UNISA university of south africa
University Examinations

DEPARTMENT OF LIFE AND CONSUMER SCIENCES

Plant Structure

BOT1501

Semester II: Assignment no. 2 Memorandum

2017

QUESTION 1

1.1 chloroplasts
1.2 grana
1.3 tissue
1.4 tendrils
1.5 heartwood
1.6 latex
1.7 chlorenchyma
1.8 corolla/perianth
1.9 pseudocarp/accessory
1.10 endosperm

(10*2 = 20)

QUESTION 2

3.1 **Autotrophic organisms** refer to "self-feeding", meaning that these organisms can produce their own organic food. For example, plants.

Heterotrophic organisms refer to "other feeding", meaning that these organisms must obtain organic food from outside their bodies. E.g. animals

3.2 **Asexual reproduction** is the production of new organisms or offspring without the interaction of male and female organisms. Different types under asexual reproduction are binary fission, budding and fragmentation. Offspring are genetically identical to a single parent. E.g. Fungi and bacteria.

Sexual reproduction is the production of new organisms or offspring that requires the fusion of the two special cells called gametes, one from a male source and one from a female source. In this type of reproduction, offspring possess unique genetic information from their parents. E.g. humans and certain plant species.

3.3 **Phonetic approach** uses "overall similarity"- all characters used. This approach focuses on the relationships among a group of organisms on the basis of the degree of similarity between them, but that similarity molecular, phenotypic, or anatomical.

Cladistics approach uses only phylogenetically informative characters. Derived state is shared by two but not all taxa- "shared derived character states."

3.4 **Light microscope** is called because it uses glass lenses to enlarge images of specimens through which visible light has been transmitted.

Electron microscope a microscope that has about 100 times the magnifying power of a light microscope because it forms images with electrons and magnetic lenses.

[4*4 = 16]

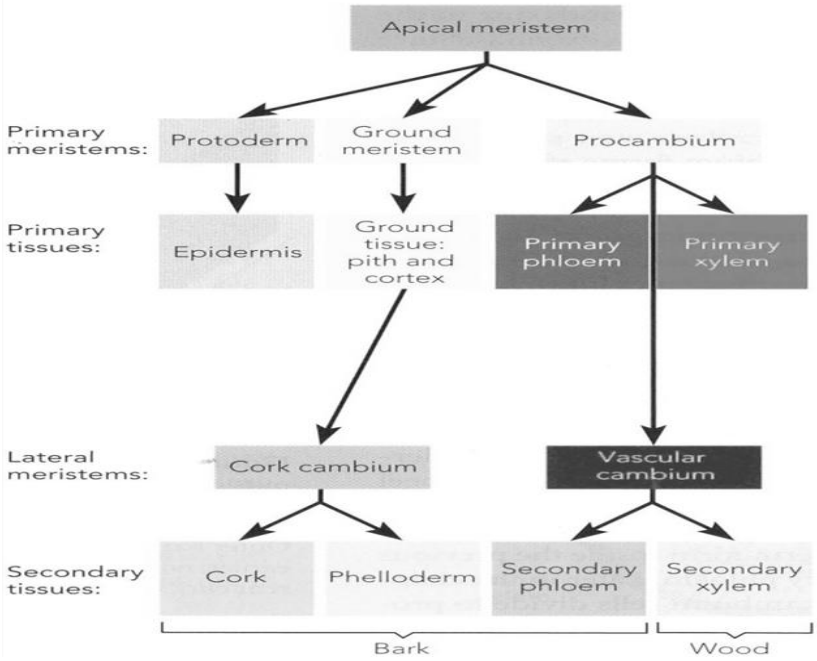
QUESTION 3

3.1 **NB: In order for the student to accumulate full mark in this question, there should be a supplementary of diagrams during and/or on each phase.**

	MEIOSIS I	MEIOSIS II
Prophase	After replication, Homologous chromosome pair up and are held together by chiasma. Rearrangement of genetic material occurs between non-sister chromatids (crossing over)	Chromosomes, each composed of two chromatids associated at centromere, move towards the metaphase plate.
Metaphase	Chromosomes are positioned on the metaphase plate as pairs of homologs, rather than individual chromosomes,	Chromosomes positions on the metaphase plate, because of the crossing over in Meiosis 1, the two sister chromatids of each chromosome are not genetically identical.
Anaphase	Homologs separate and sister chromatids remain attached at centromere.	Chromatids separate and move towards opposite ends as individuals.
Telphase	Each half of the cell has a complete haploid set of replicated chromosomes, each composed of two sister chromatids. One or both chromosomes include regions of non-sister chromatid DNA.	The end product from one parent cell is 4 daughter cells, each genetically distinct from the others and from the parent.

(20)

3.2



(10)

QUESTION 4

4.1

- Photosynthesis sustains all life on earth.
- Plants are our fundamental source of food.
- Many medicines come from plants.
- Wood from plants provides construction material for shelter.
- Woods also provides paper products.
- Wood is the main source of fuel for cooking and beating. **(10)**

4.2 Mycorrhizae are mutualistic associations between vascular plant roots and soil fungi. In endomycorrizae, the fungi penetrate plant roots and produce branching structure called arbuscules. In ectomycorrizae, the fungi do not penetrate plant roots but surround the roots to produce a sheath called mantle. The plant gains increased absorption of minerals, such as phosphorus, and consequently do not need to produce as many root hairs. The fungus may also help to protect the plant against attack by some disease-causing fungi and nematodes. The fungus on the other hand, gains sugar and other organic molecules from produced by the plant.

(5)

4.3

a) **Stolons**

- Horizontal stems or runners that run at or just below the soil surface and they grow above ground (*structure*) to help the plant to reproduce asexually (*function*).

b) **Tubers**

- Underground-enlarged fleshy stems (*structure*) that store starch (*function*).

c) **Bulbs**

- These are short stems with fleshy leaves attached on them (*structure*), and they store starch (*function*).

d) **Rhizomes**

- Underground horizontal with reduced scale like leaves (*structure*), and they produce new leaves and shoots (*function*).

e) **Corms**

- Underground food storage (*function*), and are shaped like bulbs but consist of stem tissue rather than thick leaves (*structure*).

(15)

*******The End*******