



education

Department:
Education
REPUBLIC OF SOUTH AFRICA

**NATIONAL
SENIOR CERTIFICATE**

GRADE 12

AGRICULTURAL SCIENCES P2

EXEMPLAR 2009

MARKS: 150

TIME: 2½ hours

This question paper consists of 17 pages and an answer sheet.

INSTRUCTIONS AND INFORMATION

1. Answer ALL the questions.
2. SECTION A (QUESTION 1) must be answered on the attached ANSWER SHEET.
3. SECTION B (QUESTION 2 to 4) must be answered in the ANSWER BOOK.
4. Start EACH question from SECTION B on a NEW page.
5. Read ALL the questions carefully and make sure you answer only what is asked.
6. Number the answers correctly according to the numbering system used in this question paper.
7. Write neatly and legibly.

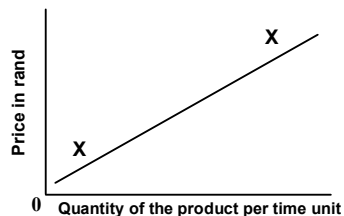
SECTION A**QUESTION 1**

- 1.1 Various options are provided as possible answers to the following questions. Choose the correct 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.

Example:

1.1.11	<input checked="" type="checkbox"/> A	B	C	D
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- 1.1.1 A farmer can decrease the risk of his income by ... the entire farming enterprise.
- A pawning
B selling
C insuring
D repairing
- 1.1.2 Which ONE of the following is NOT an advantage of free marketing?
- A Stimulates the entrepreneur to work harder
B Very little delay in receiving payment
C Go-betweens are encouraged
D Sales are for cash
- 1.1.3 The straight line **X** in the graphic representation represents the ...of the product.



- A market equilibrium
B shortage
C demand
D supply
- 1.1.4 Factors which hamper the marketing of agricultural products include ...
- A price of the product.
B distribution.
C production costs.
D market information.

- 1.1.5 The Basic Conditions of Employment Act (1997) addresses the following:
- A Labour, peace and democracy
 - B Advance economic development
 - C Working conditions for farm workers
 - D Safety of farm workers
- 1.1.6 One of the production factors needed in order to ensure maximum production is/are ...
- A buildings.
 - B labour.
 - C a middle man.
 - D transport.
- 1.1.7 The first step in any process of planning as well as in farming is ...
- A problem solving.
 - B formulation of objectives.
 - C collection of information.
 - D creation of capital.
- 1.1.8 The structure that is responsible for hereditary characteristics in animals is the ...
- A mitochondrion.
 - B golgi apparatus.
 - C chloroplast.
 - D chromosome.
- 1.1.9 A method of breeding used to develop hybrids is known as ...
- A cross-breeding.
 - B line-breeding.
 - C in-breeding.
 - D upgrading.

- 1.1.10 The Tuli-cattle breed was developed as a result of indigenous knowledge.



The offspring of this cattle breed would have the following characteristics:

- i very fertile
- ii resistance to damage by ticks
- iii development of fur during winter periods
- iv adaptability to extreme environmental conditions

Choose the correct combination:

- A i, ii and iii
 - B i, ii and iv
 - C i, iii and iv
 - D i, ii, iii and iv
- (10 x 2) (20)

- 1.2. Choose a concept from COLUMN B that matches a description in COLUMN A. Write only the letter (A – J) next to the question number (1.2.1 – 1.2.5) on the attached ANSWER SHEET, for example 1.2.6 N.

COLUMN A		COLUMN B	
1.2.1	Too much money invested in farming	A	prepotency
1.2.2	Food processing	B	gametogenesis
1.2.3	The milking shed as a capital item on a farm	C	fertilisation
1.2.4	The process by which female gametes are formed	D	copulation
1.2.5	When a hereditary characteristic of the parents is strongly visible in the offspring	E	atavism
		F	secondary industry
		G	over-capitalisation
		H	fixed capital
		I	spermatogenesis
		J	under-capitalisation

(5 x 2) (10)

- 1.3 Give ONE term/phrase for each of the following descriptions. Write only the term/phrase next to the question number (1.3.1 – 1.3.5) on the attached ANSWER SHEET.
- 1.3.1 The transformation of agricultural produce into a different product with a higher cash value
- 1.3.2 The actual sorting process of products according to standard specifications
- 1.3.3 A process that causes change in the economic system through innovation of individuals who respond to opportunities in the market
- 1.3.4 The modification of a gene structure of an organism
- 1.3.5 The method used in animal breeding to develop an identical replica of the parent animal, as was used to develop Doli the famous sheep
(5 x 2) (10)
- 1.4 Change the underlined words in the following statements to make them TRUE. Write only the appropriate word next to the question number (1.4.1 – 1.4.5) on the attached ANSWER SHEET.
- 1.4.1 Movable capital is the type of capital represented by fertiliser on a farm.
- 1.4.2 The cooperative system of marketing is used by chilli producing farmers who have decided to sell their produce through a single agent.
- 1.4.3 Casual labourers are employed for repetitive tasks such as the annual harvesting of a crop.
- 1.4.4 Dihybridism is the study of a single hereditary factor.
- 1.4.5 Breeds that have been bred overseas and imported into South Africa are indigenous breeds.
(5 x 1) (5)

TOTAL SECTION A: 45

SECTION B

Start this question on a NEW page in the ANSWER BOOK.

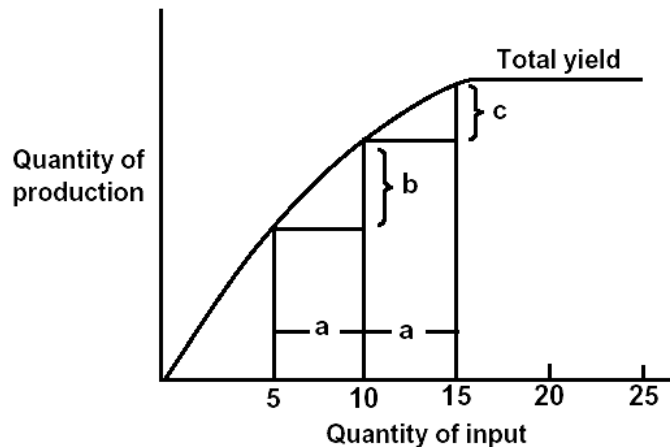
QUESTION 2

- 2.1 The values indicated in the table below represent potatoes that were sold at different prices and the quantities of potatoes (pockets) sold per week.

Price (rand per bag)	Quantity of potatoes (pockets per week)
5	2 500
10	1 500
15	1 000
20	800
25	500
30	250

- 2.1.1 Use the figures in the table above to draw a line graph from which some conclusions can be made. (6)
- 2.1.2 Deduce from the graph the price at which the biggest amount of potatoes was purchased by the consumers. Justify your answer. (2)
- 2.1.3 Give TWO reasons for the fluctuation (not constant) of the quantities of potatoes offered for purchase. (2)
- 2.2 You have been given a piece of land on which you produced tomatoes. When you brought your product to the market you found other producers supplying the very same product, tomatoes, and the market had surplus because of low demand.
- 2.2.1 Suggest TWO strategies of solving this problem of high competition. (2)
- 2.2.2 State TWO ways that an oversupply of tomatoes would affect you as a farmer. (2)
- 2.2.3 Name TWO technological aspects that would result in the increase of tomato yield on your land. (2)

- 2.3 The yield capacity of a soil is determined by its physical characteristics. The yield can be increased to a certain limit by intensification of capital and labour per unit or by means of improved technology, for example fertilisation. However a point is reached where production no longer increases with increased fertiliser application.



- 2.3.1 Identify the problem related to soil as a factor of production as illustrated in the graph and statement above. (2)
- 2.3.2 Describe the yield increase up to 15 quantities of inputs as illustrated by the graph. (2)
- 2.3.3 Indicate the yield response with regard to quantities of inputs ranging between 5 to 10 quantities of inputs and 10 to 15 quantities of inputs on the graph. (2)
- 2.3.4 Name TWO methods a farmer can use to improve the productivity of the soil. (2)
- 2.4 You are requested to address a group of farmers on free marketing of agricultural products. Your presentation should address the following aspects:
- 2.4.1 Channels through which products can be marketed in this way. (2)
- 2.4.2 TWO reasons for the fluctuation of prices in this free marketing system. (2)
- 2.4.3 The differences between this system and the pool system of marketing. (2)

2.5

Roshney lives on a farm in the Free State. His farm is not doing well and he is worried about how his family and his co-workers are going to survive. He hears that the government has passed a law that owners of the land have to remove alien trees from their properties by 2008. All of the property in their area is next to a river and they are densely covered with large blue gum trees.

Roshney thinks he can offer a service to farmers in the neighbourhood. He would like to cut down and remove the trees for them in exchange for wood. He does some research and then draws up a feasibility document for his business idea.

2.5.1 Identify a market for the goods that Roshney wants to offer. (1)

2.5.2 Name TWO resources that he will need to start this business. (2)

2.5.3 In what way will this new business venture benefit his co-workers? (2)

[35]

Start this question on a NEW page in the ANSWER BOOK.

QUESTION 3

3.1

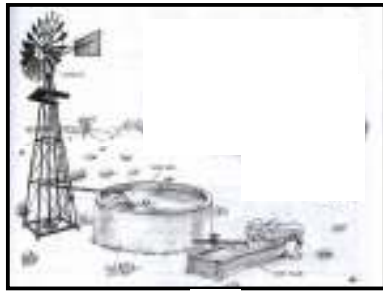
CASE STUDY

Mokgadi and her friend, Sanele, have recently acquired a 30 hectare piece of land near their village. This land is rented. After conducting an intensive research, they both decided to plant an indigenous crop, rich in starch and very much in demand by the local community and tourists. What they are not too certain about is whether their recently acquired land is suitable for this purpose.

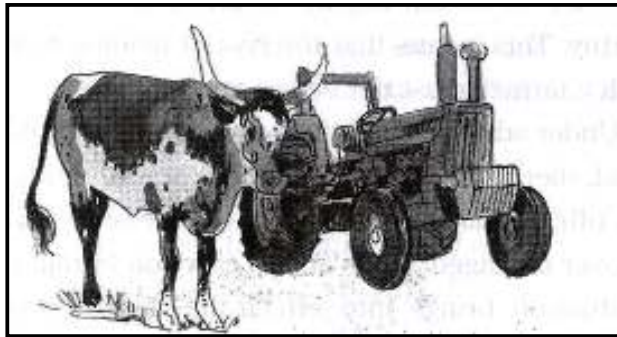


- 3.1.1 In terms of natural resources, indicate THREE aspects they should investigate to determine whether their land is suitable for their intended purpose. (3)
- 3.1.2 What negative impacts could a commercial vegetable operation have on the environment? (2)
- 3.1.3 Indicate ONE possible implication of establishing the operation on rented land. (1)
- 3.1.4 Give TWO examples of legislation governing natural resources. (2)

3.2 Study the illustrations below and choose the correct picture to fit the statements that follow.



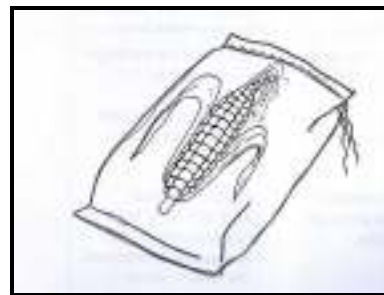
A



B



C



D



E



F

3.2.1 Write down the appropriate letter (A to D) of the item above that best fits the following statements:

- (a) Permanent durable asset (1)
- (b) This item is used to increase quality of produce (1)
- (c) Sold to earn a yearly income for the entrepreneur (1)

3.2.2 Identify TWO production factors that are visible in the illustrations above. Give the letter and description of each. (4)

3.2.3 Give an example of a primary natural resource from the illustrations above. Give a reason for your answer. (2)

- 3.3 A successful farm owner has come to realise that labour (his farm workers) is the most important asset on his farm.
- 3.3.1 A formal contract is drawn up between an employer (farm owner) and employee (farm worker) on a farm. Indicate THREE aspects which should be mentioned in this contract. (3)
- 3.3.2 This farmer needs to use temporary labour from time to time. Distinguish between seasonal and casual workers in the agricultural sector and give an example of each. (4)
- 3.3.3 Briefly discuss the current problem in South Africa with regard to the health issues that are threatening the stability of the farming labour force. (2)
- 3.4 Mr Dlamini set out to determine his cost and the possibility of enlarging his intensive sheep farming enterprise. He briefly identified the following cost items from the data he collected. His feedlot can handle a maximum of 30 000 sheep.



The following average data was gathered by Mr Dlamini:

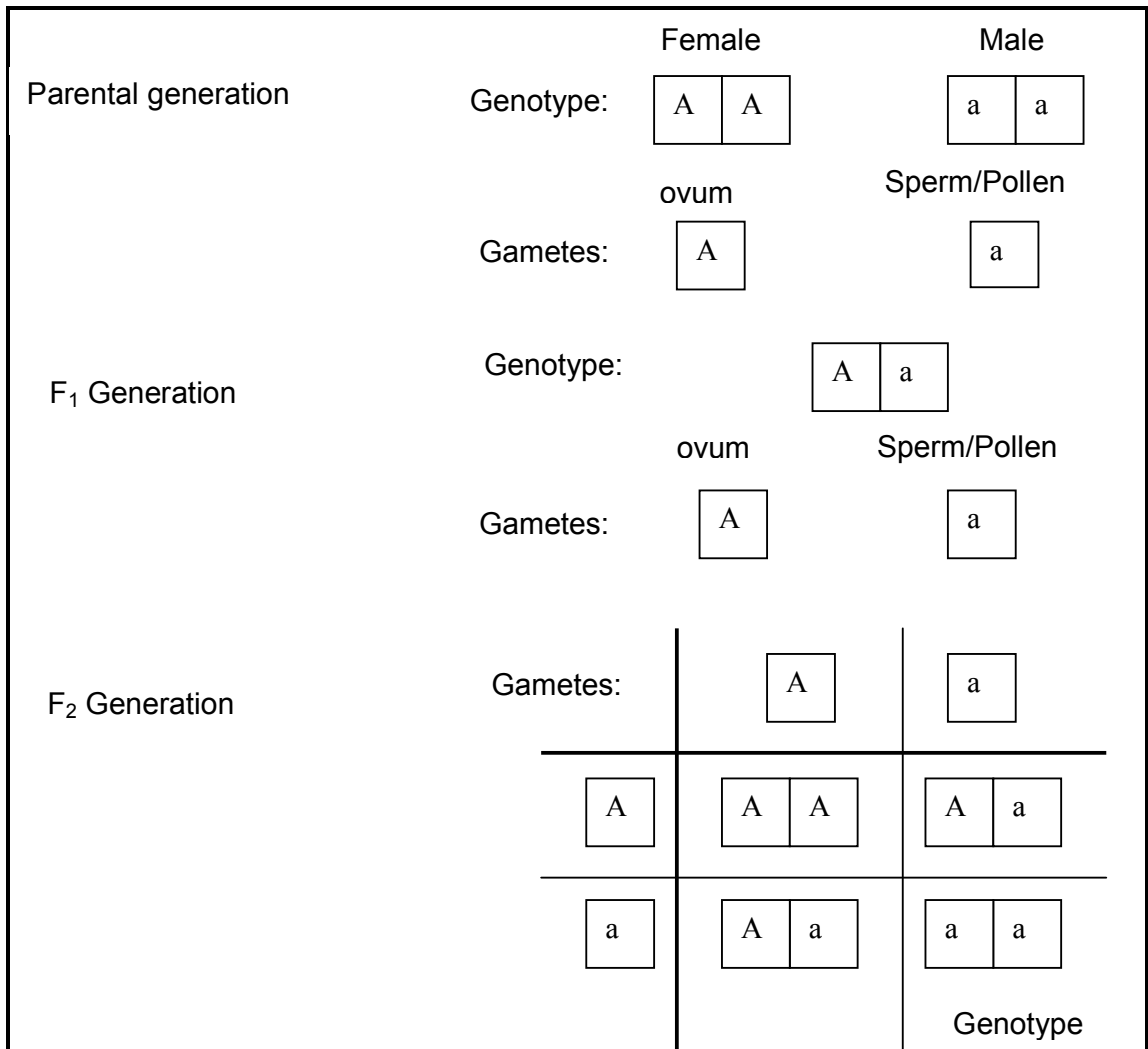
Feedlot (Total fixed cost): R220 000 per year
 Feedlot (Total running cost – 10 000 sheep): R3 000 000 per year
 Feedlot (Total running cost – 20 000 sheep): R6 000 000 per year
 Feedlot (Total running cost – 30 000 sheep): R9 000 000 per year
 Total cost = fixed cost per year + Total running cost of each feedlot.
 His average income per sheep per year is R350.

- 3.4.1 Mr Dlamini has an intensive production unit. Discuss the difference between fixed cost and running costs in this farming enterprise. (2)
- 3.4.2 Calculate the total fixed cost as a percentage of total cost for the 10 000, 20 000 and 30 000 sheep scenario using the data supplied above. (3)
- 3.4.3 Deduce from your calculation in QUESTION 3.4.2 the scenario with the lowest fixed costs. (1)
- 3.4.4 Calculate the profit per year per sheep for this unit running with 20 000 sheep. (3)
- [35]**

Start this question on a NEW page in the ANSWER BOOK.

QUESTION 4

4.1 The schematic representation below indicates how genotypes are passed down from one generation to the next.



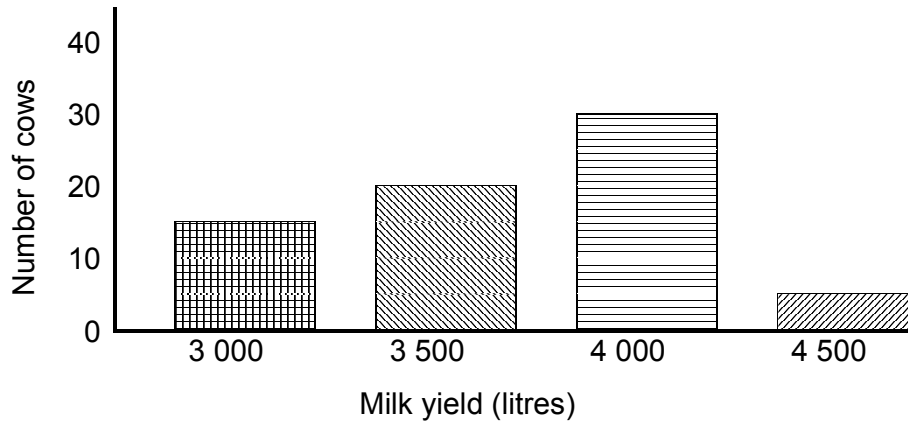
- 4.1.1 From the diagram above, indicate the parent who had the dominant trait. (2)

- 4.1.2 Compare the genotype of normal body cells (somatic cells) and that of reproductive cells/gametes. (2)

- 4.1.3 Determine the phenotypic segregation en genotypic segregation as percentages in the F₂ generation from the schematic representation above. (3)

4.1.4 Explain the difference between dominant and recessive traits. (2)

4.2 A dairy farmer measured the milk yield of his cows in his herd. The table below indicate the measurements in this regard.



4.2.1 Translate the illustrated bar graph above into a pie graph. (6)

4.2.2 Which cows would you select for breeding if you wanted to increase the milk yield of your herd? (2)

4.2.3 Indicate the production levels of the highest number of the population of the cows as illustrated in the bar graph. (1)

4.2.4 What type of variation is shown in the milk yield? (1)

4.3 The optimal production of a broiler unit is dependant on the growth rate and production output of such a unit. The following list of factors affects the growth rate of broiler chicken.

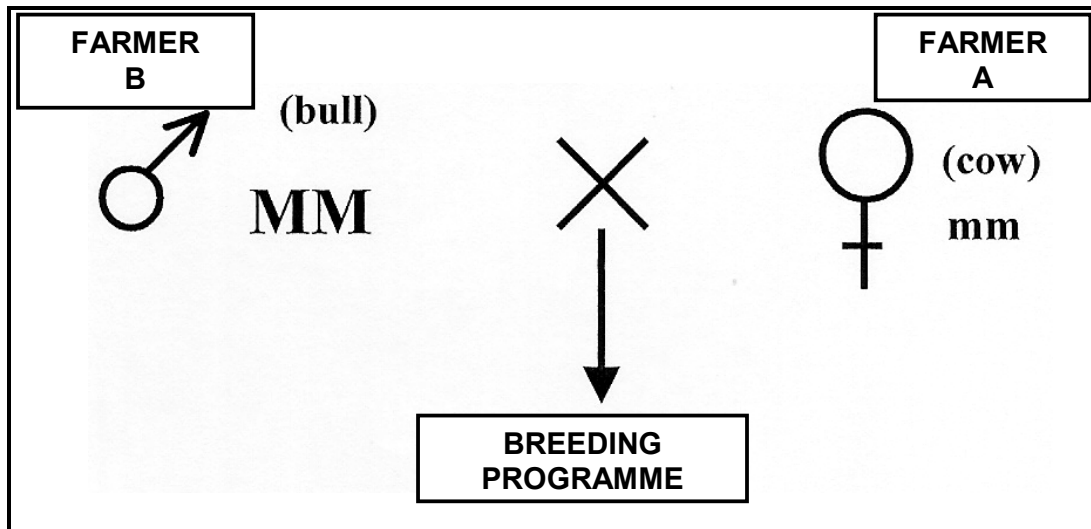
Temperature Disease Growth potential Starter ration

4.3.1 Name TWO factors from those listed above which are environmental factors that influence the production of broiler chicken. (2)

4.3.2 Identify the most important genetic environmental factor that influences the production in this broiler unit. Give a reason for your answer. (2)

4.3.3 The most cost effective way to increase the production output of such a broiler unit is through genetic improvement. Motivate this statement. (2)

4.4 Farmer B breeds a different breed of beef cattle from Farmer A. Farmer B wants to mate a bull with some of Farmer A's cows.



4.4.1 What is this type of breeding called? (1)

4.4.2 Indicate TWO benefits to farmer A in this breeding program. (2)

4.4.3 Identify a possible advantage for Farmer B in this breeding programme. (1)

- 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 conventional hybrid seed but later changed and used the latest available GMO 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? Give a reason for your answer. (2)
- 4.5.2 Indicate the main reason why there is resistance against the use of GMO cultivars or breeds. (1)
- 4.5.3 List THREE advantages of genetic engineering techniques compared to the traditional improvement methods of selection and breeding. (3)

[35]

TOTAL SECTION B: 105
GRAND TOTAL: 150

ANSWER SHEET

SECTION A

EXAMINATION NUMBER:															
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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