



Western Australian Certificate of Education Examination, 2012

Question/Answer Booklet

ANIMAL PRODUCTION SYSTEMS

Stage 3

Please place your student identification label in this box

Student Number: In figures

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In words

Time allowed for this paper

Reading time before commencing work: ten minutes

Working time for paper: three hours

Materials required/recommended for this paper

To be provided by the supervisor

This Question/Answer Booklet

Multiple-choice Answer Sheet

Number of additional
answer booklets used
(if applicable):

To be provided by the candidate

Standard items: pens (blue/black preferred), pencils (including coloured), sharpener, correction tape/fluid, eraser, ruler, highlighters

Special items: non-programmable calculators approved for use in the WACE examinations

Important note to candidates

No other items may be taken into the examination room. It is **your** responsibility to ensure that you do not have any unauthorised notes or other items of a non-personal nature in the examination room. If you have any unauthorised material with you, hand it to the supervisor **before** reading any further.

Structure of this paper

Section	Number of questions available	Number of questions to be answered	Suggested working time (minutes)	Marks available	Percentage of total exam
Section One: Multiple-choice	15	15	20	15	15
Section Two: Short answer	7	7	90	83	50
Section Three: Production practices	1	1	30	30	15
Section Four: Extended answer	3	2	40	40	20
				Total	100

Instructions to candidates

- The rules for the conduct of Western Australian external examinations are detailed in the *Year 12 Information Handbook 2012*. Sitting this examination implies that you agree to abide by these rules.
- Answer the questions according to the following instructions.

Section One: Answer all questions on the separate Multiple-choice Answer Sheet provided. For each question, shade the box to indicate your answer. Use only a blue or black pen to shade the boxes. If you make a mistake, place a cross through that square, then shade your new answer. Do not erase or use correction fluid/tape. Marks will not be deducted for incorrect answers. No marks will be given if more than one answer is completed for any question.

Sections Two, Three and Four: Write your answers in this Question/Answer Booklet.
- You must be careful to confine your responses to the specific questions asked and to follow any instructions that are specific to a particular question.
- Spare pages are included at the end of this booklet. They can be used for planning your responses and/or as additional space if required to continue an answer.
 - Planning: If you use the spare pages for planning, indicate this clearly at the top of the page.
 - Continuing an answer: If you need to use the space to continue an answer, indicate in the original answer space where the answer is continued, i.e. give the page number. Fill in the number of the question(s) that you are continuing to answer at the top of the page.

See next page

Section One: Multiple-choice**15% (15 Marks)**

This section has **15** questions. Answer **all** questions on the separate Multiple-choice Answer Sheet provided.

For each question, shade the box to indicate your answer. Use only a blue or black pen to shade the boxes. If you make a mistake, place a cross through that square then shade your new answer. Do not erase or use correction fluid/tape. Marks will not be deducted for incorrect answers. No marks will be given if more than one answer is completed for any question.

Suggested working time: 20 minutes.

1. A natural ecosystem has the capacity to recycle minerals and
 - (a) supply all organisms with energy.
 - (b) store excess energy.
 - (c) recycle energy.
 - (d) generate excess energy.

2. Which of the following is an example of a negative feedback loop?
 - (a) secretion of oxytocin
 - (b) protein digestion in the stomach
 - (c) body temperature regulation
 - (d) blood clotting

3. Biodiversity
 - (a) is a measure of the health of an ecosystem.
 - (b) is directly affected by climate.
 - (c) is most diverse in wheatbelt ecosystems.
 - (d) has not been influenced greatly by humans.

4. When feeding livestock by-products, producers must notify their use on
 - (a) the National Livestock Identification System.
 - (b) the National Vendor Declaration.
 - (c) Livestock Waybill.
 - (d) National Animal Health Statement.

5. Insect Growth Regulators (IGRs) are commonly used parasite treatments that are applied as a
 - (a) vaccine.
 - (b) drench.
 - (c) supplement.
 - (d) backline.

See next page

6. Worm resistance to drenches is most commonly caused by
- (a) overdrenching.
 - (b) underdrenching.
 - (c) new worm species.
 - (d) environmental variation.
7. Which of the following terms describes how individuals of the same breed have their ancestry recorded?
- (a) phenotype
 - (b) genotype
 - (c) pedigree
 - (d) heritability
8. Risk mitigation can **best** be described as a process to
- (a) reduce the impact of a risk when it occurs.
 - (b) eliminate the risk of an event.
 - (c) reduce the likelihood of a risk occurring.
 - (d) prioritise and spread a risk.
9. When planning for sustainability in a livestock enterprise, an important initial step is to assess the
- (a) current stocking rate.
 - (b) seasonal feed production.
 - (c) land capability.
 - (d) running costs.
10. Which of the following statements about an hypothesis is true?
- (a) It must state a known fact.
 - (b) It must be free from bias.
 - (c) It needs a variable.
 - (d) It must be testable.
11. During ruminant digestion, volatile fatty acids are produced from which food group?
- (a) carbohydrates
 - (b) fats
 - (c) proteins
 - (d) vitamins

12. When antibodies pass from the body of the mother into her unborn young, the process is called
- (a) naturally active.
 - (b) naturally passive.
 - (c) artificially active.
 - (d) artificially passive.
13. Which of the following statements is true for fat content in a carcass?
- (a) Any fat is undesirable and is heavily discounted.
 - (b) Minimal fat improves meat flavour.
 - (c) Fat helps to stop the carcass from drying out.
 - (d) Fat is a valuable by-product in the slaughter process.
14. The animals of which of the following industries have limited genetic diversity?
- (a) Sheep industry
 - (b) Poultry meat industry
 - (c) Beef industry
 - (d) Dairy industry
15. Which principles **best** fit the standardised techniques of experimental design?
- (a) replication, control and variation
 - (b) randomisation, variation and bias
 - (c) randomisation, bias and control
 - (d) replication, randomisation and control

End of Section One

See next page

Section Two: Short Answer

50% (83 Marks)

This section has **seven (7)** questions. Answer **all** questions. Write your answers in the spaces provided.

Spare pages are included at the end of this booklet. They can be used for planning your responses and/or as additional space if required to continue an answer.

- Planning: If you use the spare pages for planning, indicate this clearly at the top of the page.
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Suggested working time: 90 minutes.

Question 16

(10 marks)

The immune system is an animal's defence mechanism against disease.

- (a) List **one** disease that can be prevented by a vaccine and **one** disease that cannot be prevented by a vaccine. (2 marks)

Disease that can be prevented by a vaccine: _____

Disease that cannot be prevented by a vaccine: _____

- (b) What is the difference between an antigen and an antibody? (2 marks)

- (c) How is an artificial antibody correctly administered to an animal? (2 marks)

See next page

(d) Describe **two** ways in which an animal can gain active immunity. (4 marks)

Question 17

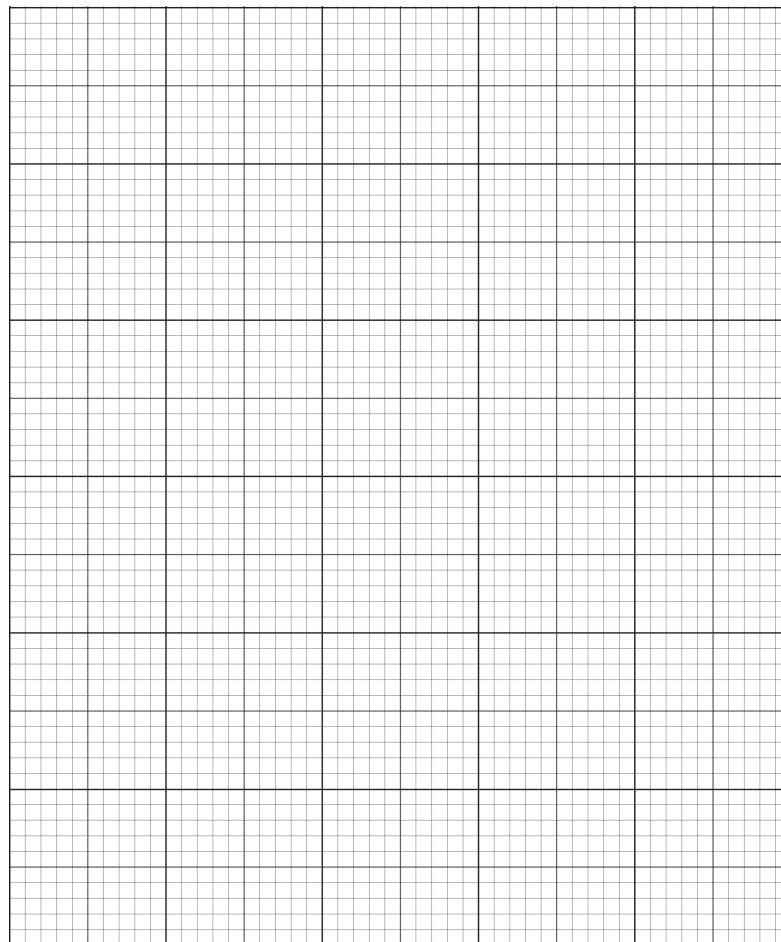
(10 marks)

- (a) A trial measuring the percentage of Non Protein Nitrogen (NPN) in a feed given to calves was conducted. At the end of the trial, the following results were collected.

Percentage NPN in ration	Mean live weight gain (kg) over 20 weeks	Standard deviation
0	40	0.2
1	45	1.8
2	49	1.5
3	41	1.2
4	32	0.3

On the grid below, draw a graph of the mean live weight gain in calves over 20 weeks on the rations in the table above. (5 marks)

If you wish to have a second attempt at this graph, the grid is repeated on page 39 of this Question/Answer Booklet. Indicate clearly on this page if you have used the second grid and cancel the working on the grid on this page.



See next page

- (b) Define standard deviation and state how it can be used to validate the data in the table in Part (a). (2 marks)

- (c) What conclusion can you draw from the data that would assist in planning a calf ration that included NPN? (3 marks)

Question 18

(11 marks)

Globally, Australian farmers have an important role in providing food and fibre.

- (a) (i) Define comparative advantage, using an Australian example. (3 marks)

- (ii) Describe how that advantage can be maintained by Australian producers. (2 marks)

- (b) Using a relevant example, describe **one** way in which quarantine is used as a protection strategy for Australian markets. (3 marks)

- (c) Identify and describe an element of a livestock production system that has changed in response to trends in consumer demand. (3 marks)

Question 19

(12 marks)

Heritability and estimated breeding values (EBVs) are useful tools when selecting for productivity.

- (a) Using an example from the table below, explain how heritability affects genetic gain. (2 marks)

Heritability estimates of production characteristics for Merino sheep

Characteristic	Estimate
Greasy fleece weight	0.30
Clean fleece weight	0.35
Body weight	0.40
Wrinkle score	0.40
Fibre diameter	0.55
Staple length	0.45

Question 20

(12 marks)

The gross margin of an enterprise is a useful farm management tool.

- (a) Explain the difference between a cash budget and a gross margin. (2 marks)

- (b) Below are the budgeted incomes and costs for two enterprises on the same farm. Calculate the shaded boxes. (5 marks)

	Grass fed enterprise			Feedlot enterprise		
Income	50 Steers	\$400/ head	\$20,000	50 Steers	\$680/ head	\$ _____
Variable costs	Tags	\$2/head	\$ _____	Tags	\$2/head	\$ _____
	Drench	\$5/head	\$ _____	Drench	\$5/head	\$ _____
	Vaccine	\$4/head	\$ _____	Vaccine	\$4/head	\$ _____
	Cartage	\$4/head	\$ _____	Cartage	\$4/head	\$ _____
	Feed concentrate	Nil	\$ _____	Feed concentrate	\$290/ head	\$ _____
	Sale commission (5% of sale price)	\$20/head	\$ _____	Sale commission (5% of sale price)	\$34/head	\$ _____
Total variable costs			\$ _____			\$ _____
Gross margin			\$ _____			\$ _____

- (d) If the manufacturer of the product in Part (a) were to carry out field tests of the product, what additional design aspect would be required to make the results more reliable?

(2 marks)

(ii) Farm biosecurity: _____ (3 marks)

(iii) NVDs: _____ (3 marks)

End of Section Two

See next page

Section Three: Production practices

15% (30 Marks)

This section contains **one (1)** question. You must answer this question. Write your answer in the space provided.

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Suggested working time: 30 minutes.

Question 23**(30 marks)**

The productivity of a farm enterprise relies on a sound knowledge of the production cycle and the ability to respond to problems, so that any loss of production is minimised.

Name an animal production enterprise you have studied and state its marketable product.

Animal production enterprise: _____ (no marks)

Marketable product: _____ (no marks)

Using specific examples from that enterprise, answer the following questions.

- (a) List **four** critical stages in the production cycle of your selected enterprise that need to be managed well. (4 marks)

One: _____

Two: _____

Three: _____

Four: _____

- (c) Describe how the use of a technology can help to optimise productivity at one of the stages you have listed in Part (a) on page 22. (3 marks)

- (d) For the marketable product nominated at the beginning of the question, identify a quality assurance process that is applicable and list **two** farm practices that support it. (3 marks)

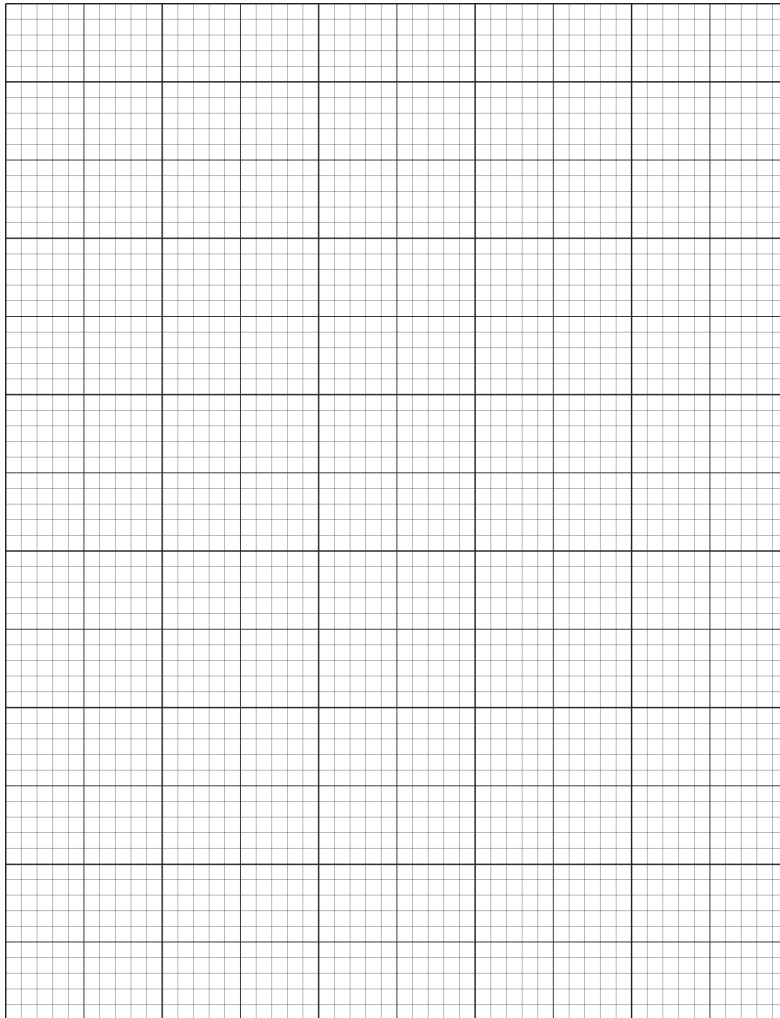
(e) Consider the following scenario for your selected enterprise.

Livestock are in good condition but your stored feed is running out. A lack of rain has doubled the price of feed. Even if it does rain soon, it will be a short season, with poor pasture growth.

Discuss **two** strategies you would put in place to reduce your costs and preserve your livestock enterprise for the next twelve months. (6 marks)

Strategy one: _____

Strategy two: _____



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