

BOARD OF STUDIES  
NEW SOUTH WALES

HIGHER SCHOOL CERTIFICATE EXAMINATION

1999

# 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 is sometimes questioned on the basis of methodology, data analysis and ethics.

Discuss these issues, using specific examples to describe:

- |                              |          |
|------------------------------|----------|
| (a) appropriate methodology; | <b>3</b> |
| (b) valid data analysis;     | <b>3</b> |
| (c) ethical considerations.  | <b>2</b> |

**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) Assess the impact of modern technology on:

- (i) methods used to select breeding stock; **4**
- (ii) reproductive efficiency; **4**
- (iii) the gene pool of farm animals. **4**

OR

(b) Female reproductive systems of farm animals may be managed by farmers.

- (i) Using examples, explain ways in which hormones can be used to manipulate the function of the female reproductive systems of farm animals. **6**
- (ii) Discuss the ethical issues that may confront researchers and farmers when considering the commercial implementation of hormone treatments. **6**

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

EITHER

- (a) In the horticultural industry, local and overseas market standards and specifications may differ. These specifications have to be met before Australian horticulturists can successfully compete.
- (i) Discuss the implications of the above statement for the manager of a horticultural enterprise. **6**
  - (ii) Outline the essential practices that should be implemented to deliver the products, to ensure consumers receive the product in the desired condition. **6**

OR

- (b)
- (i) Using examples, explain management techniques that may be used to control diseases in horticulture. **8**
  - (ii) Analyse the factors managers must consider when attempting to balance economic viability and environmental sustainability. **4**

**QUESTION 4 Alternative Agricultural Systems**

EITHER

- (a) Some new enterprises in Australia have attracted large financial investments but have failed to yield appropriate returns.

For an alternative enterprise you have studied, describe:

- (i) investigations you would carry out before investing in such an enterprise; **6**
- (ii) specific knowledge and skills you would require to manage such an enterprise. **6**

OR

- (b) Innovation by farmers is often the key to success in existing agricultural enterprises.

For an existing agricultural enterprise you have studied:

- (i) describe ONE such successful innovation the farmer has implemented; **3**
- (ii) outline the steps the farmer took prior to developing this innovation; **4**
- (iii) discuss the factors that have made the innovation successful. **5**

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

EITHER

- (a) Technological developments in recent years have had a significant impact on agricultural production in Australia.

Assess the impact of each of the following developments on production systems you have studied:

- |                                  |          |
|----------------------------------|----------|
| (i) satellite monitoring;        | <b>3</b> |
| (ii) expert systems;             | <b>3</b> |
| (iii) post-harvest treatments;   | <b>3</b> |
| (iv) farm chemical applications. | <b>3</b> |

OR

- (b) Using examples, discuss the role of computer-based technology on modern Australian agriculture. In your discussion you should refer to:

- |   |          |
|---|----------|
| (i) farm planning and decision making;  | <b>4</b> |
| (ii) data analysis and farm management; | <b>4</b> |
| (iii) product marketing.                | <b>4</b> |

**QUESTION 6 Pasture Production****Marks**

EITHER

- (a) Long-term persistence is an important characteristic of successful pasture species.
- (i) Using specific examples, discuss features of pasture plants that ensure their long-term sustainability. **6**
  - (ii) Outline management practices farmers can use to encourage the long-term persistence of desirable pasture species. **6**

OR

- (b) Successful pasture management requires an appropriate pasture composition to suit a range of environments on the farm.
- (i) Using specific examples, discuss the advantages and disadvantages of native and introduced pasture species. **6**
  - (ii) Describe how environmental factors influence the distribution of pasture species. **6**

## QUESTION 7 Coping with Climate

Marks

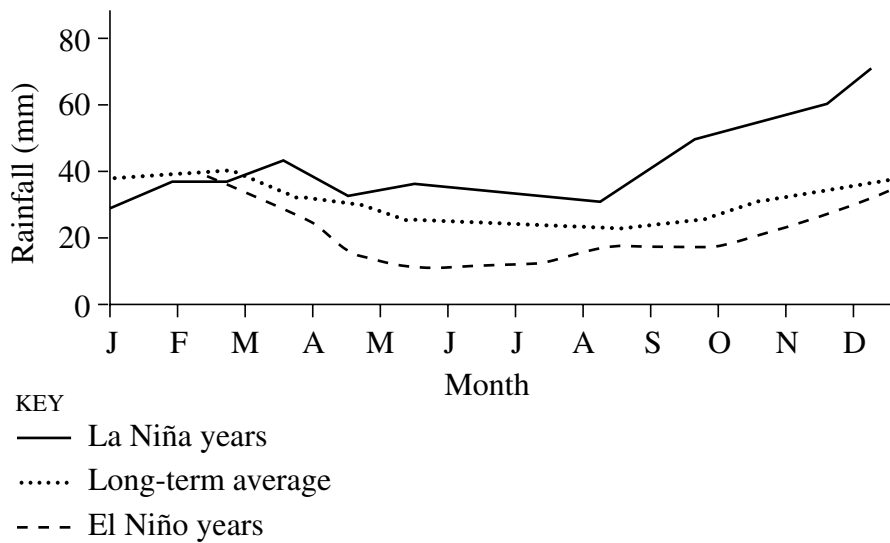


FIG. 1. Averaged monthly rainfall for the Bourke rainfall district, based on the El Niño episodes of 1918, 1940, 1957, 1965, 1972, 1976, 1982 and 1986, and La Niña episodes of 1916, 1938, 1950, 1955, 1970, 1973, 1975 and 1988.

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## EITHER

- (a) Figure 1 compares rainfall during El Niño and La Niña episodes to average rainfall.

A farmer receives information that an El Niño cycle is occurring.

- (i) Describe possible strategies available to the farmer. **6**
- (ii) Evaluate the effects of these strategies when incorporated into a farm management plan. **6**

## OR

- (b) The following questions relate to Figure 1 above.

- (i) Describe methods that may be used to collect climatic data. **4**
- (ii) Explain the possible effects of either El Niño or La Niña episodes on: **8**
- 1 the local economy;
  - 2 the national economy.

Please turn over

**QUESTION 8 Agribusiness****Marks**

EITHER

- (a) A farmer has to diversify to remain viable.
- (i) Using examples, discuss the practical and economic implications of diversification. **6**
  - (ii) Describe the information a farmer would require before seeking finance for a new venture. **6**

OR

- (b) Farm decision making can be influenced by a number of advisory services.
- Discuss the role of these services in:
- (i) farm management; **6**
  - (ii) marketing. **6**

**QUESTION 9 Whole-farm Planning**

EITHER

- (a) Whole-farm planning assists farmers to match their basic land resources with appropriate land usage. For a farm you have studied:
- (i) describe methods used to assess the land resource; **3**
  - (ii) discuss your findings about existing land use practices; **3**
  - (iii) explain why the farm-management plan you developed should lead to improved land usage. **6**

OR

- (b) A farm is part of a wider physical and social environment.
- Using examples, describe how:
- (i) actions at the farm level can affect the wider community; **6**
  - (ii) off-farm agencies, including all levels of government, can affect farm decisions related to whole-farm planning. **6**

**End of paper**