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NATIONAL SENIOR CERTIFICATE

GRADE 12

SEPTEMBER 2025

AGRICULTURAL SCIENCES P2

MARKS: 150

TIME: 2½ hours

This question paper consists of 14 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 the 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. You may use a non-programmable calculator.
6. Show ALL 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 numbers (1.1.1 to 1.1.10) in the ANSWER BOOK, for example 1.1.11 D.

1.1.1 The process whereby raw products require some form of transformation before it can be used.

- A Grading
- B Packaging
- C Processing
- D Transportation

1.1.2 ... is NOT an example of an agricultural cooperative marketing system.

- A Purchasing cooperative
- B Production cooperative
- C Farm gate cooperative
- D Service cooperative

1.1.3 The objectives of the Marketing of Agricultural Products Act 47 of 1996 are as follows:

- (i) Optimising efficient marketing of agricultural products.
- (ii) Increase maximum marketing intervention and charging of high tariffs.
- (iii) Promote efficient marketing of agricultural products.
- (iv) Increase market access to all participants.

Choose the CORRECT combination:

- A (i), (ii) and (iii)
- B (i), (iii) and (iv)
- C (i), (ii) and (iv)
- D (ii), (iii) and (iv)

1.1.4 ONE of the following is NOT an entrepreneurial success factor.

- A Self-confidence
- B Determined
- C Competitive
- D Passive

- 1.1.5 A primary natural resource important for agricultural production:
- A Fertilizer
 - B Management
 - C Land
 - D Capital
- 1.1.6 The expenditure of a farming enterprise which changes as the level of production changes:
- A Fixed cost
 - B General cost
 - C Variable cost
 - D Miscellaneous cost
- 1.1.7 The management skill that allows the manager to process and analyse information, such as global market trends:
- A Problem solving skills
 - B Conceptual skills
 - C Planning skills
 - D Analytical skills
- 1.1.8 A method to improve labour productivity:
- A Providing better remuneration and incentives
 - B Inadequate education
 - C Long working hours
 - D Delay in resolving conflicts and grievances
- 1.1.9 The following statements describe polygenic inheritance.
- (i) Characteristics are controlled by two or more genes.
 - (ii) The dominant additive alleles contribute to the phenotype.
 - (iii) Polygenes results in qualitative characteristics.
 - (iv) Polygenic inheritance traits include milk yield and growth rate.
- Choose the CORRECT combination:
- A (i), (ii) and (iii)
 - B (ii), (iii) and (iv)
 - C (i), (ii) and (iv)
 - D (i), (iii) and (iv)
- 1.1.10 Cells that contain foreign genes that were deliberately transferred to its host, are ...
- A somatic cells.
 - B transgenic cells.
 - C mutagenic cells.
 - D osteoclast cells.

(10 x 2) (20)

- 1.2 Choose a term/phrase from COLUMN B that matches a description in COLUMN A. Write only the letter (A–J) next to question numbers (1.2.1 to 1.2.5) in the ANSWER BOOK, for example 1.2.6 K.

COLUMN A		COLUMN B
1.2.1	The path a product follows from the farmer to the consumer	A selling
1.2.2	The process of planning, production, pricing, promotion and distribution of goods and services	B external
1.2.3	The records where all farm assets are captured	C inventory
1.2.4	Forces in the micro and macro-economic environment which have an impact on the farm.	D marketing chain
1.2.5	An allele that is phenotypically expressed in a heterozygous organism	E dominant
		F marketing
		G internal
		H recessive
		I balance sheet
		J market channel

(5 x 2) (10)

- 1.3 Give ONE word/phrase for each of the following descriptions. Write ONLY the term next to the question numbers (1.3.1 to 1.3.5) in the ANSWER BOOK.

1.3.1 The practice of putting labels onto products to promote them as environmentally friendly.

1.3.2 An amount of money that a financial institution charges for lending capital.

1.3.3 A heterozygous offspring resulting from two genetically different parents.

1.3.4 The phenomenon by which one gene can affect the phenotypic expression of another gene.

1.3.5 The ability of an animal to transmit their complete set of characteristics to an offspring.

(5 x 2) (10)

- 1.4 Change the UNDERLINED WORD(S) in each of the following statements to make them TRUE. Write ONLY the answer next to the question numbers (1.4.1 to 1.4.5) in the ANSWER BOOK.
- 1.4.1 Mass Marketing is an approach that focuses on the needs of only a small portion of the mainstream consumer.
- 1.4.2 A cash flow statement is a summary of the assets and liabilities of a business.
- 1.4.3 The process of choosing individuals with desirable characteristics for breeding purposes is called variation.
- 1.4.4 Polyploidy is a type of mutation in which there is a change in the number of one or more of the chromosomes in the chromosome set of an individual.
- 1.4.5 The insertion of desired genes into the genes of a type of virus is known as micro-injection. (5 x 1) (5)

TOTAL SECTION A: 45

SECTION B**QUESTION 2: AGRICULTURAL MANAGEMENT AND MARKETING**

Start this question on a NEW page.

2.1 The table below shows the difference between a marketing and selling concept.

CONCEPT	FOCUS	DURATION OF PLANNING	END RESULT
A	Existing products and services	D	Profits through sales volume
B	C	Long term	Profit through customer satisfaction

2.1.1 Identify the concept from the table above that is represented by each of the following letters:

(a) **A** (1)

(b) **B** (1)

2.1.2 Complete the table by providing the missing information for the letters **C** and **D**. (2)

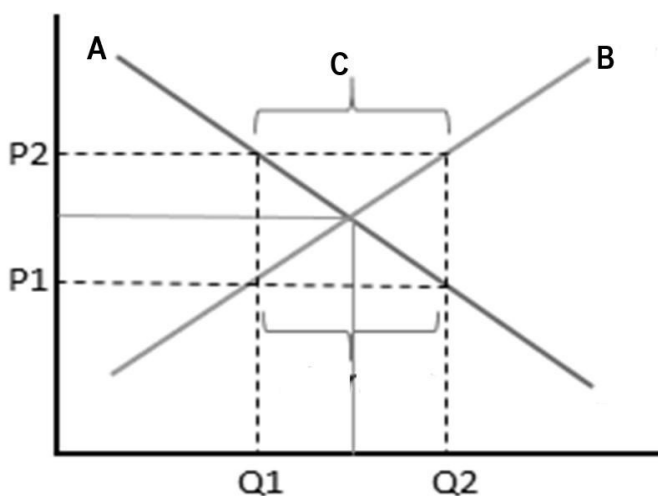
2.2 Correct packaging is critical to prevent bruising or spoiling of agricultural produce during storage and transportation. Farmers are encouraged to follow all the guidelines for packaging fresh produce to avoid post-harvest losses.

2.2.1 Provide TWO guidelines for packaging of fresh agricultural produce. (2)

2.2.2 Identify from the passage above, TWO other functions of marketing apart from packaging. (2)

2.2.3 State THREE ways the farmer can use to promote agricultural produce. (3)

2.3 Study the graph below and answer the questions that follow.



- 2.3.1 Identify **A** and **B** from the graph above. (2)
- 2.3.2 State TWO customer related factors that can affect **A**. (2)
- 2.3.3 Give the economic term represented by **C** in the graph above. (1)
- 2.3.4 Deduce the relationship between price and **B**. (2)
- 2.3.5 Differentiate between *market equilibrium point* and *equilibrium price*. (2)
- 2.4 The marketing channels in the box below are related to a free marketing system.

stock sales; fresh produce market; farm gate; direct marketing; internet

Match the marketing channel from the box above with EACH of the following statements. Write only the channel next to the question number.

- 2.4.1 The farmer cannot determine the maximum price for the animal, but the highest bidder does. (1)
- 2.4.2 Producers sell their produce to their final contractual customer without middlemen. (1)
- 2.4.3 Producers do not worry about high marketing costs before the product reaches the customer. (1)
- 2.4.4 The most competitive marketing strategies in terms of reaching global audience. (1)

- 2.5 State TWO advantages of free marketing to the entrepreneur. (2)
- 2.6 Below are the phases taken by the entrepreneur in the process of establishing the agricultural business.
- A** The entrepreneur decides on the venture's future growth and development.
 - B** Determination of the required resources.
 - C** Idea generation, where by the entrepreneur evaluates business opportunities.
 - D** Development of a comprehensive business plan.
- 2.6.1 Re-arrange the phases of entrepreneurial processes in their chronological order, write only the letters next to QUESTION 2.6.1. (4)
- 2.6.2 State TWO reasons for developing a document mentioned in **D** above. (2)
- 2.6.3 Identify the component of the business plan that gives a summary of the business profile. (1)
- 2.6.4 Give TWO examples of a business strength that give it a competitive advantage. (2)
- [35]**

QUESTION 3: PRODUCTION FACTORS

Start this question on a NEW page.

- 3.1 In an economic perspective, land is characterised by its scarcity, fixed supply and the ability to be improved, all of which influence its value and use.

Deduce the economic characteristic of land explained by the statements below. Write down only the question number and the answer.

- 3.1.1 Soil may be damaged, but cannot be destroyed. (1)
- 3.1.2 Land cannot produce anything by itself; it needs to be combined with other factors. (1)
- 3.1.3 Land has an unlimited lifespan. (1)
- 3.2 State TWO ways in which the productivity of land can be improved. (2)
- 3.3 Farm workers are generally unskilled with relatively low levels of technical skills. These conditions limit the scope of labour productivity in farms and result in most workers being replaced by mechanical aids.
- 3.3.1 Deduce a problem associated with farm workers from the passage above. (1)
- 3.3.2 Recommend TWO measures farmers can take to address the problem mentioned in QUESTION 3.3.1. (2)
- 3.3.3 Identify from the paragraph above, the impact of the problem mentioned in QUESTION 3.3.1. (1)
- 3.3.4 Give the labour legislation that could address the problem in the passage above. (1)
- 3.3.5 Suggest TWO economic ways that can be implemented to improve labour productivity. (2)

- 3.4 A farmer got a 10 ha farm using a bond worth R2 000 000,00 from Landbank. The farmer also bought a house worth R1 200 000,00, machinery and livestock worth R600 000,00 from profit generated from production. The farmer also took an overdraft of R100 000,00 to purchase some production capital.

- 3.4.1 Identify TWO methods of creating capital used by the farmer in the scenario above. (2)
- 3.4.2 Give ONE example of each of the following liabilities from the scenario above.
- (a) Long term liabilities (1)
- (b) Current liabilities (1)

3.4.3 Use the information provided in the scenario in QUESTION 3.4 to calculate the following.

(a) Total value of assets (2)

(b) Net worth of the farm (3)

3.4.4 State the problem of capital that is associated with borrowing. (1)

3.5 The table below shows the projection of the income and expenditure of a farm for the month of January.

EXPENDITURE		INCOME	
Item	Cost (R)	Products sold	Price per unit
Feed	R10 500,00	200 Broiler chickens	R150,00
Rent	R2 500,00		
Fuel	R2 500,00	20 bags of chicken manure	R75,00

3.5.1 Identify the type of the budget represented by the table above. (1)

3.5.2 Justify your answer to QUESTION 3.5.1. (1)

3.5.3 Identify ONE example of a fixed cost from the table above. (1)

3.5.4 Calculate the total income from the broiler enterprise in the table above. Show ALL calculations. (3)

3.5.5 Deduce with a reason whether this enterprise is viable or not, based on the table above. (2)

- 3.6 The picture below shows the impact of bad weather conditions on maize enterprises.



- 3.6.1 Identify the source of risk depicted in the picture above. (1)
- 3.6.2 Name TWO risk management strategies the maize farmer can apply to reduce the impact of bad weather conditions. (2)
- 3.6.3 List TWO main management principles for the successful management of a farming enterprise. (2)

[35]

QUESTION 4: BASIC AGRICULTURAL GENETICS

Start this question on a NEW page.

4.1 The differences in the phenotypic forms of plants and animals of the same species are influenced by both the genes and the environment.

4.1.1 Give a genetic term for the phenomenon in the statement above. (1)

4.1.2 Name TWO environmental causes that have an effect on the phenomenon mentioned in QUESTION 4.1.1. (2)

4.1.3 Define the following genetic concepts.

(a) *Phenotype* (1)

(b) *Heredity* (1)

4.2 A breeder crossed a homozygous black bull and a homozygous white cow and observed that all the F₁ offsprings were grey.

4.2.1 Use the Punnet square to illustrate the F₂ genotype when the F₁ offspring were self-crossed. (4)

4.2.2 Determine the phenotypic ratio of the F₂ offspring as a percentage. (2)

4.3 The table below shows the effects of additive genes on milk yield in dairy cows.

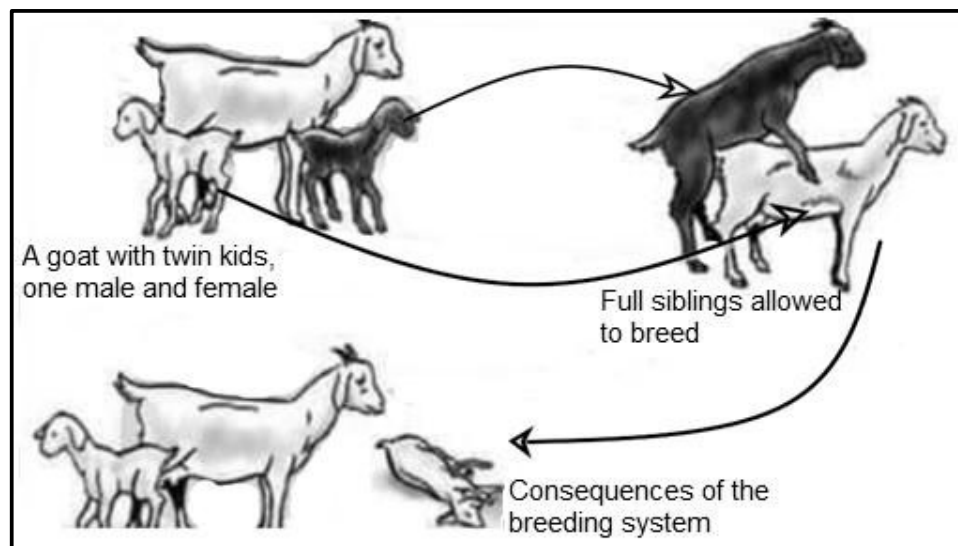
GENOTYPE OF DIFFERENT COWS	MILK YIELD (L/DAY)
aabbcc	10
Aabbcc	$10 + 5 = 15$
AAbbcc	$10 + (5 \times 2) = 20$
AABbcc	$10 + (5 \times 3) = 25$
AABBcc	$10 + (5 \times 4) = 30$
AABBCc	$10 + (5 \times 5) = 35$
AABBCC	$10 + (5 \times 6) = 40$

4.3.1 Translate the information in the table above into a bar graph. (6)

4.3.2 Deduce from the plotted graph the relationship between number of additive genes and milk yield. (2)

4.3.3 Suggest the genotype of the cow that would be best for selection and breeding purposes. Motivate your answer. (2)

4.4 The pictures below show the breeding system used in goat production.



4.4.1 Name the breeding system illustrated in the pictures above. (1)

4.4.2 Give a reason to support the answer to QUESTION 4.4.1. (1)

4.4.3 State TWO disadvantages of the breeding system illustrated above. (2)

4.4.4 Suggest TWO reasons why animal breeders recommend breeding of two animals that are not closely related to each other to farmers. (2)

4.5 The heritability value of slaughter weight characteristic in pig is 46 %.

4.5.1 Advise the piggery farmers whether they should select the characteristic in the statement above. Justify your answer. (2)

4.5.2 Give any TWO selection methods animal breeders can use to select animals with desirable traits. (2)

4.6 One of the advantages of genetic modification is that the transfer of genes from different species is possible, unlike traditional breeding programmes which can only cross related breeds.

4.6.1 Give TWO other advantages of genetic modification over traditional farming methods not mentioned in the passage above. (2)

4.6.2 State TWO main aims of genetic modification in animals. (2)

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TOTAL SECTION B: 105
GRAND TOTAL: 150