CHARLES DARWIN UNIVERSITY

Family Name	
Given Names	
Student Number	
Teaching Period	Semester 1, 2017

FINAL EXAMINATION	**DURATION**
ENV102 – The Diversity of Life	Reading Time: **10** minutes Writing Time: **180** minutes

INSTRUCTIONS TO CANDIDATES

EXAM CONDITIONS

You may begin writing from the commencement of the examination session. The reading time indicated above is provided as a guide only.

This is a CLOSED BOOK examination

No calculators are permitted

No handwritten notes are permitted

No dictionaries are permitted

ADDITIONAL AUTHORISED MATERIALS	**EXAMINATION MATERIALS TO BE SUPPLIED**
No additional printed material is permitted	1 x 8 Page Book 1 x 16 Page Book 1 x 4-Multiple Choice Answer Sheet

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Section B

Short Answer Questions

Total number of marks for this section: 90

This section should be answered on the Answer Booklet provided.
Please ensure that your name and student number have been written on the Answer sheet and place in the completed answer Booklet.

There are 20 questions and each question is 4.5 marks.
Suggested time allocation for Section B: 90 mins

Question 46

Which of the six kingdoms of life are eukaryotes and which are prokaryotes?

(Marks: 4.5)

Question 47

Name three organelles that are present in a eukaryote cell.

(Marks: 4.5)

Question 48

Correctly write the Latin binomial name of the following organism.

Family: myrtaceae

Species: rubra

Subgenus: oxilia

Genus: pultia

Phylum: magnoliophyta

(Marks: 4.5)

Question 49

According to the biological species definition, how would we determine if two populations of plants of similar appearance were two separate species or not?

(Marks: 4.5)

Question 50

Explain the difference between primary and secondary cell growth. Which would occur in a herbaceous daisy?

(Marks: 4.5)

Question 51

What are two locations where the production of new cells mainly occurs in an herbaceous plant such as a parsley plant?

How does a tree vary from a parsley plant in respect to the locations where the production of new cells occurs?

(Marks: 4.5)

Question 52

What environmental factors need to be present for a seed to germinate? What is seed dormancy?

(Marks: 4.5)

Question 53

Give two reasons why flowering plants can more effectively and efficiently carry out sexual reproduction than mosses or ferns?

(Marks: 4.5)

Question 54

Briefly describe how the water vascular system of invertebrates functions.

(Marks: 4.5)

Question 55

Briefly describe the life-cycle of a sheep liver fluke.

(Marks: 4.5)

Question 56

List and describe **TWO** (2) classes of animals in the Phylum Platyhelminthes.

(Marks: 4.5)

Question 57

List **TWO** (2) ways in which animals in the Phylum Cnidaria differ from animals in the Phylum Arthropoda.

(Marks: 4.5)

Question 58

List, and briefly describe, **TWO** (2) invertebrate groups in which many species filter feed.

(Marks: 4.5)

Question 59

Describe indirect and direct development in vertebrates and two different reproductive strategies associated with each type of development.

(Marks: 4.5)

Question 60

Discuss briefly the various adaptations that reduce water loss in Australian frogs.

(Marks: 4.5)

Question 61

Describe the difference between ectotherms and endotherms. Name an animal that is an example of an ectotherm and name an animal that is an endotherm.

(Marks: 4.5)

Question 62

List the four (4) main subgroups of reptiles and the features that separate living reptiles from other terrestrial vertebrates.

(Marks: 4.5)

Question 63

What are two characteristics of K-strategist species? Name an example of an r-strategist and a K-strategist species.

(Marks: 4.5)

Question 64

Explain the difference between density dependent mortality and density independent mortality. Give an example of each.

(Marks: 4.5)

Question 65

Give an example explaining how niche separation enables many species of snakes to co-exist at Fogg Dam.

(Marks: 4.5)

Section C

Short Essay Questions

Total number of marks for this section: 45

This section should be answered on the Answer Booklet provided.
Please ensure that your name and student number have been written on the Answer sheet and place in the completed answer Booklet.

There are 5 questions and each question is 9 marks.
Suggested time allocation for Section C: 45 mins

Question 66

EITHER

Compare and contrast the alternation of generation and zygotic meiosis lifecycles.

Note in your answer which generations are haploid, diploid, single celled or multicellular and where meiosis and fertilisation occur. Answer the question using labelled diagrams if you wish.

Also answer the following questions.

- Which of these life cycle types could describe the lifecycle of a moss?
- Which of these lifecycle types could describe the lifecycle of a Protista?
- Which of these life cycle types could describe the lifecycle of a tree?

OR

Define evolution, speciation and biodiversity.

Describe the process of natural selection.

How does natural selection affect evolution when (1) the environment is stable for a long time and (2) the environment is changing?

(Marks: 9)

Question 67

EITHER

Describe the light and dark reactions of photosynthesis in plants.

How does water stress directly limit the reactions of photosynthesis?

In one or two sentences how else does water stress more generally limits plant growth?

OR

Compare the lifecycles of a moss (Bryophyta), fern (Filicophyta) and flowering plant (Magnoliophyta) and for each of the above phyla answer the following questions.

- Is the gametophyte or the sporophyte larger?
- Which are dispersed as seeds and which are dispersed as spores?
- When fully developed are the gametophyte, sporophyte or both, free living in the environment?
- Which have vascular tissue?

Explain for mosses (Bryophyta), ferns (Filicophyta) and flowering plants (Magnoliophyta) how the sporophyte is initially dependent on the gametophyte? For your answer you can just sketch a diagram for each phylum if you like.

(Marks: 9)

Question 68

EITHER

Describe how animals in the three classes of the Phylum Mollusca feed.

OR

Describe how a stinging cell (nematocyst) in animals in the Phylum Cnidaria operates.

(Marks: 9)

Question 69

EITHER

What features are unique and characteristic of mammals? Name the three main groups of mammals and explain how you would identify a representative of each.

OR

Describe the various anatomical adaptations of birds that enable them to fly.

(Marks: 9)

Question 70

EITHER

Consider the dusky plains rats at Fogg Dam. Define the relevant population, community and ecosystem.

Would the dusky plains rats be more r-selected or K-selected than the water pythons and why?

Give an example of a community interaction involving the dusky plains rats.

Give an example of a property of the ecosystem which is not a property of the community.

OR

Draw a foodweb using the floodplain case studies (wild rice, dusky plains rat, water python, eagle, magpie goose and add in decomposer organisms), and identify the tropic relationships among them.

On your drawing identify where:

- solar energy is captured into the web,
- inorganic nutrients enter the web,
- energy is lost from the web, and
- the trophic level of each species.

(Marks: 9)