



POLYTECHNIC OF NAMIBIA
Department of Agriculture and Natural Resources Sciences

QUALIFICATION: Bachelor of Natural Resource Management (Nature Conservation)	
QUALIFICATION CODE: 07BNTC	LEVEL: NQF Level 5
COURSE: Nature Conservation Biology	COURSE CODE: NCB510S
DATE: 4 June 2015	SESSION: 13H00 – 16H00
DURATION: 3 Hours	MARKS: 150

FIRST OPPORTUNITY EXAMINATION QUESTION PAPER

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MODERATOR: Mrs. L. Theron

**THIS QUESTION PAPER CONSISTS OF 4 PAGES
(EXCLUDING THIS FRONT PAGE)**

INSTRUCTIONS

1. Answer ALL the questions.
2. Write clearly and neatly.
3. Number the answers clearly.

PERMISSIBLE MATERIALS

1. Examination paper.
2. Examination script.

SECTION A

QUESTION 1

- 1.1 Complete the following sentences by filling in the missing word(s). Write down only the letters **(a) – (j)** and the correct answers. (10)
- (a)..... classification, is done purely on the basis of appearance. (The old approach)
- (b)..... is the scientific study of the diversity of organisms and their evolutionary relationships.
- (c)..... is the science of describing, naming and classifying living organisms.
- (d)..... is the procedure of assigning names to the different kinds and taxa of living organisms.
- (e) (name of scientist) simplified scientific classification by developing the ... (f) ... (system) in which each species is assigned a unique ... (g) ... name.
- A ... (h) ... is a group of individuals which is naturally reproductively isolated from other such groups.
- Prokaryotes lack an organized ... (i) ... and other organelles and have cell walls containing ... (j)
- 1.2 Briefly describe the Principles of classification. (Also called the rules of binominal nomenclature.) (10)

[20]

QUESTION 2

Briefly describe the functions of the following:

- 2.1 Nucleus (1)
- 2.2 Ribosomes (1)
- 2.3 Golgi-complex (3)
- 2.4 Mitochondria (3)
- 2.5 Chloroplasts (2)

[10]

QUESTION 3

Explain why viruses cannot be classified as living organisms.

[10]

QUESTION 4

What are the differences between the following sets of terms, as they related to sexual reproduction?

[10]

- 4.1 Mitospores and meiospores
- 4.2 Isomorphic and heteromorphic
- 4.3 Zoospores and aplanospores
- 4.4 Isogametes and oogametes
- 4.5 Sporophyte and gametangium

SUB- TOTAL [50]

SECTION B

QUESTION 1

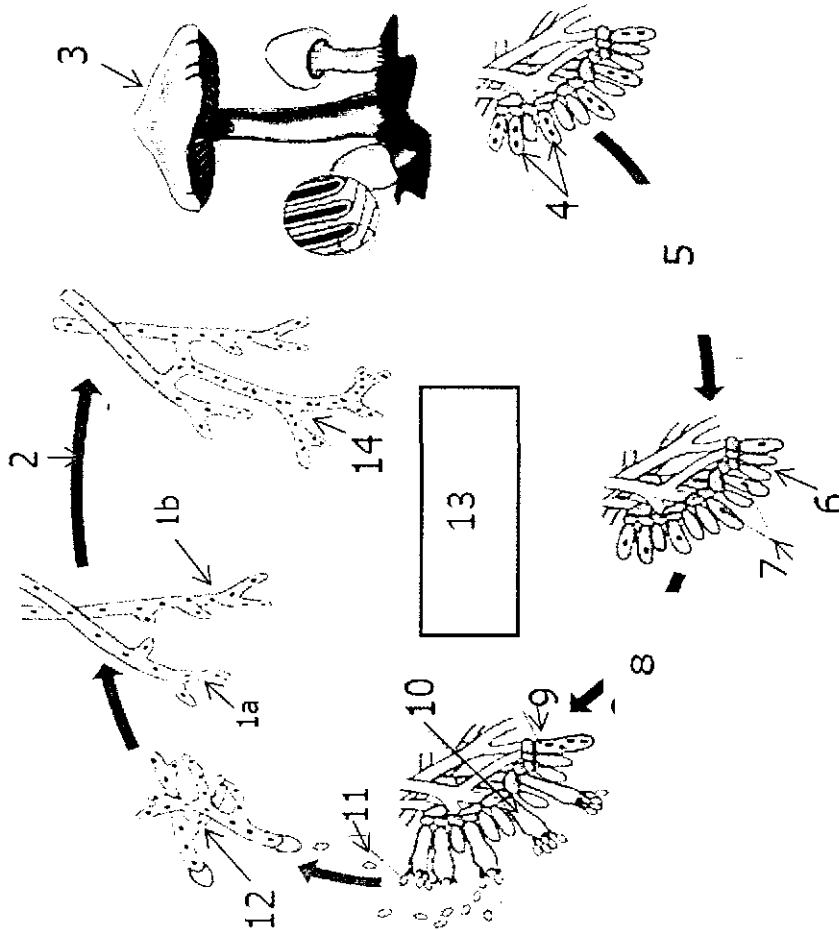
- 1.1 Define mitosis. (6)
- 1.2 Meiosis is similar to Mitosis yet different. Briefly discuss the differences. (10)
- [16]**

QUESTION 2

Compare the characteristics of the Kingdom Protocista with those of the Kingdom Plantae. (14)

QUESTION 3

Complete the life-cycle by filling in the missing labels. Do not re-draw the life-cycle, only write down **1-14** and provide the relevant information. (14)



QUESTION 4

Complete the table, comparing the different Mycota phyla. Do not re-draw the table, only write down the letters **A-1 to H-2** and provide the relevant information. [18]

PHYLUM	CHYTRIDIOMYCOTA	ZYGOMYCOTA	ASCOMYCOTA	BASIDIOMYCOTA	DEUTEROMYCOTA
Examples	Chytrids Primitive, aquatic, parasites and decomposers	Moulds Black bread mould e.g. <i>Rhizopus</i>	Sac fungi Yeasts e.g. <i>Saccharomyces</i> Powdery mildews, morels & truffles	Club fungi Mushrooms e.g. <i>Agaricus</i> Bracket fungi, & Puffballs	Imperfect fungi e.g. <i>Penicillium</i> & <i>Aspergillus</i>
Distinguishing Characteristic:	A-1 A-2	Reproduce sexually forming Zygospores in Sporangia	B-1 B-2	Reproduce sexually forming Basidiospores in Basidia on gills	C-1 C-2
Morphology: Hyphae type:	D-1 D-2 D-3	Mycelium extensive hyphae bearing aerial sporangia Hyphae coenocytic no septa, multinucleic	E-1 E-2 E-3	Extensive mycelium hidden in food source Basidiocarp fruiting body Septate perforated mono- and dikaryotic hyphae	Extensive, hidden mycelium, different shapes of branched conidiophores - varies
Energy	Heterotrophic - mainly Saprophytic	F-1 F-2	Heterotrophic - Saprophytic-yeast & Parasitic - ergot	Heterotrophic - Saprophytic - mushroom + Parasitic - rust + smut	Heterotrophic, Saprophytic e.g. on jam also parasitic pathogens
Locomotion	Motile gametes + zoospores with 1 flagellum	G-1 G-2	Sessile Spores blow in wind	Sessile Spores blow in wind	Sessile Spores blow in wind
Reproduction Asexual Sexual	H-1 H-2	(favourable conditions) Non-motile spores form in sporangium (unfavourable conditions) Zygospores formed in sporangia + and - hyphae types	Budding - Yeasts Conidia pinch off conidiophores Ascospores formed in asci Dikaryotic hyphae	Conidia, (uncommon) Basidiospores formed in Basidia on gills of fruiting body, Basidiocarp	Conidia No sexual reproduction

QUESTION 5

- 5.1 Name and explain Mendel's second law, using a suitable example. (3)
- 5.2 In Guinea pigs straight hair is recessive to curly hair, but a black coat colour is dominant over a white coat colour. **(Use the letter "B" for coat colour and the letter "T" for straight vs curly hair).**
If a pure black, straight-haired female is mated with a white, curly-haired (pure) male, what will be the genotype and phenotype of the F1 offspring? Also provide the genotypes of both parents. (4)
- 5.3 If two of the F1 offspring in question 5.2 mate, what is the chance that a straight-haired, white guinea pig will be produced in the F2 generation? First show the genotypes of both parents (F2 generation) and use a Punnett square to determine the phenotypes of the F2 generation. Then indicate the chance that a straight-haired, white guinea pig will be produced. (8)

[15]

QUESTION 6

- 6.1 Which pathway in the Calvin cycle is used by most plants? (1)
- 6.2 Why is the pathway mentioned in 6.1 called by that name? (1)
- 6.3 How many reactions are involved in the Calvin cycle? (1)
- 6.4 The reactions involved in the Calvin cycle take place in 3 main steps. Name those steps. (3)
- 6.5 Name the two sets of reactions in photosynthesis that take place in the chloroplast and also state where exactly in the chloroplast each set takes place. (4)
- 6.6 List the inputs needed as well as the end-products in the carbon fixation reactions. (5)
- [15]**

QUESTION 7

Explain how number of leaves; number of stomata and the presence of a thick cuticle respectively influence the rate of transpiration. **[8]**

SUB- TOTAL [100]

TOTAL [150]