

THE UNIVERSITY OF MEOURNE

Semester 2 Assessment 2004
LFR – Advanced Diploma of Agriculture

**207170 – Applied Ecology In the Rural Environment
Final Examination**

Reading Time: 15 minutes
Writing Time: 120 minutes (2 hrs)

There are 5 pages

Authorised Materials:

A non programmable calculator can be used

Instructions to Invigilators:

Students will require at least 4 separate script books
The examination paper is to remain in the examination room.
Students can use non programmable calculators.

Instructions to Students:

Fill out details on the script book. If you need additional script books please raise your hand.
Label all script books used, Section 1, 2, 3, 4.
Read each question carefully and answer all parts of the question.

The exam is divided into 4 sections, each with 3 questions. You must answer 8 of the 12 questions. However you must answer at least one question from each section. The questions from each section must be written in a separate script book.

Each question is worth 15 marks. The paper is worth 120 marks (1 mark / minute)

SECTION 1

All answers from this section must be written in Script Book 1

You must answer at least one of the following

Question 1. Plants growing within a limited space can have three (3) different responses. Explain these different responses as one plant (A) replaces another plant (B). Draw three graphs to demonstrate the total yield responses- X axis - ratio of A to B; Y axis – Total yield of A & B. (9 marks)

(b) Which of the 3 responses types occurred within each pasture system you studied as part of the spatial assignment. (There may be different responses within each pasture systems). (6 marks)

Question 2. Explain the dynamics of the seedbank, including the major components the inputs and outputs of the seedbank and the regulatory processes within the seedbank. The use of a diagram may help in your explanation (15 marks)

Question 3. What is a biome and what are the major biomes found in Australia? (15 marks)

SECTION 2

All questions from this section must be written in Script Book 2

You must answer at least one of the following

Question 4. Answer the following:

- a) Explain how a GPS satellite navigation system works.
(5 Marks)
- b) One of the major problems with GPS is accuracy. What are three major sources of inaccuracy associated with GPS?
(3 Marks)
- c) How can GPS accuracy be improved by using two GPS receivers?
(3 Marks)
- d) Explain what a Geo-synchronous satellite orbit is and why it is useful for remote sensing purposes.
(4 Marks)

Question 5. One of the major reasons for using a GIS is to afford good decision support. This can be accomplished by overlaying different data sets. With the aid of appropriate diagrams describe the types of data a GIS can handle, illustrating some of the key advantages and disadvantages of each data type. As part of your analysis of these key data types and using appropriate real world examples, suggest how being able to overlay different data sets can assist decision makers.
(15 marks)

Question 6. Answer the following:

- a) One of the major problems with weather forecasting is being able to “see” the atmosphere. With this in mind explain how remote sensing concepts could be applied to allow meteorologists an opportunity to see the atmosphere in motion.
(7.5 Marks)
- b) What *remote sensing* options would be available to survey and assess the damage caused by a very large bush fire? (Note: Large means like the recent alpine fires that burned over 1 million ha of inaccessible forest)
(7.5 Marks)

SECTION 3

All questions from this section must be written in Script Book 3

You must answer at least one of the following

- Question 7.** What is the impact of disturbance on the food web of an ecosystem, such as a woodland in northern Victoria? What influence does the type of disturbance have on this impact?
(15 marks)
- Question 8.** Describe the meaning of the term “sustainable” as it applies to agriculture in Australia. Include in your answer an outline of the fundamental components that should typify sustainable agricultural practice.
(15 marks)
- Question 9.** What is the difference between ecological auditing, ecological monitoring and environmental management systems?
(15 marks)
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SECTION 4

All answers from this section must be written in Script Book 4

You must answer at least one of the following

- Question 10.** (a) Describe predator – prey cycles and how they can be used to manage populations. (10 Marks)
- (b) What factors regulate and control population size. (5 Marks)
- Question 11.** Describe the projected changes and discuss the potential impacts of global warming. (15 marks)
- Question 12.** Water quality is considered one of the highest priority environmental issues facing Australians. List 5 parameters that you would measure in a sample of water to assess water quality. Describe the effects each of these parameters has on the water and the organisms living in it. (15 Marks)

End of paper