

**RHODES UNIVERSITY**

**EXAMINATION: JUNE 2012**

**ENVIRONMENTAL SCIENCE HONOURS**

**ECOLOGICAL MODELLING**

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**Internal Examiners:** Dr James Gambiza

**Marks:** 100

**Duration:** 3 hours

**External examiner:** Dr Patrick O'Farrell

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**INSTRUCTIONS**

1. This paper has three section (A, B, C)
2. Answer every Section, noting the choice within sections
3. Number all answers correctly
4. Answer each Section in a **SEPARATE** answer book
5. Note that this paper has **THREE** pages

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**PLEASE DO NOT TURN OVER THIS PAGE UNTIL TOLD TO DO SO**

**SECTION A (30 marks)**

**Please answer any THREE of the following question**

**Question A1** (10 marks)

Justify the need for modelling.

**Question A2** (10 marks)

Describe the initiation of systems dynamics modeling.

**Question A3** (10 marks)

What are the characteristics of stocks and flows?

**Question A4** (10 marks)

Outline the characteristics of a good systems dynamics model.

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**SECTION B (40 marks)**

**Please answer TWO of the following questions**

**Question B1 (20 marks)**

Explain the commonly observed time paths in dynamic systems. Use diagrams to illustrate your answer.

**Question B2 (20 marks)**

What are the generic templates that are commonly used in system dynamics modeling? Use diagrams to illustrate your answer.

**Question B3 (20 marks)**

Briefly explain the key steps in designing a systems dynamics model.

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**SECTION C (30 marks): Compulsory**

**Question C1 (30 marks)**

Using named examples, evaluate the use of mental models in addressing environmental problems.

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**END OF EXAMINATION PAPER**