University of South Australia

If you are required to use a calculator, please note the make and model here:
Calculator Make:
Calculator Model:

2006 Mid Year Examination

Student ID Number	Student ID Number									

Family Name	
Given Names	

Division of - ITEE

School of - NBE

Course Name – Environmental Engineering

Subject Area **ENGG** **Catalogue Number 3002**

Examination Day **Saturday** **Examination Date 01/07/06**

Examination Time **9.00am** **Length of Exam 3 hrs**

Examination Venue:	Ridley Centre

Instructions to Candidates

1. **Time allocated; 3 hours.**
2. **Students will be allowed 15 minutes reading time before the examination commences.**
3. **Open book examination.**
4. **No special aids required.**
5. **Answer 5 questions only of the 7 in the paper.**
6. **Dictionaries are permitted.**

Conduct in examinations

- Students are responsible for finding out their examination times and locations and for travelling to the venue. Examination times and locations are published on the University web site and advertised on the student portal. It is recommended that students arrive at least 15 minutes prior to the advertised start time.
- Students who arrive up to 30 minutes after the published start time will be permitted to enter the examination room but will not be allowed any additional time to complete the examination.
- Students who arrive more than 30 minutes after the published start time will not be permitted to enter the examination room and will receive a zero mark for that assessment.
- All students must bring with them, and display on their desk:
- their student identification card: or
- an alternative form of photographic identification such as a passport or driver's license. If a student does not provide acceptable photographic identification the invigilator will compare the student's likeness with University records in order to verify the student's identity;

- Where applicable, students must also display on their desk:
    - an approved disability access plan; and/or
    - an ENTEXT Card (for students who are entitled to extra time but have not been issued with an indicator on their student identification card)
- Unless otherwise specified in the course information booklet or as an agreed provision under Section 3: Moderation and Variation, a student must not take into the examination room any item with the potential to provide them or another student with an advantage, including but not limited to:
    - text books or any other book including dictionaries
    - calculators
    - mobile telephones, personal digital assistants, messaging devices or any other electronic device
    - notes, or other written documents
    - devices or personal items
    - examination answer booklets, attendance slips or scrap paper
- Any items specified as being allowed in the course information booklet must not be enhanced or tampered with in any way that provides an additional advantage to the student or any other student.

Procedures during the examination

- Every student must complete the attendance slip provided.
- The examination starting time may include a designated reading time for students. During this reading time, students are not permitted to write in the examination booklets but may complete attendance slips, fill in details required on the front cover of examination booklets, and make notes on loose-leaf paper provided. An invigilator will announce when the reading time has elapsed, after which students may write in the examination booklet.
- No student will commence writing answers until authorised by an invigilator. All students must stop writing when instructed by an invigilator. At the end of the examination all students must remain seated until all examination booklets have been collected.
- During an examination students are not permitted to speak to or communicate with any other student, or give or receive any form of assistance, academic or otherwise.

Procedures for leaving the examination room

- Students are not permitted to leave the examination room in the first 30 minutes after the published starting time or during the last 10 minutes of any examination.
- After the first 30 minutes of the examination has lapsed, a student can request to leave the examination room for a short break. When approval is given by an invigilator, the student will be supervised during the period of absence.
- Students wishing to permanently leave the examination room must hand all examination booklets to the invigilator who will endorse the booklets as correctly identifying the student. Students cannot remove any examination answer booklets, scrap paper or attendance slips from the examination room.

Breaches of examination procedures

- A breach of the examination procedures may constitute academic misconduct. Procedures are deemed to be breached even if it cannot be demonstrated that the student gained an advantage from the breach. For example, if a student takes a mobile telephone or device into the examination room but does not switch it on or remove it from their pocket, it may still constitute academic misconduct although the intent is recognised in determining an appropriate outcome.
- Breaches of the examination procedures will be recorded under Section 9: Academic Integrity of this manual whether they constitute academic misconduct or not.

Procedures for breaches that cause disruption to an examination

- Any student disrupting the examination can be instantly dismissed from the examination room at the discretion of the chief invigilator. Where dismissal is the appropriate course of action, the chief invigilator will document the incident and provide a report to the Head of School or Director: Regional Engagement or nominee.
- The Head of School or Director: Regional Engagement or nominee will investigate the incident as either:
- academic misconduct by following the procedures for formal inquiry set out in Section 9: Academic Integrity, or
- misconduct under Statute 7: Student Misconduct.
- Where dismissal is not deemed appropriate by the chief invigilator, the student will be permitted to remain in the examination, and clause 6.6 will apply.

Procedures for breaches that do not cause disruption to an examination

- If a breach is detected that does not cause disruption to the examination, or is assessed by the chief invigilator as not warranting dismissal from the examination room, the invigilator will tell the student that the breach has been detected and will be reported.
- The invigilator will document the incident and will provide a copy of this report to the Academic Integrity Officer at the relevant school within 5 working days of the incident.
- If the Academic Integrity Officer considers that the breach constitutes academic misconduct, they will investigate the incident by following the procedures for managing alleged academic misconduct set out in Section 9: Academic Integrity.
- If the Academic Integrity Officer considers that the breach does not consider academic misconduct, they will provide academic counselling to the student.

Question 1 (lecturer - Rowena Morris) – 20 marks

1. What South Australian legislation will tell you what animals are endangered?
(1 mark)

2. What Commonwealth legislation defines the environment?
(1 mark)

3. Using a diagram explain the global water cycle.
(3 marks)

4. What is the difference between intermittent and perennial streams?
(2 marks)

5. Discuss how identical plants could be reproduced using existing plants from a proposed development site.
(3 marks)

6. Provide six examples of what can be measured to monitor the environment
(3 marks)

7. List six examples of social impacts that may occur during a construction project.
(3 marks)

8. Community consultation requires preparation before approaching the public. What would the preparation need to consider?
(4 marks)

Question 2 (Lecturer – Simon Beecham) – 20 marks

1 Define the term *catchment* in the context of water resource management.
(2 marks)

2 All catchments drain to a receiving water body, which has an assimilative capacity. Define *assimilative capacity* in this context. What types of water body are there and how do their assimilative capacities vary relative to each other, in general.
(4 marks)

3 For any catchment that you can think of, identify four ways in which human development in this catchment has changed the natural water body or bodies.
(4 marks)

4 Define any human change that has been beneficial to the body and its associated ecosystems.
(4 marks)

5 For this catchment:

- where can you obtain information on the landform and on any natural water bodies?

- where can information be found on the ecosystems associated with the water bodies in the catchment?

- where can you obtain information on way that human activities have altered the catchment?

(6 marks)

Question 3 (Lecturer - Solomon Buckman) – 20 marks

1. Briefly comment on the mining process and the potential impacts on the environment during:
   - *Exploration*
   - *Extraction*
   - *Processing*
   - *Transport*
   - *Final use*

(8 marks)

2. The key to successful minesite rehabilitation is planning prior to commencement of mining so as to prevent or significantly reduce impacts during and after the operation. Discuss the following three essential elements of successful rehabilitation giving examples where possible
   - *Rehabilitation objectives*
   - *Site description*
   - *Detailed site plan*

(6 marks)

3. Discuss the processes involved in the formation of acid rock drainage (ARD), the environmental impacts of ARD and potential remediation methods. Why is constant monitoring essential during remediation?

(6 marks)

Question 4 (Lecturer – Andrew Mins) – 20 marks

1. Describe the key components of an environmental management system.

(8 marks)

2. Select an industry that you are familiar with and answer the following questions in the context of that industry (mining or civil construction could be selected as industry sectors):

   (a) List the types of environmental impacts or risks that are commonly encountered within the selected industry sector

(b) Select two impacts or risks and describe how environmental management systems can be applied to control those impacts / risks

(12 marks)

Question 5 (Lecturer – Andrew Howes) – 20 marks

As a new engineer in a development firm, you have been asked to determine and document a *site history* for a given location in Port Adelaide in order to determine the potential for *site contamination.*

1. Describe 3 different approaches, techniques, tools or methodologies you might apply to establish the site history and potential for contamination at the site.

(6 marks)

2. You have been designated to manage all enquires about the final report given about the development site. A local media organisation has contacted you with regard to the following statement from your employer, requesting an explanation:

"Whilst the Port Adelaide site is somewhat polluted, it has been determined that it is not a contaminated site according to the regulations"

Explain why a polluted site is not necessarily a contaminated site

(6 marks)

3. More comprehensive site analysis has found a leaking tank that has severely polluted a section of the site – the area is now a *contaminated site*. Whilst *removal and disposal* is probably the most common site remediation technique used in Australia, your employer wants to show the community they are serious about environmental issues. *Identify* and *describe* another site remediation technique that can be applied, using a diagram where possible

   NOTE: You do not need to identify a contaminant, and you may assume that the contaminant in question, site conditions and budget are suited to the technique you describe.

(8 marks)

Question 6 (Lecturer - Michael Malavazos) – 20 marks

1 Briefly explain the main reason why company activities such as those undertaken by oil and gas exploration and production need to be regulated.

(6 marks)

2 Regulation can be classified into two categories, 1) carrot strategies and 2) stick strategies. Briefly explain the difference between such strategies.

(8 marks)

3 Briefly explain the importance (the learning you can get from) of having EIR project as part of Environmental engineering course

(6 marks)

Question 7 (Catchall) – 20 marks

This is a 'catchall' question with many parts. Please answer **only four questions** out of the six given. You are required to provide only short answers, which may be in dot point format.

1. Tailing Dam containment areas are short term storages & pose 3 areas of community concern, what are they & why?

2. Describe the effect of liquefaction on tailing storages and how is it likely to occur, what checks would warn of such an occurrence?

3. Site contamination is caused by what & what criteria must be established before such is designated?

4. What are the likely impacts on human & ecological health of site contamination?

5. Environmental Management systems operated by Newmont Mining & Adelaide Brighton Cement recognize their environmental risks; would you expect their risks to be widely different? Explain!

6. The EPA monitor air quality in Adelaide & regional industrial areas, describe the data collected from High Volume samplers? How do they measure odour contamination? What equipment is used to survey areas such as Pt. Pirie, Mt. Gambier & Birkenhead

(5 x 4 = 20 marks)