

**RHODES UNIVERSITY
DEPARTMENT OF ENVIRONMENTAL SCIENCE
EXAMINATION: JANUARY 2015
ENVIRONMENTAL SCIENCE 202
PAPER 2 (AEGROTAT)**

Internal examiners: Prof Sheona Shackleton

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External examiner: Dr P. O'Farrell

MARKS: 100

DURATION: 3 HOURS

GENERAL INSTRUCTIONS TO CANDIDATES

1. This paper consists of **TWO** sections.
 2. Answer each section in a **SEPARATE** answer book.
 3. There are **SIX** questions. Answer **ALL** questions.
 4. Time management is very important. The value of the mark for each question should be used as a rough guide to the amount of time allocated to answer the question.
 5. It is in the candidate's interest to write legibly.
 6. The Oxford concise English dictionary may be used in this exam.
 7. At the end of the examination, place all answer books inside the book used to answer **SECTION A**.
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PLEASE DO NOT TURN OVER THIS PAGE UNTIL TOLD TO DO SO.

SECTION A: CLIMATE CHANGE (50 marks)

Question A1: Answer BOTH of the following questions for 5 marks each

- (a) Provide 2 examples of evidence that demonstrates the earth is warming. You may use illustrations/figures your answer.
- (b) Explain why 'business as usual' in relation to GHG emitting activities spells disaster for the future.

Question A1 Total = 10 marks

Question A2: Answer ONE of the following questions for 10 marks

- (a) Explain the various ways in which climate change is likely to affect agro-ecological systems in Africa.

OR

- (b) Discuss the direct and indirect ways in which climate change is predicted to impact human well-being and health.

Question A2 Total = 10 marks

Question A3: Answer ONE of the following questions for 30 marks (note that your answer should be at least 3 pages long)

- (a) Adaptation to climate change is a necessity. Explain this statement, outlining what adaptation is, how we can adapt, and why adaptation may be difficult in the African context.

OR

- (b) Describe the international policy response to climate change and where South Africa sits in relation to this. What do you think the main challenges are in SA regarding the implementation of climate change policy and strategies?

Question A3 Total = 30 marks

SECTION B: BIODIVERSITY LOSS (50 marks)

Question B1: Answer BOTH of the following questions for 5 marks each

- (a) Name five of the twenty Aichi Biodiversity targets.
- (b) Biodiversity comprises composition, structure and function. Name the three levels at which biodiversity composition is most commonly considered. For each, give one example of how one might measure biodiversity at an appropriate spatial scale.

Question B1 Total = 10 marks

Question B2: Answer the following question for 10 marks

In South Africa, stewardship programmes, usually administered at a provincial level, comprises four different categories. What are these, and how are they different from each other in terms of the conservation goals they are set out to achieve, their management, ownership and their legislative security? In your answer you should include a brief definition of what the Stewardship programme is.

Question B2 Total = 10 marks

Question B3: Answer ONE of the following questions for 30 marks

- (a) Drawing on what you learned in the field and in class, discuss some of the benefits and difficulties of using the natural capital and ecosystem service approach as a strategy to combat biodiversity loss. In your answer you should explain what the ecosystem service approach is, and the kinds of biodiversity loss that may be averted, or not, using this approach. You should make mention of the difficulties in measuring ecosystem services and relating this to biodiversity loss, and the reasons why investigators and governments may take an ecosystem service or natural capital approach. Wherever possible, give examples to back up your statements.

OR

- (b) Discuss how different drivers of biodiversity loss may affect the resilience of social-ecological systems. In your answer you should refer to systems at different scales (i.e. global to local) and discuss both the direct and indirect consequences of biodiversity loss for both social and ecological elements of these systems. You may use examples to back up your statements.

Question B3 Total = 30 marks

END OF EXAMINATION PAPER