

NAME: UDOFIA ETIMBUK VICTORY

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ANSWERS TO ASSIGNMENT

1. Eichler's classification of plants;

THE PLANT KINGDOM

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

2. Algae are considered nutritious because of their high protein content and high concentrations of minerals, trace elements and vitamins. Algae have high iodine content therefore prevent goitre. They are a source of 3 chemical extracts used extensively in the food, pharmaceutical, textile and cosmetic industries. They are also used in the medical field.
3. A unicellular form of algae- (e.g. Chlamydomonas)
It is found in stagnant water and possesses flagella as a structure for mobility. The cell is bounded by a cellulose cell wall and contains organelles. Each organelle carries out its cellular functions. The nucleus carries the genetic programme of the cell. The stigma is for photoreception. The mitochondria mediate the elaboration of energy molecules and manufactured sugar is processed into starch in the pyrenoid. Reproduction can either be vegetative (asexual) or sexual.
4. Reproduction can either be vegetative (asexual) or sexual. In the asexual reproduction, mitotic division takes place. The daughter cell contains the same genetic make-up of the parent cell. It maintains both quantity and quality of genetic material. In Chlamydomonas, a cell about to divide loses its tail. Repeated mitotic division leads to increase in the population of the cells. In the sexual reproduction, certain environmental conditions may trigger it. Instead of forming into spores as in the asexual stage, the haploid daughter cells form gametes that have different mating strains. Opposite mating strains fuse in a process called isogamy to form a diploid zygote. After a period of dormancy, the zygote undergoes meiosis. This cell division produces four genetically unique haploid cells that eventually grow into mature cells. Sexual reproduction involves union of sex cells. In Chlamydomonas, isogamy takes place between pairs of cells. Plasmogamy later takes place and the flagella of the cells are lost. Karyogamy then takes place to produce a single cell with diploid nuclear material. A thick cell wall is secreted and dormancy takes place. After Karyogamy, the zygote undergoes 2 successive cell divisions (mitotic and meiotic). The four products of meiosis are released as haploid zoospores.

5. Differences between the 2 types of colonial form of algae.

PANDORINA	VOLVOX
1. Colony consists of 16 cells attached to one another.	Colony consists of over a1000 cells attached to one another.
2. Both gametes are motile.	Female gamete is not motile.
3. All daughter cells form new colonies.	Not all cells form colonies.

6. A complex form of alga: Fucus

They are often found on rocks in the intertidal zones of the sea shores. The plant body is flattened, dichotomously-branched thallus with a midrib, a vegetative apex, a reproductive apex at maturity and a multicellular disk. It also has air bladders. Sexual reproduction is oogamous, sex cells are produced in conceptacles which have openings on the surface of the thallus. In male conceptacles, one of the diploid cells from outgrowths of the wall of the conceptacles undergoes meiosis, the meiotic product undergoes many mitotic divisions to produce antheridium having 64 cells of which each cell develops into a biflagellate sperm that swims out of the conceptacle through the ostiole.

In the female conceptacle, similar to the situation in the male conceptacle, leads to the production of an 8 celled oogonium- each becomes an egg which is the female sex cell.

Motile sperm cell from the antheridium move through the ostiole into the female conceptacle where the eggs are fertilized and the diploid zygote are produced. Apart from the antheridia and oogonia, sterile multicellular filaments are also produced in the conceptacles which are dispersed among the antheridial and oogonial outgrowths and at the entrance into the conceptacles.

The diploid zygote germinates into a new diploid Fucus plant making the diploid the dominant generation.