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**DEPARTMENT: DENTISTRY**

**COURSE CODE: BIO 102**

**QUESTION**

1. Classify plants according to Eichler’s grouping of 1883
2. How are algae important to man
3. Describe a unicellular form of algae
4. How does this unicellular alga described in question 3 carry out its reproduction?
5. Differentiate between the 2 types of colonial form of algae: Pandorina, volvox
6. Describe a named complex form of algae

**SOLUTION**

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

**2.**

* It serves as food and livestock
* It serves as thickening agent in ice cream and shampoo
* It serves as drugs to ward off diseases
* It is used in food industry to stabilize pie filling and preserve canned meat and fish
* Brown algae yields alginic acid which is used to stabilize emulsions and suspensions: found in products such as syrup, ice cream and paint

**3.** An example of a unicellular and motile form of green algae is Chlamydomonas. It is found in stagnant water usually along with other forms. Its structure for motility is the flagella. The cell is bounded by a cellulose cell wall; contains organelles, for example, nucleus, mitochondria, stigma (eyespot), cup-shaped chlororplast, pyrenoid, etc. The nucleus carries the genetic program of the cell; the stigma is for photoreception. The mitochondria mediate the elaboration of energy molecules. Manufactured sugar is processed into starch on the pyrenoid.

**4.** Its reproduction can either be vegetative or sexual

* Vegetative reproduction: This results in production of daughter cells in which the amount and quality of genetic material in the nucleus of the mother cell is maintained in the daughter cells. This kind of cell division is called mitotic division. It is responsible for the increase in number of cells in unicellular organisms and for increase in size for multicellular organisms. In Chlamydomonas, a cell about to divide loses its flagella. Increase in population of cells in a colony is achieved by repeated mitotic division.
* Sexual reproduction: This involves union of sex cells (gametes). In Chlamydomonas, aggregation of cells in a colony occurs under favorable conditions. These cells pair by their posterior (flagellated) ends. The cytoplasm of the pairing cells fuses and the flagella are lost. The 2 nuclei fuse, this situation is essentially a fertilization process son that a zygote is formed. In other words, 2 cells each with a quality of genetic material undergo karyogamy to produce a single cell with diploid nuclear material. After Karyogamy, sometimes, the zygote undergoes two successful divisions. These two divisions which end up with four cells and with a quantity of nuclear material are together known as meiosis. The four products of meiosis are released as haploid zoospores.

**5.**

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| **Pandorina** | **Volvox** |
| Sexual reproduction is anisogamous | Sexual reproduction is oogamus |
| Unicellular motile thallus | Multicellular motile thallus |
| It’s a genus of green algae | It’s a complex form of pandorina |

**6.**

An example of a complex form of alga is fucus. It is a genus of brown algae whose species are often found on rocks in the intertidal zones of the seashores. It has a flat body, a dichotomously branched thallus with a midrib, a vegetative apex and a multicellular disk with which plant is attached to rock surface. Sexual reproduction is oogamous, sex cells are produced in conceptacles which have openings (ostioles) on the surface of the thallus.