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**COLLEGE: MEDICINE AND HEALTH SCIENCES**

**COURSE: BIO 102**

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**1)Classify plants according to Eichler’s grouping of 1883.**

**In 1883, A.W. Eichler gave a system of classification for the whole plant kingdom. It is a traditional system as well as a phylogenetic system of classification of plants.**

**Eichler classified the plant kingdom into two sub-kingdoms. They are Cryptogamae and Phanerogamae.**

**a) Cryptogamae (Gk. kryptos=concealed, gamos=marriage)**

**The cryptogams are flowerless and seedless plants. They are simple plants like algae, mosses and ferns which do not produce flowers, fruits and seeds. Cryptogams are considered as lower plants. E.G Thallophyte, Bryophyte and Pteridophyte.**

**b) Phanareogamae**

**Phanerogams are seed bearing plants. So, they are also known as spermatophytes (Gk. Sperms=seed; phyton=plant). They are differentiated into root, stem, and leaves with well-developed vascular system. Examples are Gymnosperms and Angiosperms.**

**2) How are algae of importance to man.**

**• Food for sea animals and fishes.**

**• Medicine and minerals.**

**• As a source of agar in the production of ice-cream, jellies, etc.**

**• Manufacture of Iodine.**

**• Used as fertilizers.**

**• Ornamental use.**

**3) Describe a unicellular form of algae.**

**A unicellular organism, also known as a single-celled organism, is an organism that consists of a single cell, unlike a multicellular organism that consists of multiple cells. The unicells can be motile or non-motile. Chlamydomonas represents the unicellular and motile forms of green algae. Found in stagnant water usually along with other forms.**

**4) How does this unicellular alga described in question 3 carry out its reproduction.**

**In Chlamydomonas, reproduction can either be vegetative(asexual) or sexual. Chlamydomonas asexual reproduction occurs by zoospores; sexual reproduction through isogamy.**

**• Vegetative reproduction results in production of daughter cells in which the amount of genetic material in the nucleus of the mother cell is maintained in the daughter cells. The kind of cell division which maintains the quantity and quality of a genetic material is called mitotic divisions. In Chlamydomonas, a cell about to divide loses its flagella. The cell undergoes two mitotic division leading to two nuclei, cell walls are elaborated which delimit cytoplasm around each nucleus i.e. two daughter cells(zoospores) are released.**

**• Sexual reproduction certain environmental conditions e.g. lack of nutrients or moisture may trigger the haploid daughter cells to undergo sexual reproduction. Instead of forming into spores, the haploid daughter cells form gametes that have two different mating strains which are structurally similar and are positive and negative strains. Opposite mating strains 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, a type of cell division that reduces the genetic content of a cell by half. The cell division (i.e. meiosis) produces four genetically unique haploid cells that eventually grow into mature cells.**

**5) Differentiate between the two types of colonial form of algae.**

**VOLVOX PANDORINA**

**• Sexual reproduction is oogamus. Sexual reproduction is anisogamous**

**• Multicellular motile thallus. Unicellular motile thallus.**

**• It’s a complex form of Pandorina. It’s a genus of green algae.**

**6) Describe a named formed complex of alga.**

**Spirogyra is a charophyte, a division of green algae and it’s also a filamentous green alga. It occurs in stagnant bodies of water as green floating threads, and there are more than 400 species of spirogyra in the world. Filaments are unbranched with uninucleate cells and grow by continuous cell division and fragmentation of filaments. The entire length of each cell has a characteristic spiral ribbon like chloroplast. Pyrenoids are borne on the chloroplasts and vacuoles are also visible in the cells.**

**Sexual reproduction – Its occurs at an appropriate stage of maturity. During that stage of maturity, two filaments lie side by side and protuberances (papilla) are produced on the adjacent cells of contiguous filaments.**