



AGRICULTURE

2014
Trial Higher School
Certificate Examination

MULTIPLE CHOICE QUESTION BOOKLET

General Instructions

- Working time – 30 min
- Write using black or blue pen
- Board approved calculators may be used

Section I Pages 2–10

Part A – 20 marks

- Attempt Questions 1–20
- Allow about 30 minutes for this part

Section I

Part A – 20 marks

Attempt Questions 1–20

Allow about 30 minutes for this part

Use the multiple-choice answer sheet for Questions 1–20.

- 1 Which three organs perform similar functions in farm animals?
- (A) Proventriculus, stomach, omasum.
 - (B) Gizzard, crop, abomasum.
 - (C) Stomach, proventriculus, abomasum.
 - (D) Reticulum, proventriculus, abomasum
- 2 Use the following information to answer question 2 and 3.
An experiment was conducted to investigate the effects of micro-nutrients on the production of pasture. Six paddocks were selected. Each paddock was divided into five sections. The fertilizer “Micromix” was applied at the rate of 0, 10, 50, 100 and 250 g/ha.
- What are the TWO features of good experimental design that are evident in this trial?
- (A) Control and Replication
 - (B) Standardisation and Randomisation
 - (C) Control and standardisation
 - (D) Replication and standardisation
- 3 What needs to be done before making a recommendation to the farmer about the best rate of micro- nutrient application?
- (A) Repeat the experiment with different type of pasture at different sites
 - (B) Calculate standard deviation and standard error to establish if there is significant difference.
 - (C) Apply fertiliser together with irrigation so it can be absorbed properly.
 - (D) Make a visual inspection of the pasture to make the right recommendation.

- 4 An extract from the financial records kept on a wheat farm is shown below.

Income	Amount in \$
150 tonne of Wheat sold at \$250/t	37, 500
Costs	
Seed	600
Fertiliser	1,800
Fuel	8,000
Council Rates	900
Harvesting expenses	2,000
Bank loan repayments	6,000

What is the gross margin for the enterprise using the figures given in the table above?

- (A) \$16,400
 - (B) \$19,100
 - (C) \$25,100
 - (D) \$18,200
- 5 Which of the following is the best experimental design to test the effect of temperature on photosynthetic rate?
- (A) Growing one plant of variety A in a glasshouse and comparing growth with one plant of variety B grown outside.
 - (B) Growing ten plants of variety A in a glasshouse and comparing them with ten plants of variety B grown outside.
 - (C) Growing one plant of variety A in a glasshouse and comparing it with one plant of variety A grown outside.
 - (D) Growing ten plants of variety A in a glasshouse and comparing them with ten plants of variety A grown outside.

- 6 Farmers experience a range of financial pressures. Which strategy below is not an example of risk management?
- (A) Use of contracts
 - (B) High expenditure on inputs
 - (C) Taking out insurance policies
 - (D) Diversification of enterprises
- 7 Which method would be most effective if the government decided to improve animal welfare standards?
- (A) Write letters to all farmers urging them to be kind and caring
 - (B) Issue animal welfare brochures and flyers in some local shows
 - (C) Word of mouth
 - (D) Legislate changes to improve animal welfare
- 8 What is ONE disadvantage associated with artificial insemination in livestock breeding?
- (A) It may reduce the range of male genotype available to farmers.
 - (B) It may lead to an increase in the incidence of sexually transmitted diseases
 - (C) It may lead to an increase in inbreeding.
 - (D) It may increase the number of offspring sired by genetically superior animals.

9 Which statement describes objective measurements.

- (A) Given by people, each deciding their personal grading score, according to personal taste and perception.
- (B) Made with an objective in mind so the focus is not lost
- (C) Performed with a piece of equipment or measuring device so that the measurement is consistent.
- (D) Visual assessment by the one person consistently.

10 The table below shows the weights of four different groups of steers.

	<i>Group A</i>	<i>Group B</i>	<i>Group C</i>	<i>Group D</i>
Mean (kg)	230	260	272	228
Standard Deviation	1.60	2.16	1.64	1.72
Range of Weights (kg)	200-260	230-280	260-290	210-250

Which group of steers had the least variable weights?

- (A) A
- (B) B
- (C) C
- (D) D

11 Which criterion is not suitable for assessing beef quality ?

- (A) Fat colour
- (B) Meat colour
- (C) Marbling
- (D) Live weight

12 If a farmer wished to synchronise the oestrus in his cows what is the best hormone to use?

- (A) Prostaglandin
- (B) Oestrogen
- (C) Testosterone
- (D) combination of Testosterone and Progesterone

13 What is the role of *Rhizobium* bacteria found in root nodules on legume plants?

- (A) They provide energy for root growth.
- (B) They provide resistance to plant pathogens
- (C) They assist in absorbing water and plant nutrients
- (D) They provide an available source of nitrogen to the plant

14. A dairy research scientist noticed that one of the pure bred Jersey cows in the research program was producing large quantities of milk and did not get infected with mastitis. The research scientist decided to mate that specific cow to a pure bred Angus bull.

The research scientist is using what kind of breeding system?

- (A) Cross breeding
- (B) Line breeding
- (C) Pure breeding
- (D) Random breeding

15. Net Assimilation Rate (NAR) in plants will

- (A) decrease as the difference between photosynthetic rate and respiration rate becomes greater.
- (B) increase as the difference between photosynthetic rate and respiration rate becomes greater.
- (C) decrease if photosynthetic rate increases and respiration stays rate the same.
- (D) is only affected by photosynthetic rate and is unaffected by respiration rate.

16. The diagram shows how the total energy in a diet is used by an animal.

What is metabolisable energy a combination of ?

- (A) W and X
- (B) Y and Z.
- (C) W, X and Y
- (D) X, Y and Z

17. What is a common commercial use of the plant hormone ethylene?

- (A) To ripen fruit for market
- (B) To thin fruit in orchards
- (C) To defoliate a cotton crop
- (D) To promote root growth in cuttings

18. Predatory mites may be used to assist in the control of red spider mite. What type of pest control is this?

- (A) Biological
- (B) Chemical
- (C) Cultural
- (D) Genetic

19. An orchard trial tested the effects of different application rates of a new chemical to control the fruit fly damage to peaches. At the end of the trial the yield of unaffected fruit was recorded. The following results were obtained.

Treatment	Application rate	Yield per tree (kg)
A	20 ml / L	8
B	0 ml / L	2
C	35 ml / L	7
D	5 ml / L	3
E	10 ml / L	10

The results show that:

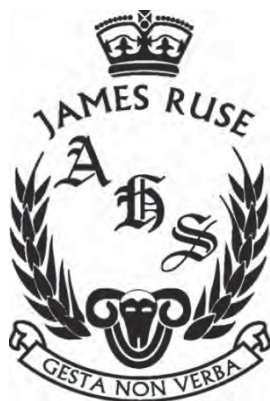
- (A) Highest rate of chemical application resulted in the best yield.
- (B) The application of chemical actually made no difference.
- (C) Lowest rate of chemical application resulted in the best yield.
- (D) 10 ml of chemical in one litre of water gave the best result.

20. Read carefully through the following insecticide label

<p>POISON</p> <p>NOT TO BE TAKEN</p> <p>KEEP OUT OF REACH OF CHILDREN</p> <p>READ SAFETY DIRECTIONS BEFORE OPENING</p> <p>Helothion EC Insecticide Spray</p> <p>For control of tomato grub and leafminer in tomatoes and capsicums only. Heliothis caterpillars in tobacco and Heliothis caterpillars in cotton only.</p>	<p>General Instructions Mixing:Add the required quantity of Helothion EC to water in the spray unit while stirring. Resistance note:The effectiveness of this product may be reduced or nullified as a result of pests developing a tolerance or resistance to the product. This product should not be used where the user suspects that a tolerant or resistant strain is present. Compatibility Helothion EC is compatible with most commonly used fungicides on tomatoes, capsicums and tobacco. Protection of Livestock Dangerous to bees. Do NOT spray any plants in flower while bees are foraging. Protection of Wildlife, Fish, Crustacean and Environment Do NOT contaminate ponds, waterways and drains with the chemical or used container. Storage and Disposal Store in the closed, original container in a well ventilated area, as cool as possible. Puncture top, bottom and sides of empty container, then crush and bury in an approved landfill. Safety Directions Product and spray are poisonous if absorbed by skin contact, inhaled or swallowed. When opening the container, preparing spray and using the prepared spray, wear cotton overalls buttoned to the neck and wrist and a washable hat, elbow-length PVC gloves and face shield. First Aid If poisoning occurs, contact a doctor or Poisons Information Centre. If swallowed, induce vomiting preferably using Ipecac Syrup and give one atropine tablet every 15 minutes. Get to a doctor or hospital quickly.</p>
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Choose the *incorrect* statement from those below:

- (A) When spraying the insecticide the farmer should wear overalls, a hat, gloves and a face shield.
- (B) On some farms, the targeted pests have been developing resistance to this insecticide.
- (C) The insecticide will kill Heliothis in tobacco, cotton and all vegetable crops.
- (D) This insecticide is toxic or poisonous to bees, wildlife, fish and crustaceans.



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Student Number

Agriculture

2014

**Trial Higher School Certificate
Examination**

ANSWER BOOKLET

Total marks - 100

General Instructions

- Reading time – 5 minutes
- Working time – 3 hours
- Write using black or blue pen
Black pen is preferred
- Draw diagrams using pencil
- Board approved calculators may
be used
- Write your Student Number at
the top of the page.

Section I Pages 2–12

80 marks

This section has two parts, Part A and Part B

Part A – 20 marks

- Attempt Questions 1–20 in the answer booklet
- Allow about 30 minutes for this part

Part B – 60 marks

- Attempt Questions 21–27
- Allow about 1 hour and 45 minutes for this part

Section II Pages 13–15

20 marks

- Attempt ONE question from Questions 29–31
- Allow about 45 minutes for this section

Section I

Part A – 20 marks

Attempt Questions 1 – 20

Allow about 30 minutes for this part.

Use the multiple choice answer sheet.

Select the alternative A, B, C or D that best answers the question. Fill in the response oval completely

Sample: $2+4 =$. (A) 2 (B) 6 (C) 8 (D) 9

(A) (B) (C) (D)

If you think you have made a mistake, put a cross through the incorrect answer and fill in the new answer.

(A) (B) (C) (D)

If you change your mind and have crossed out what you consider to be the correct answer then indicate the correct answer by writing the word correct and drawing an arrow as follows.

(A) (B) (C) (D)

Correct
↙

AGRICULTURE

STUDENT NUMBER _____

Section I

Mark _____ / 20

Part A – 20 marks

Multiple Choice Answer Sheet. Write your student number at the top of this page

Select the alternative A, B, C or D that best answers the question.

Shade in the response circle completely.

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|-----|---|---|---|---|---|---|---|---|
| 1. | A | O | B | O | C | O | D | O |
| 2. | A | O | B | O | C | O | D | O |
| 3. | A | O | B | O | C | O | D | O |
| 4. | A | O | B | O | C | O | D | O |
| 5. | A | O | B | O | C | O | D | O |
| 6. | A | O | B | O | C | O | D | O |
| 7. | A | O | B | O | C | O | D | O |
| 8. | A | O | B | O | C | O | D | O |
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| 10. | A | O | B | O | C | O | D | O |
| 11. | A | O | B | O | C | O | D | O |
| 12. | A | O | B | O | C | O | D | O |
| 13. | A | O | B | O | C | O | D | O |
| 14. | A | O | B | O | C | O | D | O |
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| 16. | A | O | B | O | C | O | D | O |
| 17. | A | O | B | O | C | O | D | O |
| 18. | A | O | B | O | C | O | D | O |
| 19. | A | O | B | O | C | O | D | O |
| 20. | A | O | B | O | C | O | D | O |

Section I (continued)

Part B – 60 marks

Attempt Questions 21–27

Allow about 1 hour and 45 minutes for this part

Answer the questions in the spaces provided. These spaces provide guidance for the expected length of response.

Question 21 (9 marks)

Name ONE farm product you have studied.

Name of farm product:

(a) Construct in the space below a flow chart of the steps involved in processing the raw agricultural commodity into various forms. **2**

(b) Describe ONE technology and its impact on production of beef cattle. **4**

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Question 21 continues on page 5

(c) Outline the importance of ongoing research in the beef industry. 3

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End of Question 21

Question 22 (8 marks)

An agricultural researcher conducted field trials to determine the effect of the previous crop on wheat yield in different crop rotations. The treatments compared were:

- Wheat following bare fallow (control)
- Wheat following lupins
- Wheat following canola
- Wheat following wheat

Each treatment was replicated four times.

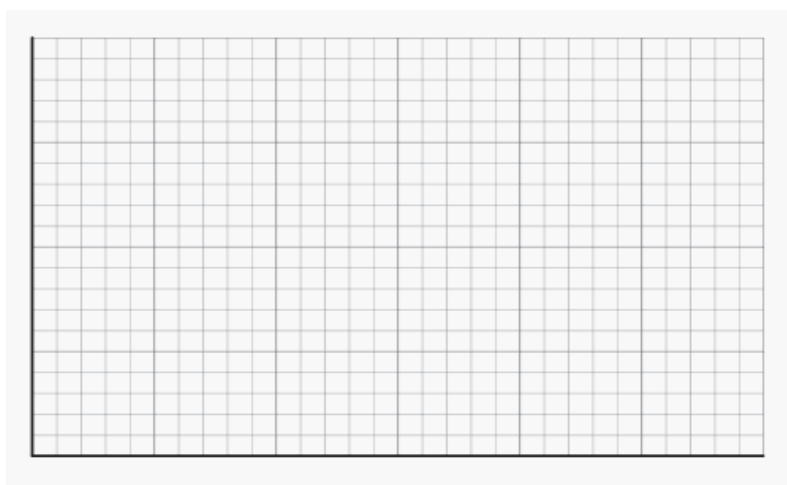
The results of the experiment are shown in the table below.

Treatment	Wheat Yield (tonnes/ha)				Mean
	Replications				
	1	2	3	4	
Following bare fallow (control)	2.8	3.1	2.9	3.2	
Following Lupins	3.7	3.2	3.3	3.6	
Following Canola	3.1	2.9	3.3	2.7	
Following Wheat	2.4	2.7	2.8	2.3	

(a) Calculate the mean for each of the treatments in the table above. **2**

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(b) Using the grid, construct a graph showing the average yield for each of the treatments. **4**



c) Outline the role of the control and replication in the experiment described above. **2**

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End of Question 22

Question 24 (10 marks)

A farmer may diversify by establishing sheep and poultry enterprises on their farm, however, the feed required for sheep and poultry is very different.

- a) Outline why the dietary requirements of sheep and poultry are different. **2**

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- b) Identify ONE hormone and outline how it regulates reproduction and behaviour in a named farm animal. **4**

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- c) Discuss the implications for a farmer of animal welfare legislation for a named farm animal. **4**

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End of Question 24

Question 26 (11 marks)

a) Outline a plant breeding system and how it is used to improve crop production.

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b) Explain how crop yield is affected by plant competition.

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c) Describe strategies a farmer could implement to reduce the effects of plant competition.

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Question 27 (6 marks)

Name a plant pest or disease and discuss an Integrated Pest Management (IPM) program for its control. **6**

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End of Question 27

Agriculture

Section II

20 marks

Attempt ONE question from Questions 28 – 30

Allow about 45 minutes for this section

Answer the question on the paper provided.

Extra writing paper is available

In your answer you will be assessed on how well you:

- demonstrate knowledge and understanding relevant to the question
 - communicate ideas and information using relevant examples
 - present logical and cohesive response
-

Question 28 ---- Agri-food, Fibre and Fuel Technologies (20 marks)

- (a) (i) Name a research study relating to biotechnology and identify the reason for undertaking the research. **2**
- (ii) Outline the findings of the research study named in part (a) (i), and explain how the findings can be used in Australian agricultural production. **6**
- (b) Discuss the use of genetically modified crops in agricultural systems. **12**

OR

Please turn over

In your answer you will be assessed on how well you:

- demonstrate knowledge and understanding relevant to the question
 - communicate ideas and information using relevant examples
 - present logical and cohesive response
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Question 29 ---- Climate Challenge (20 marks)

Answer part (a) of the question in a writing booklet.

- (a) (i) Name a research study relating to climate variability or its management, and identify the reason for undertaking the research. **2**
- (ii) Outline the findings of the research study named in part (a) (i), and explain how the findings can be used in Australian agricultural production. **6**
- (b) Discuss management strategies that a farmer could use to maintain production if Australia's climate becomes hotter and drier. **12**

OR

Please turn over

In your answer you will be assessed on how well you:

- demonstrate knowledge and understanding relevant to the question
 - communicate ideas and information using relevant examples
 - present logical and cohesive response
-

Question 30 ---- Farming in the 21st Century (20 marks)

- (a) (i) Propose a reason why a newly developed technology may not be widely adopted? 2
- (ii) Discuss the issues related to plant breeders' rights. 6
- (b) Evaluate the impact of ONE technological development in terms of:
economic
environmental
and legal factors 12

END OF PAPER