



Province of the
EASTERN CAPE
EDUCATION

NATIONAL SENIOR CERTIFICATE

GRADE 12

SEPTEMBER 2010

AGRICULTURAL SCIENCES – PAPER 2

MARKS: 150

TIME : 2½ hours



This question paper consists of 14 pages and an answer sheet.

INSTRUCTIONS AND INFORMATION

1. Answer ALL the questions from BOTH SECTIONS A and B.
2. SECTION A (QUESTION 1) must be answered on the attached ANSWER SHEET.
3. Place your ANSWER SHEET for SECTION A (QUESTION 1) within your ANSWER BOOK.
4. SECTION B (QUESTIONS 2 to 4) must be answered in the ANSWER BOOK.
5. Start each question from SECTION B on a NEW page.
6. Read ALL the questions carefully and answer only what is asked.
7. Number the answers correctly according to the numbering system used in this question paper.
8. The use of a non programmable calculator is allowed.
9. Write neatly and legibly.

SECTION A**QUESTION 1**

- 1.1 Various options are provided as possible answers to the following questions. Choose the answer and make a cross (X) in the block (A – D) next to the question number (1.1.1 – 1.1.10) on the attached ANSWER SHEET. NO marks will be awarded if more than one cross (X) appears for an answer.

EXAMPLE

1.1.11	<input checked="" type="checkbox"/> A	B	C	D
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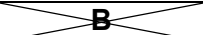
- 1.1.1 The quantity of maize demanded by the poultry farmers was equal to the quantity of maize supplied to the local market by producers. This situation could best be described as ...
- A the shortage of maize.
 - B a surplus.
 - C the hypothetical demand.
 - D the market equilibrium.
- 1.1.2 The type of budget that reflects when receipts are to be received and cash payments are to be made.
- A Cash flow budget
 - B Enterprise budget
 - C Whole farm budget
 - D Assets and liabilities
- 1.1.3 The following statement is NOT part of a strategic management plan for a farming enterprise.
- A Business strategy
 - B Mission statement
 - C Soil and climatic data
 - D Vision statement
- 1.1.4 At the beginning of October, peaches are more expensive than at the end of January, because ...
- A the supply of peaches to the market is strictly controlled during october.
 - B the supply of peaches in October is still limited.
 - C it costs more to have peaches on the market early in December.
 - D the earlier fruit has a better taste and quality.

- 1.1.5 The flow of labourers from the agricultural sector to other industries may be due to ...
- A better management.
 - B low level of training
 - C better working and service conditions.
 - D better living conditions.
- 1.1.6 The agricultural production factor which is subject to the law of diminishing returns is ...
- A labour.
 - B capital.
 - C management.
 - D land.
- 1.1.7 Capital that enables the producer to fund items required in the production process such as boreholes, fences, pumps etc. is referred to as ...
- A working capital.
 - B fixed capital.
 - C movable capital.
 - D medium term assets.
- 1.1.8 Selection of animals based on the quality of their offspring's is called ...
- A family selection.
 - B pedigree selection.
 - C progeny selection.
 - D mass selection.
- 1.1.9 A heterozygous individual has the following genotype for a qualitative genetic characteristic.
- A One dominant allele
 - B One dominant and one recessive allele
 - C Two dominant alleles
 - D Two recessive alleles
- 1.1.10 A breeding method that improves the uniformity in a herd.
- A Cross-breeding
 - B Inbreeding
 - C Species crossing
 - D Upgrading

(10 x 2) (20)

- 1.2 In the table below, a statement and two possible answers are given. Decide whether the statement in COLUMN B relates to A only, B only, both A and B or none of the answers in COLUMN A and make a cross in the appropriate block next to the question number (1.2.1 – 1.2.5) on the attached ANSWER SHEET..

EXAMPLE	COLUMN A		COLUMN B
	A:	Phenotype	The genetic composition of an organism
	B:	Genotype	

ANSWER	The statement refers to:			
	Only A	Only B	A and B	None
	A		C	D

COLUMN A / Answers			COLUMN B / Statements
1.2.1	A	Modern technology	Using salt and vinegar as food preservation method by farm managers
	B	Indigenous method	
1.2.2	A	Grading	The actual sorting process of products according to the agreed standard specifications
	B	Standardization	
1.2.3	A	Labour shortages	The main effects of HIV/AIDS on agriculture
	B	Loss of agricultural knowledge and skills	
1.2.4	A	Law of variation	Laws of Mendel that could be applied in animal production
	B	Law of segregation	
1.2.5	A	Heterozygous	An individual that has two different alleles for the same gene
	B	Homozygous	

(5 x 2) (10)

- 1.3 Give ONE word/term for each of the following descriptions. Write only the word/term next to the question number (1.3.1 – 1.3.5) on the attached ANSWER SHEET.

- 1.3.1 The total monetary value of goods produced and services provided in a country in one year
- 1.3.2 A budget for one particular enterprise on a farm
- 1.3.3 Agricultural legislation which promotes the return of land or provision of compensation to those who had land taken away from them in the past
- 1.3.4 The study of the inheritance of characteristics from generation to generation

- 1.3.5 A genetic term for a situation where the progeny shows higher performance or better characteristics more than both parents from different breeds
(5 x 2) (10)
- 1.4 Change the UNDERLINED WORD(S) in the following statements to make them TRUE. Write only the appropriate word(s) next to the question number (1.4.1 – 1.4.5) on the attached ANSWER SHEET.
- 1.4.1 Demand is the term indicating the amount of a commodity that a producer is willing to market.
- 1.4.2 Demarcation is a strategy that the farmer uses to reduce the risk by having a number of different enterprises on his/her farm.
- 1.4.3 Liabilities are things that you own and that have a financial value.
- 1.4.4 Credit is the amount of additional money paid over and above the amount borrowed.
- 1.4.5 Selection between individuals is determined by a combination of environment and genetics.
(5 x 1) (5)
- TOTAL SECTION A: 45**

SECTION B

Start each question in this section on a new page.

QUESTION 2 : PRODUCTION FACTORS AND MANAGEMENT

2.1 Fruit or vegetables are processed into various forms before they are sold to the market to satisfy the cultural or ethnical needs of the consumers.

2.1.1 Indicate a term for the changing of these products into different usable forms? (2)

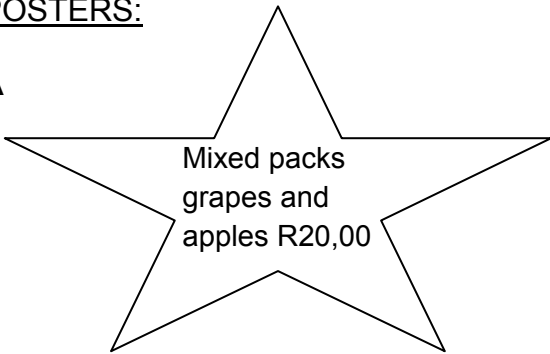
2.1.2 Consumers in a grape producing area prefer using grapes in a different form other than as fresh fruit. Indicate TWO forms in which it can be used by consumers. (2)

2.1.3 Suggest TWO advantages that the processing of products will have on producers and consumers. (2)


2.2 The following posters are shown in front of a supermarket. Match each poster to a pricing strategy from the list below.

POSTERS:

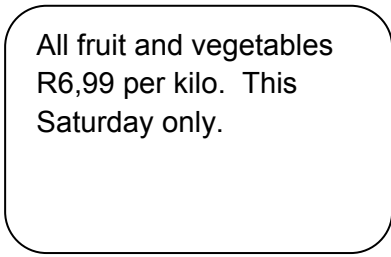
A




B




D



E



C

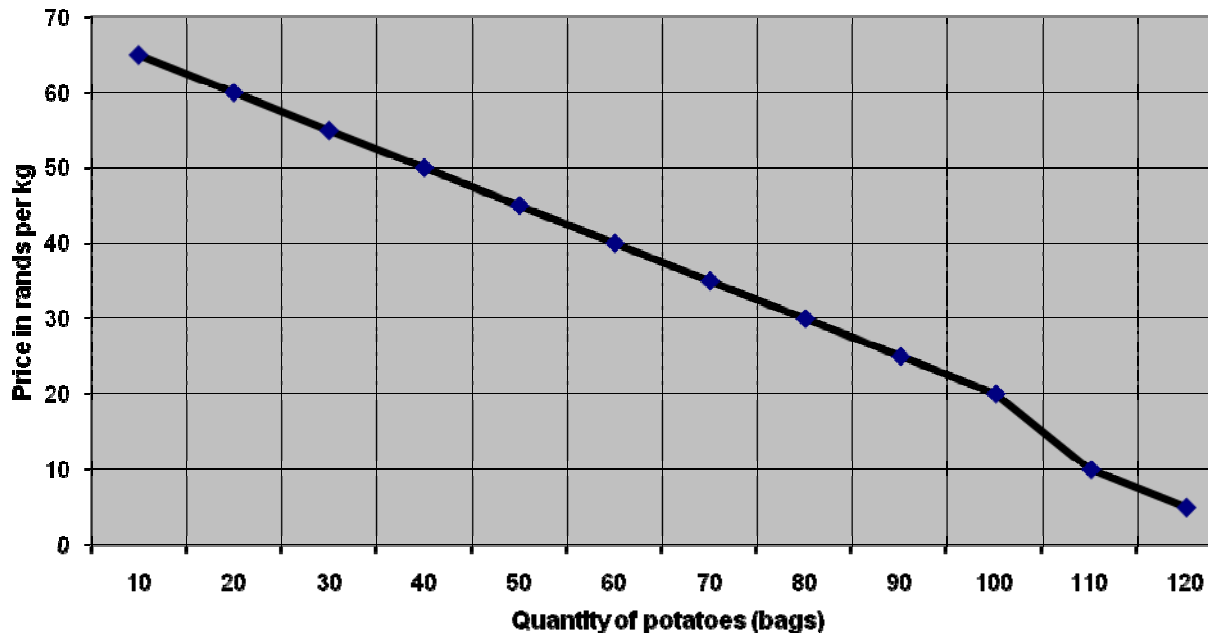


Pricing strategies

- Price lining
- Promotional pricing
- Loss leading
- Psychological pricing
- Product bundle pricing

(5)

- 2.3 The graph below represents the price of potatoes at different quantities supplied.



- 2.3.1 Identify the type of marketing curve that is illustrated above. (2)
- 2.3.2 Deduce the price when 80 bags of potatoes are purchased. (2)
- 2.3.3 Besides the price of the product, mention any THREE factors that are influencing the demand of a product at the market. (3)
- 2.3.4 Briefly explain the following concepts:
- (a) Elasticity of demand. (2)
 - (b) Collateral. (2)
- 2.4 The marketing of agricultural products is complicated by a number of factors and therefore requires specialised knowledge from the farmer or producer.
- Suggest any FOUR problems or challenges that will complicate the marketing processes. (4)
- 2.5 Whilst the farm gate marketing is still advantageous to the local consumers, internet marketing is increasingly becoming more popular with people.
- Justify this statement by giving TWO advantages of internet marketing. (4)

2.6 A farming enterprise is also a business enterprise:

2.6.1 Define the term *business plan*. (2)

2.6.2 Indicate business survival strategies that can help producers to sustain their businesses. (3)

[35]

QUESTION 3 : AGRICULTURAL MANAGEMENT

3.1 The following scenario refers to agricultural land:

Land is the most valuable natural resource of a country because of its economic characteristics. After 1994 a land reform programme was launched in South Africa and was aimed at re-dressing the imbalances of the past.

3.1.1 Name THREE economic characteristics of land as a production factor. (3)

3.1.2 Indicate the land reform programme that was introduced to deal with the following land issues:

(a) To address previously disadvantaged people to have access to land. (2)

(b) The provision of compensation to those who had land taken away from them in the past. (2)

(c) To improve the security of tenure of people occupying rural and peri-rural land. (2)

3.2 Various challenges are still faced by labour in South African agriculture.

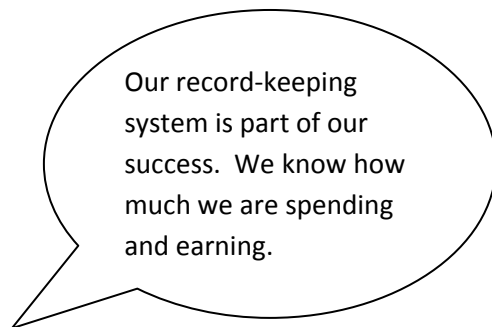
3.2.1 Farm managers in South Africa are still faced with the challenge of unskilled labour. Suggest TWO ways to overcome this challenge. (2)

3.2.2 Indicate the impact of HIV/AIDS on the productivity of farm labourers. (3)

3.2.3 The introduction of the Labour Relations Act (1995) by the state has played a vital role in the protection of farm workers' rights.

Suggest THREE ways in which this piece of legislation has empowered farm workers. (3)

- 3.3 The illustration below represents two businesses managed by two different entrepreneurs.



A.

B. Phaphamani Free Co-operation



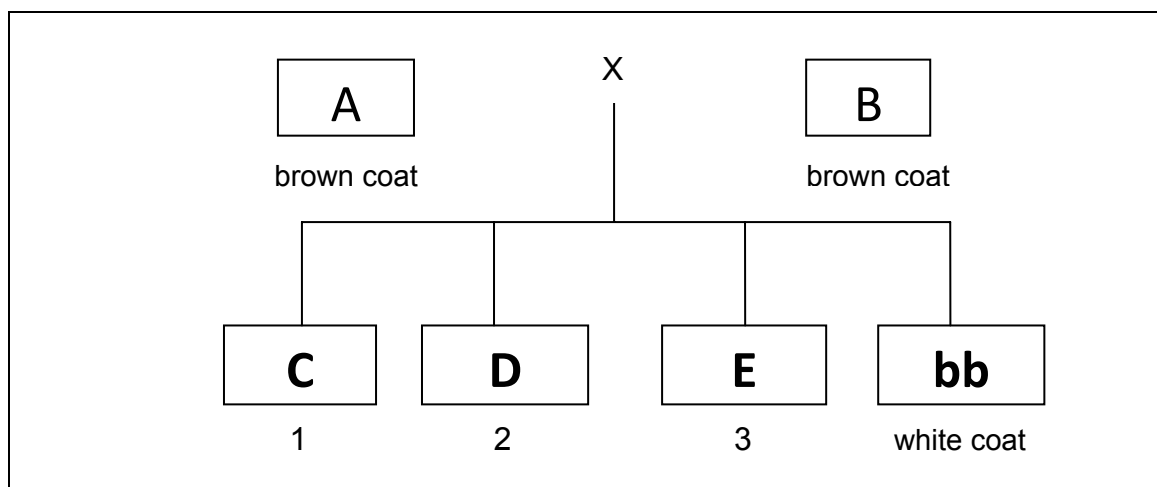
Vukawenze Agricultural Marketers

- 3.3.1 Identify TWO problems or challenges that are facing the manager of Phaphamani business and suggest ONE possible way to overcome the challenge. (3)
- 3.3.2 Indicate a way that record keeping benefited Vukawenze Agricultural Cooperation, by referring to the illustration above. (1)
- 3.3.3 Vukawenze Agricultural Cooperation is a successful business. Suggest FOUR important skills of a successful entrepreneur. (4)
- 3.3.4 Mention THREE methods of communication that can be used by an entrepreneur to promote his/her business. (3)
- 3.4 Agricultural operations are usually capital intensive. Access to capital is a big challenge for a prospective entrepreneur who wishes to enter the agricultural industry.
- 3.4.1 Differentiate between short-term credit and long-term credit. (4)
- 3.4.2 Suggest THREE problems associated with capital as a production factor. (3)

[35]

QUESTION 4 : BASIC AGRICULTURAL GENETICS

- 4.1 The gene for brown coat colour (B) in goats is dominant over that for white coat colour (b). Two brown-coated goats were mated.



- 4.1.1 Write down the genotypes of the parents indicated by A and B. (4)
- 4.1.2 Is the genotype of D homozygous or heterozygous? Explain your answer. (3)
- 4.1.3 Name TWO Mendelian laws involved in the transfer of hereditary characteristics. (2)
- 4.2 Mass selection and pedigree selection are traditional plant and animal improvement methods that have been used over the years to develop desirable characteristics.
- Distinguish between the genetic concepts underlined in the statement above. (4)

- 4.3 The scenario below shows different cultivars of tomatoes that may be crossed to breed a new cultivar. When cultivar A was crossed with cultivar B, the new cultivar that was developed showed a drastic improvement in yield more than both parents that were crossed.

CULTIVAR A	CULTIVAR B
Has a bush-like growth with short shoots and round, very fleshy fruit with a long shelf life. This tomato cultivar grows fast and ripens quickly.	Has long shoots, well suited for trellising, with a round, long, fleshy fruit that has very little juice. All the tomatoes on the bush become ripe simultaneously.

- 4.3.1 When cultivar A and cultivar B are crossed together the newly developed cultivar will show better characteristics than both parents. Give the genetic term for this situation. (2)
- 4.3.2 Select the most desirable characteristics from the scenario above that can be seen from the new cultivar due to the phenomenon described in QUESTION 4.3.1. (2)
- 4.4 A dairy farmer measured the milk production (yield) of each cow in his herd of dairy cows. The table below shows the result of his measurements.

MILK YIELD (ℓ)	TOTAL NUMBER OF COWS
0 – 4 000	1
4 001 – 4 500	8
4 501 – 4 800	15
4 801 – 5 200	19
5 201 – 5 600	14
5 601 – 6 000	6
6 001 – 6 400	1

- 4.4.1 Draw a bar graph to show the variation in milk yield of the cows. (5)
- 4.4.2 Indicate the type of variation shown in milk yield. (1)
- 4.4.3 Deduce the mean of the milk yield of the herd. (2)
- 4.4.4 The farmer wants to increase the milk yield of the herd but he/she is not sure as to which cows he should select for breeding, and he/she asked for your advice. Recommend a strategy that this farmer could adopt to select animals for breeding. (3)

- 4.5 The first GMO crop to be grown commercially in South Africa was tomatoes which was introduced in 1994. Today many GMO crops are used for commercial production which includes maize, soya beans and canola. These crops are resistant to specific herbicides. Some maize, cotton and potatoes GMO cultivars are even resistant to insect pests.

Below is a table indicating the yields obtained by two maize farmers respectively. Farmer A used conventional hybrid seed and Farmer B used seed.

YEAR	YIELD (T/HA)(FARMER A)	YIELD (T/HA)(FARMER B)
2000	10	10,2
2001	10,8	10,6
2002	9,6	12,0
2003	11,0	13,0
2004	10,4	15,0
2005	10,8	16,5

- 4.5.1 In what year did Farmer B change to GMO crops? Justify your answer. (3)
- 4.5.2 Indicate the main reason why there is resistance against the use of GMO cultivars or breeds. (2)
- 4.5.3 Suggest TWO advantages of genetic engineering techniques compared to the traditional improvement methods of selection and breeding. (2)

[35]

TOTAL SECTION B: 105

GRAND TOTAL: 150

CENTRE NUMBER

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EXAMINATION NUMBER

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SECTION A**QUESTION 1.1**

1.1.1	A	B	C	D
1.1.2	A	B	C	D
1.1.3	A	B	C	D
1.1.4	A	B	C	D
1.1.5	A	B	C	D
1.1.6	A	B	C	D
1.1.7	A	B	C	D
1.1.8	A	B	C	D
1.1.9	A	B	C	D
1.1.10	A	B	C	D

(10 x 2) (20)

QUESTION 1.2

1.2.1	A	B	C	D
1.2.2	A	B	C	D
1.2.3	A	B	C	D
1.2.4	A	B	C	D
1.2.5	A	B	C	D

(5 x 2) (10)

QUESTION 1.3

1.3.1

1.3.2

1.3.3

1.3.4

1.3.5

(5 x 2) (10)

QUESTION 1.4

1.4.1

1.4.2

1.4.3

1.4.4

1.4.5

(5 x 1) (5)

TOTAL SECTION A: 45

