Plants possess true stem and leaves. |
| 6. Roots are absent. Instead, rhizoids occur. | 6. Roots are present. |
| 7. Haploid or gametophytic phase is longer lived while sporophytic phase is shorter lived. | 7. Diploid or sporophytic phase is longer lived while gametophytic phase is shorter lived. |
| 8. Antheridium is stalked. | 8. Antheridium is sessile. |
| 9. Archegonium is commonly exposed. | 9. Archegonium is partially embedded. |
| 10. Neck of archegonium is formed of 5-6 rows of cells. | 10. Neck of archegonium has four rows of cells. |

**Differences between Microsporophyll and Megasporophyll**

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| *Microsporophyll* | *Megasporophyll* |
| 1. It bears microsporangia. | 1. Megasporophyll bears megasporangia. |
| 2. A microsporangium contains numerous microspores or pollen grains. | 2. A megasporangium usually bears one functional megaspore. |
| 3. Microspores or pollen grains are not retained. They are always shed. | 3. In seed plants, the megaspore is retained inside the megasporangium. |
| 4. The male gametophyte is formed near the female gametophyte. | 4. In seed plants, the female gametophyte is produced inside the megasporangium. Fertilisation and embryo formation occur there. |
| 5. In angiosperms, the microsporophyll is modified into stamen. | 5. In angiosperm, the megasporophyll is rolled to produce a carpel. |

**Differences between Male Gametophytes of Pteridophytes and Gymnosperms**

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| *Male Gametophyte of Pteridophytes* | *Male Gametophyte of Gymnosperms* |
| 1. A distinct male gametophyte may not be present. | 1. A distinct male gametophyte is always present. |
| 2. It contains an antheridium. | 2. An antheridium is not formed. |
| 3. Male gametes are flagellate. | 3. Male gametes can be flagellate or nonflagellate. |
| 4. Male gametes reach the female by swimming in a thin film of water. | 4. Male gametes reach the female gamete through a pollen tube. Water is not required. |

**DIFFERENCES BETWEEN FEMALE GAMETOPHYTES OF PTERIDOPHYTES AND GYMNOSPERMS**

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| *Female Gametophyte of Pteridophytes* | *Female Gametophyte of Gymnosperms* |
| 1. A distinct female gametophyte may not be present. | 1. A distinct gametophyte is always present. |
| 2. It is largely independent. | 2. Female gametophyte does not leave the parent plant. |
| 3. It is not enclosed in an ovule. | 3. It is enclosed inside an ovule. |

**DIFFERENCES IN REPRODUCTIVE ORGANS OF GYMNOSPERMS AND ANGIOSPERMS**

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|  | *Gymnosperms* |  | *Angiosperms* |
| 1. | The sporophylls are aggregated to form cones. | 1. | The sporophylls are aggregated to produce flowers. |
| 2. | Cones are generally unisexual, rarely bisexual. | 2. | Flowers are generally bisexual, rarely unisexual. |
| 3. | Cones do not possess perianth or sepals and petals. | 3. | The flowers usually contain perianth or sepals and petals. |
| 4. | Sporophyll bearing central axis is usually elongated. | 4. | Sporophyll bearing thalamus is generally short. |
| 5. | Microsporophyll often contains a broad, sterile head. Distinction into anther and filament is absent. | 5. | Microsporophyll is represented by a stamen. A stamen consists of a terminal broad anther and a lower stalk or filament. |
| 6. | Number of microsporangia per microsporophyll varies from 2 in Pinus to several hundred in *Cycas*. | 6. | Number of microsporangia or pollen sacs per stamen is commonly four, rarely two. |
| 7. | Megasporophyll is commonly woody. | 7. | Megasporophyll is delicate. |
| 8. | Megasporophyll is unrolled. | 8. | Megasporophyll is rolled to form a carpel. |
| 9. | Stigma and style are absent. | 9. | 9. The two are present. |
| 10. | The female gametophyte contains distinct archegonia. | 10. | Archegonia are absent. |
| 11. | Male gametophyte contains one or two prothalial cells, a tube cell, a stalk cell and a body cell which divides to form 2 male gametes. | 11. | Male gametophyte consists of a tube cell and a generative cell which divides to form two male gametes. |
| 12. | Only one gamete is functional as there is only one type of fertilization or generative fertilization. | 12. | There is double fertilisation, that is, both the male gametes are functional, one performing generative fertilisation and other vegetative fertilisation or triple fusion. |
| 13. | Endosperm is a pre-fertilisation structure and represents the food laden female gametophyte. | 13. | Endosperm is a post-fertilisation structure and represents a new triploid material. |
| 14. | Seeds develop exposed on the megasporophyll. A fruit is never formed. | 14. | Seeds develop inside the ovary part of the carpel which matures into a fruit. |
| 15. | The embryo may contain one to several cotyledons. | 15. | The embryo contains one or two cotyledons. |

**Differences between Dicots and Monocots**

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|  | *Dicots* |  | *Monocots* |
| 1. | There are usually two cotyledons. | 1. | The seeds contain one cotyledon. |
| 2. | Flowers are generally pentamerous or tetramerous (floral parts in sets of 5 and 4 or their multiples) | 2. | Flowers are usually trimerous (floral parts in sets of three or its multiples). |
| 3. | Pollen grains commonly have three germ pores. | 3. | Pollen grains generally possess a single germinal furrow. |
| 4. | Leaves are netveined or with reticulate venation. | 4. | The leaves possess parallel venation with a few exceptions. |
| 5. | Primary root often long lived forming tap root system. Adventitious roots occur in some cases. | 5. | Primary root is short-lived. Tap root is absent. Instead adventitious roots are found. |