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| MATRIC NUMBER: | 19/MHS01/107 |
| DEPARTMENT: | MEDICINE AND SURGERY |
| COLLEGE: | MEDICINE AND HEALTH SCIENCES |
| COURSE: | BIO 102(GENERAL BIOLOGY II) |
| ASSIGNMENT | Plant Diversity |

1. Classification of plants according to Eichler's classification of 1883

| DIVISION | CLASS |
|---------------|---|
| Thallophyta | Phycotinae (Algae) Mycotinae (Fungi) |
| Bryophyta | Hepaticae (Liverworts) Musci (Mosses) |
| Pteridopyhta | Psilotinae (Psilotum) Lycopodinae (Lycopodium, Selaginella) Equisetinae (Horsetails) Filicinae (Ferns) |
| Spermatophyta | Gymnospermae (Gymnosperms) Angiospermae (Angiosperms) |

2. The following are the importance of Algae to man:

- i. Algae serve as food for people and livestock.
- ii Algae have high iodine content thereby preventing goitre.
- iii. Algae are used in the production of drugs which ward off diseases.
- iv. Certain species of algae are harvested for food and cosmetics in the far east.
- v. Algae are used as a thickening agent in shampoo and ice cream.
- vi. Algae are considered nutritious because of their high protein content. and high concentrations of minerals, trace elements and vitamins.
- vii. Seaweeds are a source of three chemical extracts used extensively in the food, pharmaceutical, textile and cosmetic industries.
- viii. Brown algae yields Alginic acid which is used to stabilize emulsions and suspensions and is also found in products such as syrup, paint and ice cream.
- ix. Algae can act as indicators to environmental problems in aquatic ecosystem.
- x. Different species of red algae provide agar and carrageen used for the preparation of various gels used in scientific research.

3. A unicellular form of algae is Chlamydomonas.

The Chlamydomonas is found in stagnant water usually along with other forms. It has flagella for mobility and its cell is bounded by a cellulose cell wall contains organelles E.g. nucleus, mitochondria, stigma, cup-shaped chloroplast, pyrenoid, etc. The nucleus carries the genetic programme of the cell while the stigma is for photoreception. The mitochondria mediate the elaboration of energy molecules which the manufactured sugar is processed into starch in the pyrenoid.

4. Method of reproduction In Chlamydomonas:

Reproduction in this organism can be asexual or sexual.

Asexual Reproduction: Vegetative reproduction results in the production of daughter cells in which the amount and quality of genetic material in the nucleus of the mother cell equals that of the daughter cell. Mitotic divisions take place here and this maintains the quantity and quality of genetic material. This division is also responsible for increase in number of cells in

unicellular organisms and for increase in size in multicellular organisms. In Chlamydomonas, a cell about to divide loses its flagella then the cell undergoes mitotic divisions leading to the release of two daughter cells (zoospores). Increase in the population of cells in a colony is achieved by repeated mitotic divisions.

Sexual Reproduction: Certain environmental conditions such as lack of nutrients, etc may trigger the haploid daughter cells to undergo sexual reproduction instead of forming into spores. These cells form gametes with opposite mating strains which fuse in a process called isogamy to form a diploid zygote which contains two sets of chromosomes. After a period of dormancy, the zygote undergoes meiosis to produce four genetically unique haploid cells that eventually mature. In this organism, clumping occurs. The cells pair by their posterior flagellated ends and can be said to be isogamous as the pairing cells are alike. Karyogamy (fusing of nuclei) and Plasmogamy (fusing of cytoplasm) of the pairing cells takes place. Basically, two cells with haploid nuclear material undergo karyogamy to produce a single cell with diploid nuclear material. After karyogamy, the zygote undergoes two successive divisions which produce four cells and n quantity of nuclear material

5. The two types of colonial forms of algae are Pandorina and Volvox. The differences between them include:
 - a) The Pandorina colony consists of 16 cells attached to one another while the Volvox has many more cells in the colony and the number may run to the thousands and are connected with cytoplasmic strands that run through the cells.
 - b) Sexual reproduction in Pandorina is by anisogamous pairing (pairing by the flagella ends) while that of the Volvox is oogamous (the male gamete is motile while the female gamete (egg) is not motile).
 - c) The cells of the Pandorina show lower levels of specialization and differentiation than the Volvox whose cells show greater levels of differentiation of specialization.
6. A named complex form of algae is Fucus.

This is a genus of brown algae whose species are often found on rocks in the intertidal zones of sea shores. The plant body is flattened, dichotomously-branched thallus with a mid-rib, a vegetative apex, a reproductive apex at maturity and a multicellular disk (hold fast) with which plant is attached to rocky surface. The plant body also has air bladders which is believed to aid the plant to float on the waters. Various species of Fucus exist and vary in size from a few centimetres to about 2 metres in length. They also vary in terms of whether the sex cells are found in the same sexual chamber or in different sexual chambers on different plant bodies. This complex form of algae undergoes only sexual reproduction and not asexual and sexual.