

**UNIVERSITY OF SWAZILAND**  
**MAY FINAL EXAMINATION 2014/2015**

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**TITLE OF PAPER** : Special Topics in Environmental Chemistry

**COURSE NUMBER** : C615/ERM645

**TIME** : Three Hours

**INSTRUCTIONS** : Answer any **Two** Questions from **Section A** and any **Two Questions** from **section B**. Each Question carries 25 marks.

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**This Paper Contains (4) Printed Pages**

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## SECTION A : ENVIRONMENTAL TOXICOLOGY

### Question 1 [25]

Describe the mechanistic ways in which toxicants enter and interact with cells.

[25]

### Question 2 [25]

Discuss the factors which affect the distribution of toxic substances in tissues.

[25]

### Question 3 [25]

(a) Explain the following terms in relation to environmental toxicology.

[9]

- (i) Toxin
- (ii) Toxicity
- (iii) Venon

(b) Briefly discuss the four distinct types of toxicity that characterize the duration and location of the poisonous state.

[16]

## **SECTION B: ENVIRONMENTAL LAW**

### **Question 4 [25]**

- (a) Define "Environmental Law" [2]
- (b) In relation to the Air Pollution Control Regulations of 2010,
- (i) Which international convention has led to the development of these regulations. [2]
  - (ii) Explain how pulp mills have adopted emission controls to comply with this legislation. [3]
- (c) In relation to the Ozone Regulations of 2003,
- (i) Discuss the international convention that led to development of these regulations. [3]
  - (ii) List two Ozone Depleting Substances (ODS) that are being phased out in Swaziland and enforced by law. [2]
  - (iii) List two (2) alternative substitutes currently being used in the refrigeration industry to replace ODS. [2]
  - (iv) Describe any three principal ways in which the phasing out of ODS is enforced in Swaziland. [3]
- (d) In 2010, Swaziland ratified the Kyoto Protocol.
- (i) What are the aims and objectives of this Protocol? [4]
  - (ii) What legal reforms are required in Swaziland in order to operationalize the Kyoto Protocol? [4]

### **Question 5 [25]**

- (a) The supreme law in Swaziland is the Swaziland Constitution Act, 2005. Under this law, what are the functions of each of the three arms of government. [3]
- (b) The Environmental Management Act, of 2002 empowers the Minister of Environment and Tourism to make regulations under the Act. Describe the processes that the Swaziland Environment Authority followed in the gazetting of the Water Pollution Control Regulations of 2010. [4]
- (c) The control of hazardous substances that cross international borders is governed by the Basel Convention. Outline the principles of the Basel Convention and its practical and financial implications on the usage of hazardous waste disposal facilities by Swaziland in South Africa. [4]
- (d) The paper industry in Swaziland uses co-disposal of sludge waste with boiler ash as "best practice" rather than ship these wastes to South Africa.
- (i) What is meant by co-disposal". [2]
  - (ii) What is meant by "best practice", and in the case of disposal of sludge in Swaziland, why would these industries adopt this approach? [3]
  - (iii) Describe a Class 3 facility as described by the Landfill Disposal Regulations 2013 of South Africa. [4]
  - (iv) Describe the legal threshold limits of the National Environmental Management Act, 1996 of South Africa as applicable to non-putrescible waste disposal in a Class 3 landfill [5]

**Question 6 [25]**

- (a) What is meant by a “Protection Order”, and how admissible is it in a Court of Law? [2]
- (b) In relation to the Waste Regulations 2000,
- (i) Discuss its principal aims [3]
  - (ii) Upon conviction under the law, what are the sentences imposed on offenders [2]
- (c) In relation to the Litter Regulations 2011,
- (i) Discuss its principal aims [3]
  - (ii) Upon conviction under the law, what are the sentences imposed on offenders [2]
- (d) Discuss the Inco Maputo Agreement on Shared Watercourses, on the abstraction of water from rivers in Swaziland [4]
- (e) Swaziland became a party to the Ramsar Convention in 2013. What are the country’s obligations under this convention? [4]
- (f) Legislation that protects soils against pollution in Swaziland currently does not exist, but soil pollution control is a requirement of any development proposal in terms of the Swaziland Environment Authority (SEA’s) Environmental Audit and Assessment and Review Regulations (EAARR) of 2000. Describe the steps that a “Proponent” of a proposed mining development is legally obliged to follow to apply with the EAARR of 2000. [5]