



HIGHER SCHOOL CERTIFICATE EXAMINATION

2000

# AGRICULTURE

3 UNIT (ADDITIONAL)

*(32 Marks)*

*Time allowed—One hour and a quarter  
(Plus 5 minutes reading time)*

## **DIRECTIONS TO CANDIDATES**

- Answer each question in a SEPARATE Writing Booklet.
- You may ask for additional Writing Booklets if you need them.
- Board-approved calculators may be used.

## **Section I** (8 marks)

- The question in this Section is COMPULSORY.

## **Section II** (24 marks)

- Attempt TWO questions.
- All questions are of equal value.

**SECTION I****Marks**

(8 Marks)

The question in this Section is **COMPULSORY**.

Answer the question in a **SEPARATE** Writing Booklet.

**QUESTION 1**

Agricultural research has the potential to impact on agricultural production in many ways.

For an area of agricultural research you have studied:

- (a) describe how the industry involved has benefited from the findings of this research; **3**
- (b) discuss **ONE** problem or controversial issue that has arisen as a result of the findings of this research; **3**
- (c) outline important responsibilities of researchers that aim to address this type of problem or issue when conducting research programs. **2**

**SECTION II****Marks**

(24 Marks)

Attempt TWO questions.

Each question is worth 12 marks.

Answer each question in a SEPARATE Writing Booklet.

**QUESTION 2 Animal Breeding and Reproduction**

EITHER

- (a) For a breeding technique of your choice, answer the following questions.
- (i) Describe the role of TWO reproductive hormones in the named breeding technique. **4**
  - (ii) Explain why a knowledge of reproductive anatomy is important when using this breeding technique. **3**
  - (iii) For a livestock enterprise you have studied, explain how this breeding technique affects: **5**
    - 1 reproductive efficiency;
    - 2 product quality.

OR

- (b) The field of animal genetics impacts at both the farm level and in laboratory research.
- (i) Using examples, outline the role of objective measurement in farm breeding programs. **6**
  - (ii) Describe the process of genetic engineering at the cellular level. (You may use diagrams.) **6**

**QUESTION 3 Horticulture****Marks**

EITHER

- (a) (i) Using horticultural examples, explain the relationship between the level of output and the nature and level of inputs. **4**
- (ii) Present arguments for and against the use of a named input to horticultural systems. **4**
- (iii) For a named horticultural industry, evaluate a technological innovation aimed at improving quality. **4**

OR

- (b) An extensive knowledge of plant physiology is an essential requirement for a successful horticulturalist.
- (i) Explain, using examples, how plant physiology relates to techniques of plant propagation. **3**
- (ii) Using an example, demonstrate that horticulturalists need to develop a knowledge and understanding of organisms other than crop plants. **3**
- (iii) Outline **THREE** additional areas of knowledge that are necessary to manage a successful horticultural enterprise. **6**

**QUESTION 4 Alternative Agricultural Systems****Marks****EITHER**

- (a) Before a farmer decides to adopt an alternative enterprise, it is essential that the farmer is well informed.
- (i) Outline the types of information needed by the farmer to make an informed decision regarding adoption of an alternative enterprise. Suggest the possible sources of this information. **6**
  - (ii) For an alternative enterprise that you have studied, evaluate the existing and potential viability of the industry. **6**

**OR**

- (b) Innovative farmers often develop alternative agricultural systems from existing production systems.

For an alternative agricultural system developed from an existing system that you have studied:

- (i) outline the reasons why the innovations were necessary; **4**
- (ii) describe the steps taken by the farmer prior to adopting this innovation; **4**
- (iii) describe new marketing strategies associated with this innovation. **4**

**QUESTION 5 Technological Perspectives in Agriculture****Marks**

EITHER

- (a) For a named plant or animal production system you have studied, discuss how technological developments in information and communication have impacted on:
- (i) farm production; **6**
  - (ii) product marketing. **6**

OR

- (b) Computer use by farm managers has increased greatly in recent years.
- (i) Outline the diversity of computer applications in Australian agriculture. **4**
  - (ii) Explain the impact of increased computer usage on agricultural management. **4**
  - (iii) Evaluate ONE computer-based farm management program you have studied. **4**

**QUESTION 6 Pasture Production**

EITHER

- (a) There is an increasing interest in the use of native pasture species on Australian farms.
- (i) Using examples, outline reasons for this interest in native pastures. **4**
  - (ii) Outline some problems associated with the use of native pasture species. **4**
  - (iii) Evaluate the role of introduced pasture species in pasture management systems. **4**

OR

- (b) For a pasture production system you have studied:
- (i) outline the pasture establishment program; **4**
  - (ii) explain why it is desirable to have a mix of pasture species; **4**
  - (iii) describe the alternative pasture management strategies available to the farm manager to enable optimum animal productivity. **4**

**QUESTION 7 Coping with Climate****Marks**

EITHER

- (a) For a named agricultural enterprise you have studied:
- (i) outline how climate and weather influence the timing of operations within the production cycle for this enterprise; **4**
  - (ii) describe strategies that could be implemented to minimise effects on the enterprise if long-term weather forecasts predict low rainfall levels; **4**
  - (iii) evaluate ONE of the strategies described in part (a) (ii) in terms of economic and environmental considerations. **4**

OR

- (b) Climate is one of the most important environmental factors for farmers to manage.
- (i) Describe the methods used in collecting macro-climatic and micro-climatic data. **5**
  - (ii) Using examples, assess the financial and environmental effects of TWO climatic modification practices. **7**

**QUESTION 8 Agribusiness**

EITHER

- (a)
- (i) Using examples, describe the impact of changes in world and domestic markets on farm businesses. **4**
  - (ii) Outline the possible roles of farm advisory services in the producers' response to these changing markets. **4**
  - (iii) Describe methods that can be employed to develop new international markets. **4**

OR

- (b) Finance for farming is an important issue for farm survival and sustainability.
- (i) Describe techniques that are available to evaluate the financial situation of a farm. **4**
  - (ii) Describe the options available for a farm business to obtain finance for its operations. **4**
  - (iii) Explain strategies that could be used for a farm business to obtain finance for its operations. **4**

**Please turn over**

**QUESTION 9 Whole Farm Planning****Marks**

EITHER

‘Whole-farm planning generally has three interdependent segments dealing with physical, managerial and financial aspects.’

*Reproduced from Roberts, Brian, The quest for sustainable agriculture and land use with permission of UNSW Press*

- (a) Describe the process you used to develop a whole-farm plan, with reference to:
- (i) the physical and biological components of the farm; **4**
  - (ii) selection and management of farm enterprises; **4**
  - (iii) financial considerations. **4**

OR

- (b) Activities that enhance the quality of natural resources assist in achieving sustainability of agricultural systems.
- (i) Describe types of interactions a farm may have with its immediate ecosystem and rural community. **4**
  - (ii) Outline aspects of a whole-farm plan that promote sustainability of the farm. **4**
  - (iii) Assess the impact the whole-farm plan may have on the broader agricultural ecosystem. **4**

**End of paper**