



Province of the  
**EASTERN CAPE**  
EDUCATION

**NATIONAL  
SENIOR CERTIFICATE**

**GRADE 12**

**SEPTEMBER 2015**

**AGRICULTURAL SCIENCES P2**

**MARKS: 150**

**TIME: 2½ hours**



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This question paper consists of 16 pages.

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**INSTRUCTIONS AND INFORMATION**

1. This question paper consists of TWO sections, namely SECTION A and SECTION B.
2. Answer ALL questions in the ANSWER BOOK.
3. Start EACH question on a NEW page.
4. Number the answers correctly according to the numbering system used in this question paper.
5. A non-programmable calculator may be used.
6. Show ALL your calculations, including formulae, where applicable.
7. 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 write only the letter (A–D) next to the question number (1.1.1–1.1.10) in the ANSWER BOOK, for example 1.1.11 D.

1.1.1 One of the following is not a component of a cash flow statement:

- A Opening balance
  - B Income
  - C Cash items
  - D A partial budget
- (2)

1.1.2 A decrease in performance with each generation caused by the crossing of two plants or animals that are closely-related, is called ...

- A variation.
  - B inbreeding depression.
  - C upgrading.
  - D incomplete dominance.
- (2)

1.1.3 Some of the activities involved in processing food crops and meat include the following:

- i fermenting, blending, drying
  - ii drying, storage, blending
  - iii canning, blending, milling
  - iv milling, planting, shipping
- A i, iii
  - B i, ii, and iii
  - C ii, iv
  - D i, iii, and iv
- (2)

1.1.4 Physical, chemical or biological agents that cause mutations or damage DNA molecules are called ...

- A replicates.
  - B mutants.
  - C mutagens.
  - D sex determinants.
- (2)

1.1.5 ... refers to the effective combination and coordination of all resources to achieve a specific goal, usually the maximising of profit:

- A Management
- B Foreman
- C Investment
- D Stewardship

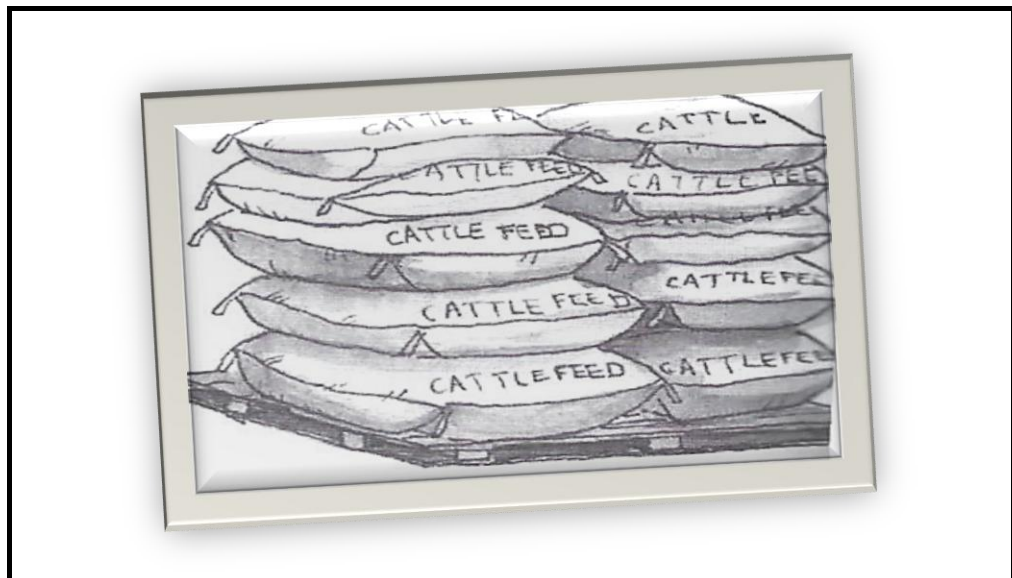
(2)

1.1.6 The process of bringing together resources and assets to make use of an opportunity to create a business venture and create a profit.

- A Entrepreneur
- B Entrepreneurship
- C Farm manager
- D Business planning

(2)

1.1.7 The figure below is an example of ... capital.



- A fixed
- B movable
- C working
- D unpaid

(2)

1.1.8 The ... of a business is the difference between the value of the assets and the value of the liabilities of that business.

- A variable cost
- B revenue
- C net worth
- D fixed costs

(2)

1.1.9 The most appropriate genotype representation in box **J** should be ...

	AB	Ab	aB	ab
AB	AABB	AABb	AaBB	AaBb
Ab	AABb	AAbb	AaBb	Aabb
aB	AaBB	AaBb	aaBB	aaBb
ab	AaBb	Aabb	aaBb	<b>J</b>

- A BbAb
- B bbba
- C aabb
- D AABB

(2)

1.1.10 ONE of the following is not regarded as a feature or characteristic of a market:

- A Focuses on the wants of buyers
- B Management is profit-oriented
- C Emphasis is on consumers' wants
- D Planning is short-term, based on current products and market

(2)

- 1.2 Choose a term/phrase 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) in the ANSWER BOOK, for example 1.2.6 K.

COLUMN A		COLUMN B	
1.2.1	One seller and many buyers	A	Depreciation
1.2.2	The use of statistics for analysis of biological data	B	Heritability
1.2.3	Value decreases over time	C	Labour Relations Act, Act 66 of 1995
1.2.4	Regulates working hours, leave, overtime, etc.	D	Prepotency
1.2.5	Proportion of observable traits between individuals due to genes	E	Monopsony
		F	Progeny
		G	Monopoly
		H	Basic Conditions of Employment Act, Act 75 of 1997
		I	Segregation
		J	Biometrics

(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) in the ANSWER BOOK.

- 1.3.1 A traditional method of selection that is based on the quality of an animal's ancestry (2)
- 1.3.2 Agricultural legislation that controls the sale, import and export of certain agricultural products, which ensures that products comply with required levels of quality (2)
- 1.3.3 A fixed property, such as a piece of land, owned by a farmer that can be sold by a bank if the farmer does not pay back a loan (2)
- 1.3.4 A tool that is effective in identifying strengths and weaknesses used for examining opportunities and threats in an enterprise (2)
- 1.3.5 The combined term used to describe the four elements of a marketing strategy (2)

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) in the ANSWER BOOK.

- 1.4.1 Heritability is the repeated mating of pure-bred male animals with inferior female animals, generation after generation. (1)
- 1.4.2 Overcapitalisation means not investing enough capital to produce optimum or best returns. (1)
- 1.4.3 An estimate of how much better, or less than average, the offspring of an individual will be for a particular characteristic is called biometrics. (1)
- 1.4.4 An individual who buys and uses goods and services is an entrepreneur. (1)
- 1.4.5 Species crossing is the mating of related animals so that the progeny remain closely related to a particular outstanding ancestor. (1)

**TOTAL SECTION A: 45**

## SECTION B

### QUESTION 2: AGRICULTURAL MANAGEMENT AND MARKETING

Start this question on a NEW page.

- 2.1 The illustration below indicates the sale of vegetables by a marketing firm. The manager (seller) of the firm wishes to dispose of all the vegetable stock on the shelves in order to stock fresh vegetables.



- 2.1.1 Indicate TWO implications of the 20% discounted price of the vegetables to the manager (seller). (2)
- 2.1.2 Explain the law of DEMAND with reference to the discounted price in QUESTION 2.1. (2)
- 2.1.3 List THREE factors that could influence the SUPPLY of the above product in a short time. (3)
- 2.2 Many entrepreneurs require funding to start their business. They therefore have to provide the funding institutions with a **plan** that is understandable and provides comprehensive information about the intended business. This plan consists of several components including the financial plan. The financial plan provides information on how much money is going to be needed and how the money is going to be managed.
- 2.2.1 Identify the plan referred to in the extract (2.2) above. (1)
- 2.2.2 State THREE elements that form part of a financial plan. (3)
- 2.2.3 Suggest TWO intentions of having the plan, mentioned in QUESTION 2.2.1 above. (2)
- 2.2.4 Identify TWO problems that may be encountered when drawing up the plan, as mentioned in QUESTION 2.2.1 above. (2)



- 2.3 Your school produces fresh vegetables during the winter season. You must transport the vegetables from the farm to consumers several kilometres away from your school. You must do the packaging and you have been provided with crates, cartons and bulk bins for the necessary handling, transporting and marketing of the vegetables. The vegetables produced by the school are said to be cheaper and a change in price usually affects the demand. Any vegetables that are not bought by consumers must be processed.

2.3.1 Mention TWO important aspects of packaging in vegetable farming. (2)

2.3.2 Explain THREE advantages of processing vegetables. (3)

2.3.3 Provide an appropriate economic term for the underlined phrase in QUESTION 2.3. (1)

2.3.4 List TWO factors that affect the underlined phrase in QUESTION 2.3. (2)

- 2.4 The data below indicates the demand and supply of mangoes on a farm. Use the information to answer the questions that follow.

Most agricultural producers usually face the problem of being too small to face big challenges alone. Big businesses have their own marketing departments and finance divisions and can reduce costs by purchasing inputs in great quantities and getting big volume discounts. In order to have the same benefits as big businesses, agri-producers can join their efforts together to form agricultural cooperatives. One advantage enjoyed by cooperative organisations is that they have better bargaining power on the market.

2.4.1 Indicate ONE way in which big businesses can reduce costs from the scenario in QUESTION 2.4. (1)

2.4.2 Justify the underlined statement in the scenario in QUESTION 2.4. (2)

2.4.3 Differentiate between *controlled marketing* and *cooperative marketing*. (4)

	<b>A</b>	<b>B</b>	<b>C</b>	<b>D</b>
2.5	Identify an opportunity and generate business ideas	Plan the business	Mobilise the necessary resources	Establish the business

Match the statements in QUESTIONS 2.5.1; 2.5.2; 2.5.3 and 2.5.4 with the most appropriate blocks labelled **A**, **B**, **C** and **D**. Write down ONLY the letter of the correct block, for eg. 2.5.5 E.

2.5.1 Registering a suitable legal entity such as cooperative, hiring staff, focusing on production, generating income (1)

2.5.2 Surveying the market, looking at available skills and resources and deciding the viability of the business (1)

2.5.3 Looking for funding and buying the required materials for production (1)

2.5.4 Prepare the documents that will show you what materials/tools you will need (1)

2.6 State ONE characteristic of a business that will make it less competitive. (1)  
**[35]**

**QUESTION 3: PRODUCTION FACTORS**

Start this question on a NEW page.

- 3.1 Labour is a combination of human energy and mental skill; it is the ability to do work. Labourers are generally paid a wage or salary based on the current rates as stipulated in the legislation. Labour has a significant impact on the success of a farming enterprise as it is one of the largest cost items in the agricultural sector. On-farm training of labourers, as well as short courses, are vital for labourers to keep up with the changing needs of the modern farm.

- 3.1.1 Identify TWO pieces of labour legislation referred in the scenario above. (2)
- 3.1.2 Justify your choices by giving supporting statements from the scenario. (2)
- 3.1.3 State TWO ways to reduce labour costs. (2)
- 3.1.4 Suggest ONE reason to justify the need for labour legislation in a work place. (1)
- 3.1.5 State TWO causes of labour shortages on commercial farms. (2)

- 3.2 Different forms of capital utilised on farms are shown in the illustration below. Answer the questions based on this illustration.



- 3.2.1 Name the examples of the types of capital in the picture that ...
- (a) would require long term credit to acquire.
  - (b) would require medium term credit to acquire. (2)
- 3.2.2 List TWO problems associated with the types of capital in QUESTION 3.2.1 above. (2)

- 3.3 An emerging farmer drew up an estimated income and expenditure plan of an enterprise. The table below indicates the plan of the farm enterprise.

INCOME			EXPENDITURE		
DATE	ITEM SOLD	PRICE (R)	DATE	ITEM BOUGHT	COST PRICE (R)
01/02	1 500 cabbage heads	8 500,00	04/02	Tomato seedlings	1 200,00
07/02	55 boxes of carrots	5 800,00	6/3	Repair cost of farm machinery	000,00
07/02	280 heads of cauliflower	4 250,00	7/3	Ploughing cost	3 500,00
08/02	180 bunches of spinach	900,00	11/3	N.P.K. fertiliser	2 300,00

- 3.3.1 From the data given in QUESTION 3.3, state TWO items that gave the farmer the most income. (2)
- 3.3.2 Estimate the farmer's expected profit or loss in QUESTION 3.3 above. (4)
- 3.3.3 Motivate, giving TWO reasons, why the farmer could be/is a commercial farmer. (2)
- 3.3.4 Distinguish between *enterprise budget* and *whole-farm budget*. (4)

- 3.4 Factors or forces that influence a farming business enable farmers to plan accordingly, particularly with regard to risk. External forces are those things which the farmer has little or no control over. However, they are critical to the success of the farming business. Internal forces either strengthen or hamper a business. It requires an effective manager to ensure that all the phases of production are carried out successfully.

- 3.4.1 From the scenario, list TWO effects of internal forces on a business. (2)
- 3.4.2 Suggest THREE internal forces that can make a farming business successful. (3)

3.5 Land is a factor needed in production.

3.5.1 Suggest TWO scientific methods to increase the productivity of land. (2)

3.5.2 Indicate the economic characteristic addressed by the following statements:

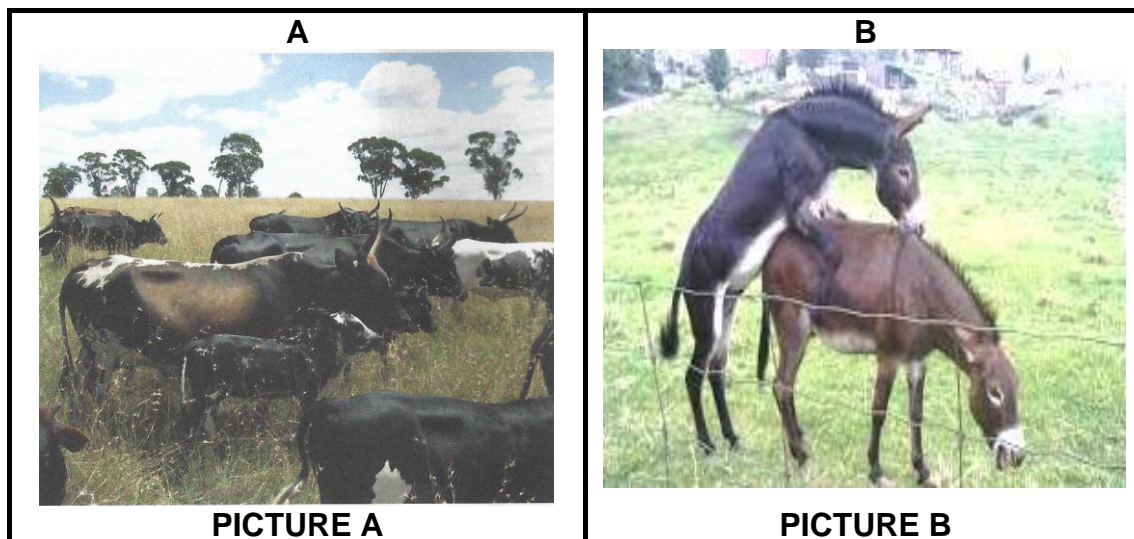
- (a) Yield increase not proportional to the quantities of fertiliser added.
- (b) Good, fertile fields needed for growing specific crops occur in places far away from the markets.

(c) Former agricultural land is now used for settlements. (3)  
**[35]**

**QUESTION 4: GENETICS**

Start this question on a NEW page.

- 4.1 The pictures below show two groups of animals. Picture A is made up of TWO different breeds of cattle. Picture B consist of a donkey and a horse  
Answer QUESTION 4.1.1 to 4.1.4 based on information in the pictures labelled A and B.



- 4.1.1 Indicate the type of breeding in picture **B**. (1)
- 4.1.2 Identify TWO disadvantages of the type of breeding in picture **B**. (2)
- 4.1.3 Mention the type of breeding that could be taking place in picture **A**. (1)
- 4.1.4 Give ONE term for the improved trait that could result from the breeding in QUESTION 4.1.3. (1)
- 4.2 

A Grade 12 learner in a laboratory placed cells of a recipient plant in a solution containing desired genes. The learner briefly passed an electric current through the solution to open up pores which allows the desired genes to enter the cells where they may be incorporated into the DNA of the plant.
- 4.2.1 Deduce, from the description above, the process demonstrated by the learner's activity in QUESTION 4.2. (1)
- 4.2.2 Indicate the technique used in QUESTION 4.2. (1)
- 4.2.3 State THREE aims of the process represented in QUESTION 4.2 in plant breeding. (3)

- 4.3 A commercial farmer has seven different breeds of sheep on four different experimental farms. There is a huge variation in the weights of the sheep in different farms. The record of samples of the lambs picked from the four farms are as follows:

Kilogram	Number of lambs
20–29	2
30–39	5
40–49	8
50–59	10
60–69	6
70–75	3
76–80	2

- 4.3.1 Translate the information in the table to a line graph. (5)
- 4.3.2 State TWO environmental causes of variation in the weight of the lamb. (2)
- 4.3.3 Indicate whether the characteristic that caused the type of variation in the table in QUESTION 4.3 is qualitative or quantitative. (1)
- 4.3.4 Justify your answer in QUESTION 4.3.3. (2)
- 4.4 A game animal breeder crossed a pure-breed rhino with short, black hair with another pure-breed rhino with long, white hair.

KEY	B = black	L = short
	b = white	l = long

- 4.4.1 Draw a Punnet square to show the results of the F1 cross using the key in QUESTION 4.4. (4)
- 4.4.2 Indicate the phenotypes of the offspring in the F1 generation with the gametes **bbll** and **BbLL**. (2)
- 4.4.3 State the phenotype ratio of the F1 generation. (1)

- 4.5 Different patterns of inheritance that lead to different phenotypes are indicated in the table below. Match the patterns of inheritance to QUESTIONS 4.5.1 and 4.5.2.

Epitasis  
Incomplete dominance  
Multiple allele  
Atavism

- 4.5.1 The expression of one gene is controlled by another gene. (1)
- 4.5.2 An inheritance which produces a heterozygote with a phenotype that is intermediate. (1)
- 4.6 State TWO advantages of cloning. (2)
- 4.7 Distinguish between *back-crossing* and *out-crossing*. (4)
- [35]**

**TOTAL SECTION B: 105**  
**GRAND TOTAL: 150**