



Western Australian Certificate of Education Examination, 2013

Question/Answer Booklet

ANIMAL PRODUCTION SYSTEMS Stage 3	Please place your student identification label in this box
Student Number: In figures	
In words	
Time allowed for this paper Reading time before commencing work:	ten minutes

three hours

Materials required/recommended for this paper

To be provided by the supervisor

This Question/Answer Booklet Multiple-choice Answer Sheet

Working time for paper:

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 fluid/tape, 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 exam
Section One: Multiple-choice	15	15	20	15	15
Section Two: Short answer	8	8	90	111	50
Section Three: Production practices	1	1	30	28	15
Section Four: Extended answer	3	2	40	40	20
				Total	100

Instructions to candidates

- 1. The rules for the conduct of Western Australian external examinations are detailed in the Year 12 Information Handbook 2013. Sitting this examination implies that you agree to abide by these rules.
- 2. 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.

- 3. 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.
- 4. 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 that you are continuing to answer at the top of the 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. Rumen micro-organisms break down food proteins into peptides and
 - (a) propionic acids.
 - (b) amino acids.
 - (c) butyric acids.
 - (d) acetic acids.
- 2. On which document must you declare that your livestock have **not** been fed restrictive feeds prior to them leaving your property?
 - (a) Livestock waybill
 - (b) National Livestock Information System (NLIS) transfer
 - (c) National Vendor Declaration (NVD)
 - (d) National Sheep Health Statement
- 3. The mode of action of a pesticide refers to
 - (a) the way it is applied.
 - (b) its non-selective nature.
 - (c) how it kills or inactivates a pest.
 - (d) a plan to avoid resistance.
- 4. Artificial insemination can be very successful, but there may be issues with
 - (a) careless hygiene, spreading disease between females.
 - (b) females being overdosed with artificial hormones.
 - (c) a lack of superior sires to choose from.
 - (d) maintaining the integrity of the frozen semen container.
- 5. When a characteristic has a high heritability, it is mostly influenced by
 - (a) phenotype.
 - (b) genotype.
 - (c) environment.
 - (d) gametes.

- 6. Which factor does **not** affect the ability of a country to have a comparative advantage in a particular product?
 - (a) availability of land
 - (b) cost of labour
 - (c) international exchange rate
 - (d) favourable climatic conditions
- 7. A direct example of producers responding to consumer trends is the
 - (a) supply chain assurance program for live export.
 - (b) National Livestock Information System (NLIS).
 - (c) Computer Aided Livestock Marketing (CALM).
 - (d) Meat Standards Australia (MSA) grading system.
- 8. Duty of care in the workplace and to the environment is related directly to
 - (a) sustainability.
 - (b) intergenerational equity.
 - (c) quality assurance.
 - (d) risk management.
- 9. When a newborn drinks colostrum the immunity it receives is known as
 - (a) natural passive.
 - (b) natural active.
 - (c) artificial passive.
 - (d) artificial active.
- 10. While biological control is effective against pests, one of the **major** concerns about it is that
 - (a) its effects may not be confined to the pests.
 - (b) the pest may develop resistance.
 - (c) it may not persist long enough.
 - (d) it may damage the environment.
- 11. A common risk avoidance tool in agriculture is
 - (a) monoculture.
 - (b) diversification.
 - (c) niche marketing.
 - (d) increased land holdings.

- 12. A hypothesis should be
 - (a) testable.
 - (b) replicated.
 - (c) randomised.
 - (d) standardised.
- 13. When a scientific experiment reports that the results are significant, it is telling the reader that
 - (a) the experiment has been a resounding success.
 - (b) the results cannot be attributed to chance.
 - (c) there is more work to be done to prove the results beyond doubt.
 - (d) the data differences are very small.
- 14. Which of the following **best** describes a pedigree?
 - (a) a method of predicting animal productivity
 - (b) a description of productive traits
 - (c) a method of tracking the ancestry of animals
 - (d) a ranking system for sires and dams based on genotypes
- 15. A whole farm budget is commonly used to
 - (a) calculate farm equity.
 - (b) show periods of high debt.
 - (c) compare profitability of different enterprises.
 - (d) assist with farm planning and analysis.

End of Section One

Section Two: Short answer 50% (111 Marks)

This section has **eight (8)** 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	(12 marks)
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A herd of 100 cows annually produces weaners with an average weaning weight of 300 kilograms. Currently, the market value of these weaners is \$1.80 per kilogram live weight.

ne one breeding technology and describe how it could be used to improverage weaning weight quickly.	e this herd's/ (3 marks/

(b) When selecting sires using Estimated Breeding Values (EBVs) a financial comparison can be made. From the data below, select the sire whose EBVs will make a significant improvement in weaning weight and calculate the selected bull's financial value to the breeding herd outlined in part (a). (4 marks)

Weight Group Breedplan EBVs (kg) for Beef Cattle

Bull	Birth-weight	200-day growth	600-day weight
Α	– 1	+10	+45
В	+2	+14	+28
С	+5	+16	+50
D	+2	+10	+30
E	+1	+10	+40
Average	+2	+12	+35

Selected bull:	
Financial value	
Financial value:	

Question 16 (continued)

(c)	(i)	Define heritability. (2 r	marks)
	(ii)	If the heritability of weaning weight is 0.3, explain how this could influence you decision whether to purchase this bull or not. (3 r	our narks)

Question 17 (12 marks)

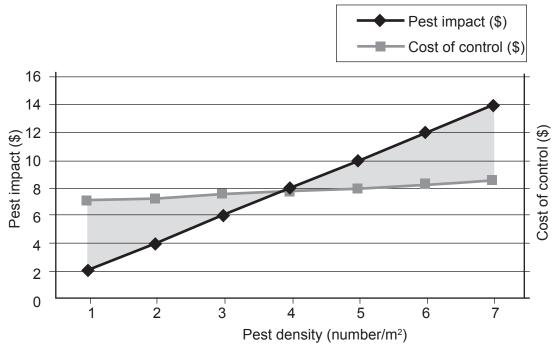
Manipulation of breeding techn	iques enables pr	roducers to m	aximise production.
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the birth of the firs	et and last offspring in a breedi	ng season.	(3 marks
Name and describ conception rates.	oe, using an example, one tech	nnique that is commo	nly used to increas (3 marks
	pe two strategies that are used	I to increase the num	ber of offspring (6 mark
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Name and describ weaned.	pe two strategies that are used	I to increase the num	ber of offspring (6 marks
	pe two strategies that are used	I to increase the num	ber of offspring (6 marks
	pe two strategies that are used	I to increase the num	ber of offspring (6 mark

(b)

Question 18 (14 marks)

Parts (a)(i) and (ii) of this question refer to the graph below.



- (a) (i) On the graph place an 'A' at a point at which economic injury level is reached for a pest. (1 mark)
 - (ii) On the graph place a 'B' at a point at which control of the pest is uneconomic. (1 mark)
 - (iii) List **one** strategy for avoiding the high cost of controlling the pest. (1 mark)

Describe two ways active immunity develops in livestock.	(4 marks)	

Question 19 (16 marks)

A farmer producing prime lambs from pasture and feedlotting wants to check the financial viability of each method of production.

Income	Number of lambs	Kg/head	\$/kg	\$/head	Pasture Lambs	Feedlot Lambs
Pasture lamb sales	578	40	2.50	100	\$57 800	
Feedlot lamb sales	578	52	2.50	130		\$75 140
Total income					\$57 800	\$75 140

Costs		
Labour	\$2468	\$5018
Drenches	\$578	\$578
Vaccination	\$578	\$578
Lamb cartage	\$1156	\$1156
Commission on lamb sales	\$3179	\$3179
Feedlot ration		\$8670
Total costs	\$7959	\$19179
Gross margin		
Gross margin/head		

(a)	From the budget above calculate the			
	(i)	gross margin for each enterprise.	(2 marks)	
	(ii)	gross margin/head for each enterprise.	(2 marks)	
	(")		(Z Marko)	

List two main reasons for the differences in gross margins between the enterprise	es. 2 marks
Which of the calculations in part (a) provides the farmer with accurate data to ma enterprises?	ınage his 3 marks
What advice would you give the farmer regarding the financial viability of the feed enterprise?	dlot lamb 3 marks
List and discuss two strategies you could use to mitigate financial risk in this feed (dlot. 4 marks

(a)

(13 marks) **Question 20**

A pig producer uses wheat to finish porkers. Due to a poor season wheat has become unavailable but triticale, which has the same nutritive value, can be obtained.

(a)		Devise a simple experiment that will test growth rates of pigs fed two different grain die using the following headings; (9 mar			
	(i)	Hypothesis	(1 mark)		
	(ii)	Dependent variable	(1 mark)		
	(iii)	Independent variable	(1 mark)		
	(iv)	Standardised techniques to minimise sources of error.	(6 marks)		

Design a record to collect measurements from the trial in part (a) and describe accuracy can be maintained when collecting raw data.	how (4 marks)

Question 21	(18 marks)
Question 21	

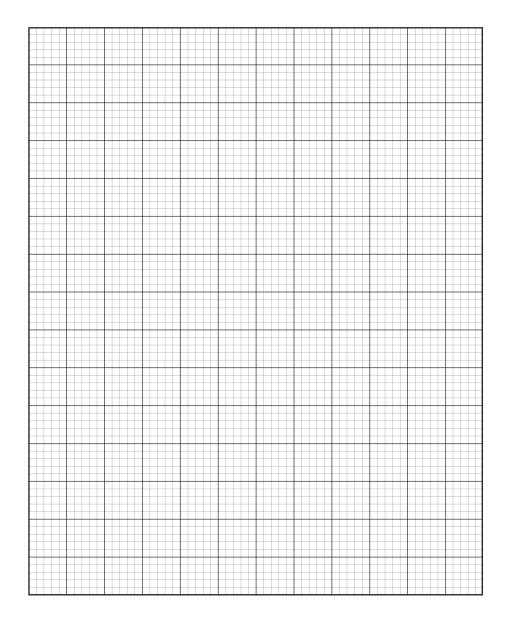
In some situations, growth promotants can increase profits without having a harmful effect on meat quality.

Explain the function of a growth promotant in livestock production.	(2 marks)
Describe and advantage and and disadvantage of using growth promotents	(4 marks)
Describe one advantage and one disadvantage of using growth promotants.	(4 marks)

(c) The data below was presented at a beef producers' seminar to encourage producers to use growth promotant treatments. (6 marks)

Treatment duration (days)	Mean liveweight gain of treated group (kg/head)	Mean liveweight gain of untreated group (kg/head)
0	0	0
20	15	20
40	40	50
60	70	65
80	100	80
100	140	110

On the grid below, draw a graph of the mean live weight gain of the treated and untreated groups over 100 days. If you need to make a second attempt at this graph, the grid is repeated on the last page of this Question/Answer booklet. Indicate on this page that you have used the second grid and cancel the workings on this page.



Question 21 (continued)

se the growth prom	tnat would assist y	ou in deciding wheth (2 ma
wo aspects of the remaking an inform	ign of the trial in pai	t (c) you would need (4 ma

Question 22	(12 marks)
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Within an ecosystem, the flow of energy can be identified.

		s and decomposers ir your diagram. (6 mar
ls tl	his a feedback loop? Explain your answer.	(3 mar
	до се	(0.1110)

Question 22 (continued)

:)	Name and describe one strategy you could implement to conserve the biodiver agricultural ecosystem.	rsity of an (3 marks)

tion 23	(14 marks)
Describe the two stages of breakdown of carbohydrates in ruminants.	(4 marks)
List two factors that determine the amount of energy you would include in t being fed to an animal.	he ration (2 marks)

Question 23 (continued)

(c) From the list below select **two** feeds that, when combined, would provide energy for a selected non-ruminant. Calculate the proportions of each feed if the energy requirement was 16 megajoules (MJ). Show your working. (5 marks)

Feed	Metabolisable energy content (MJ/kg of dry matter)
Wheat	13
Barley	10
Lupins	8
Oaten hay	7
Lucerne hay	9

Selected non-ruminant	(no marks)
Describe how you would apply least cost rationing to the ration part (c).	you have designed in (3 marks

End of Section Two

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Section Three: Production practices

15% (28 Marks)

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

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 number of the question that you are continuing to answer at the top of the page.

Suggested working time: 30 minutes.

Ques	stion 24		(28 marks)
The	viability (of a farm operation relies on sound knowledge of the marketed pro	duct.
Nam	e an ani	mal production enterprise you have studied and state its marketed	product.
Anim	ıal produ	uction enterprise:	(no marks)
Mark	eted pro	oduct:	(no marks)
(a)	(i)	Describe a quality assurance (QA) program for the marketed pro	duct above. (3 marks)

	(ii)	Discuss two on-farm practices that are required to meet the quality assurance program listed in part (a) (i). (6 marks)
))	Faced you m	with a 20 per cent reduction in price for your marketed product, list one change ight make and explain how it could allow you to meet the changed circumstances. (3 marks)

Question	24	(continued)
Question	44 1	COHUHUCU

	one technology and describe how it could be used to improve the efficiency of uction in the selected enterprise. (3 marks)
(i)	Name one pest or disease that could affect the quality of your marketed product. (1 mark)
(ii)	Describe the major impact that the pest or disease would have on the quality of your marketed product. (2 marks)

Discuss the use of multiple strategies to manage this pest or diseantegrated Pest Management (IPM) principles.	(10)

End of Section Three

Section Four: Extended answer 20% (40 Marks)

This section contains three (3) questions. You must answer two (2) questions. Write your answers in the spaces provided.

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Suggested working time: 40 minutes.

Question 25 (20 r	marks)
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	te change may affect your business and require you to review your operations to sustainable profitability.	ensure
(a)	Describe how climate change has developed. Nominate two long-term effects change on agricultural production in Western Australia and describe their impa	

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lo	or one impact described in part (a), explain two strategies that you could use to so ong-term sustainability. Describe how one of the strategies could be monitored to a rogress.
In	npact selected from part (a):
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Question 26 (20 marks)

Australia's ability to remain competitive in the global marketplace is based on its 'clean, green and ethical' image.

Name one Australian animal export, list its major export market and main compthe global economy. Describe two strategies that keep this export competitive.		
	(11	marks)

explain the role of the National Vendor Declaration (NVD) in the or Australia's export markets.	e compliance requirements (9 marks)

Question 27 (20 marks)

Intergenerational equity involves consideration of all the triple bottom line factors likely to be of benefit to future generations.

factor's sustainability. Describe how one of the actions could compromise	
intergenerational equity.	(10 marks)

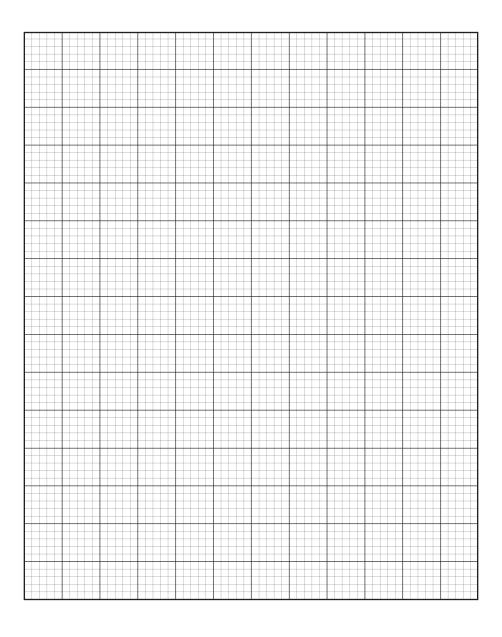
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Question 21



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