BOARD OF STUDIES
NEW SOUTH WALES

HIGHER SCHOOL CERTIFICATE EXAMINATION

1995

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

In agriculture, conflicting arguments may be resolved by carrying out research. Data can be collected that can support an argument rather than relying on opinion.

For an option you have studied:

(a) choose an issue and outline a number of perspectives associated with this debate; **3**

(b) choose ONE of these perspectives and argue a case in support of it. In your answer, include some research you found in studying this option. **5**

SECTION II

Marks

(24 Marks)

Attempt TWO questions.

All questions are of equal value.

Answer each question in a *separate* Writing Booklet.

QUESTION 2. Animal Breeding and Reproduction

EITHER

(a) In a recent test, about 20% of beef and dairy animals were found to have genes that carried undesirable traits. Using your knowledge of breeding systems and techniques:

(i) discuss how a problem such as this may have affected reproductive efficiency and product quality; **5**

(ii) suggest ways in which undesirable traits may be minimized; **4**

(iii) describe how the process of genetic engineering could be used to reduce the problem. **3**

OR

(b) Breeding techniques and reproductive management have changed considerably in many major animal-production systems.

(i) Discuss how a knowledge of hormonal systems and animal reproductive anatomy enables more-efficient breeding programs to be carried out. **6**

(ii) How have these new reproductive technologies enabled product specification and animal adaptability to be improved? In your answer, refer to an animal industry you have studied. **6**

QUESTION 3. Horticulture **Marks**

EITHER

(a) In a recent statement, a horticultural-industry leader suggested that the Australian horticultural industry has the potential to be a much larger export earner for this country.

(i) In the light of this statement, discuss the difficulties the industry faces in identifying new markets. **4**

(ii) Describe changes that are necessary in the types of products, production techniques, and post-harvest handling to allow expansion into any new markets. **8**

OR

(b) A detailed knowledge of plant physiology is essential in the development of a horticultural enterprise.

(i) Discuss how a knowledge of plant physiology enables effective plant propagation and reproduction to occur. **4**

(ii) Using examples, describe how the physiological and anatomical characteristics of plants affect their use in horticulture. **4**

(iii) Explain how differences in plant physiology affect the activities in a production cycle of a horticultural system. **4**

QUESTION 4. Alternative Agricultural Systems

EITHER

(a) Alternative agricultural systems often develop as a result of change and innovation to existing production systems.

For ONE alternative system that has developed in this way:

(i) explain why the new system developed; **6**

(ii) explain how agricultural research, management, and marketing have each affected the profitability and sustainability of the alternative agricultural system. **6**

OR

(b) New agricultural systems sometimes arise when new enterprises are developed.

For ONE new enterprise you have studied:

(i) discuss the ways in which market research and marketing techniques have contributed to the development of the new enterprise; **4**

(ii) explain how a knowledge of plant or animal biology has been used to develop the new enterprise; **6**

(iii) outline legal or institutional requirements that must be met to establish the new enterprise. **2**

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

EITHER

(a) Information and communication technologies are having a more significant impact on production and marketing in agriculture. Evaluate the importance of this change in improving the productivity of agricultural systems. In making the evaluation you should:

(i) describe the range of computer applications involved in production and marketing; **4**

(ii) assess the role of ONE particular computer farm-management program in improving productivity; **4**

(iii) evaluate the use of computers in the marketing of ONE plant or animal product. **4**

OR

(b) Technological developments in agriculture have functions that include replacing labour and improving production monitoring.

Discuss the impact of technology in these two areas by referring to:

(i) farm-chemical usage; **4**

(ii) post-harvest treatments; **4**

(iii) mechanization of planting and harvesting. **4**

QUESTION 6. Pasture Production

EITHER

(a) Pasture improvement requires that pastures be able to be evaluated in relation to needs that have been identified in the farm system.

(i) Describe the characteristics of plants that make them suitable for grazing. **4**

(ii) Evaluate the roles of introduced and native pasture species when deciding on the needs of a farm system. Illustrate your answer with examples and situations from your experience. **8**

OR

(b) Describe the establishment and management of pastures in rehabilitating degraded land. Illustrate your answer with examples. **12**

QUESTION 7. Coping with Climate **Marks**

EITHER

(a) Drought is a cyclical problem of Australian agriculture.

(i) Describe the impact that major droughts have on: **5**

- the local economy;
- the national economy;
- international markets.

(ii) Evaluate long-term and short-term strategies that a farm manager could use to reduce the impact of a drought on farm income and the environment. **7**

OR

(b) Rural industries need the best information on climate in order to maintain profitable and sustainable agricultural systems.

(i) Outline the types of climate and weather information and technologies that are now available to the rural industry. **3**

(ii) Describe the use of climate and weather forecasts by farm managers to improve the timing of management practices. **4**

(iii) Evaluate the techniques used by farmers to modify the effects of climate on production. **5**

QUESTION 8. Agribusiness

EITHER

(a) (i) For a farm product, evaluate alternative selling-systems for both the local and international market. **6**

(ii) Discuss how adding value to the product, either on or off the farm, creates new markets or increases marketability. **6**

OR

(b) (i) For a farm with which you are familiar, describe methods for analysing its financial situation. **4**

(ii) Describe the choices available to obtain finance for the farm's operation. **4**

(iii) Explain the strategies that could be used to obtain finance for the farm's operation. **4**

QUESTION 9. Whole-Farm Planning **Marks**

EITHER

(a) You have been employed as a consultant by the farm manager to develop a whole-farm plan for the farm in Figure 1.

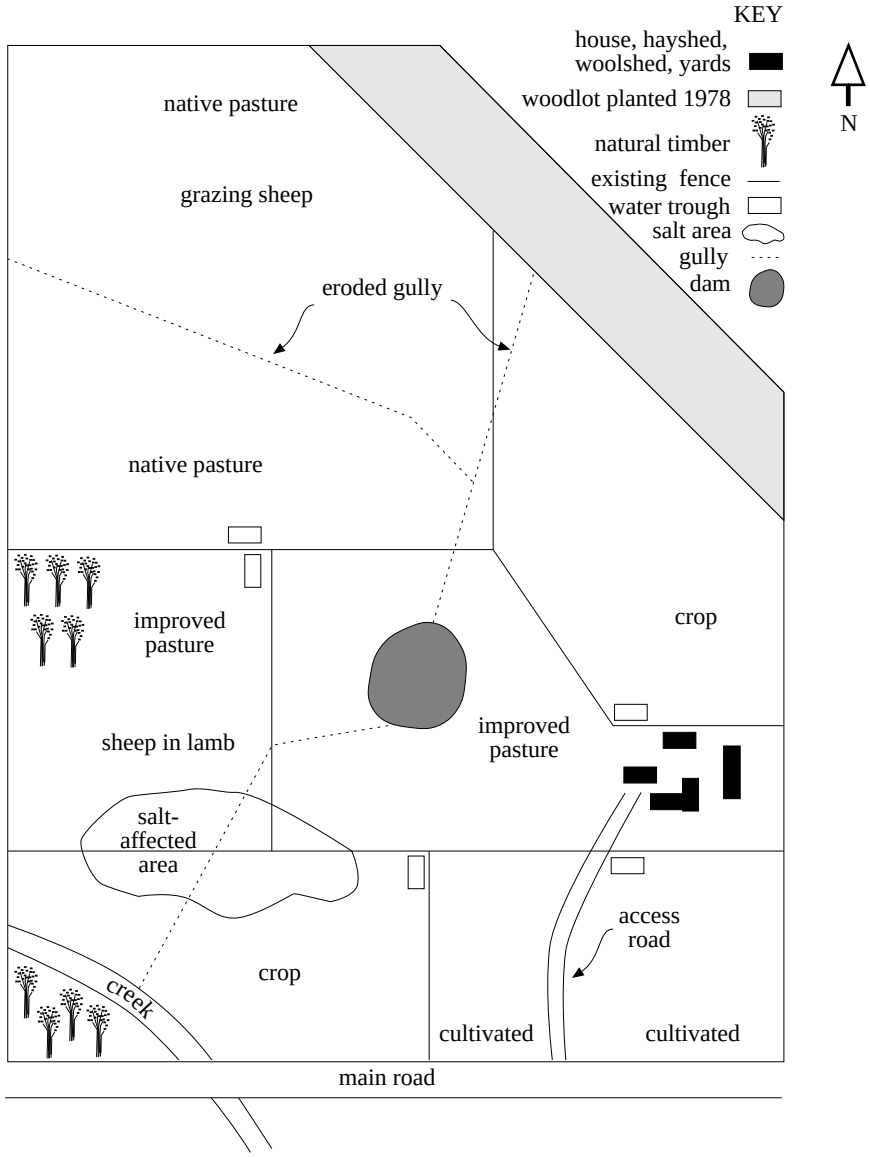

FIG. 1. FARM MAP.

(i) Outline possible interactions of the farm with its surrounding ecosystem and rural community. **4**

(ii) Comment on the contributions that off-farm agencies could make to the whole-farm plan. **3**

(iii) From Figure 1, develop a whole-farm plan that could improve sustainability of the farm. (Use a sketch with explanation.) **5**

OR

Question 9 continues on page 8

QUESTION 9. (Continued) **Marks**

(b) 'The thought of drought may be unpleasant, but property-management planning which recognizes the inherent limitations of the Australian environment can maintain productivity and profitability, while reducing the impact of drought.'

Agriculture Today, March 1995

The sustainability of a farm is affected by its physical environment, financial factors and social factors.

(i) Describe the role of property planning and financial planning in improving the sustainability of a farm. **4**

(ii) Explain how environmental, financial, and social factors can affect the implementation of any whole-farm plan. **4**

(iii) Describe how the inevitability of drought should affect elements of any whole-farm plan. **4**