



basic education

Department:
Basic Education
REPUBLIC OF SOUTH AFRICA

SENIOR CERTIFICATE EXAMINATION

AGRICULTURAL SCIENCES P2

2015

MARKS: 150

TIME: 2½ hours

This question paper consists of 12 pages.

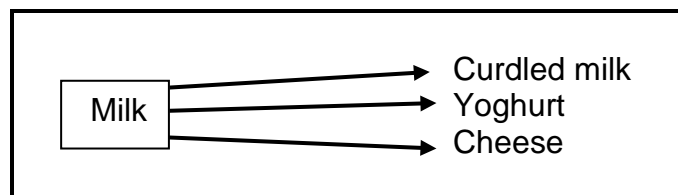
INSTRUCTIONS AND INFORMATION

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 and round off the answers to TWO decimal places.
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 A.

1.1.1 The product function that is indicated by the diagram below is ...



- A transport.
- B standardisation.
- C processing.
- D grading.

1.1.2 This is NOT a way to streamline and improve the agribusiness chain:

- A Improving roads to facilitate marketing
- B Provision of cellphones and Internet for easy access to marketing
- C Increasing transport costs by distributing the produce to nearby markets
- D Using cooling facilities to avoid oversupply to the markets

1.1.3 The following statement applies to eco-labelling:

- A It promotes product labelling as environmentally friendly.
- B The unsustainable labelling is directed at the consumer.
- C It has components that have a negative impact on the environment.
- D It does not take environmental concerns into account.

1.1.4 The following statement is NOT part of a SWOT analysis:

- A Identifying strengths and weaknesses of a business
- B Strategic planning tool to evaluate a business
- C Identifying opportunities and taking advantage of them
- D Strategic tool to punish workers

- 1.1.5 Credit obtained and repaid over a period of less than two years is known as ...-term capital.
- A long
 - B short
 - C medium
 - D short to medium
- 1.1.6 Any human endeavour, either physical or mental, that is performed in expectation of remuneration is ...
- A capital.
 - B labour.
 - C leave.
 - D salary.
- 1.1.7 An increase in input on land does not bring a proportionate increase in yield. This statement is associated with the following economic characteristic of land:
- A Land is durable.
 - B Land is restricted.
 - C Land is subject to the law of diminishing returns.
 - D Land is indestructible.
- 1.1.8 The smallest unit that has the ability to carry genetic information that is passed on from a parent to the offspring:
- A DNA
 - B RNA
 - C GMO
 - D Chromosome
- 1.1.9 The structure that is changed through the process of genetic modification:
- A Cell
 - B Genes
 - C Nucleus
 - D Antigen
- 1.1.10 The reappearance of a characteristic after a long absence in an animal population:
- A Prepotency
 - B Epistasis
 - C Incomplete dominance
 - D Atavism
- (10 x 2) (20)

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

COLUMN A	COLUMN B
1.2.1 Hedging	A temporary labour
1.2.2 Water canal	B an example of movable capital
1.2.3 Assets	C the production of an identical copy of biological material
1.2.4 Biolistics	D contract to ensure a secure market and price for produce
1.2.5 Cloning	E physical items of economic value
	F an example of fixed capital
	G more than two ventures on the same farm
	H genetic modification technique

(5 x 2) (10)

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

- 1.3.1 A commodity a producer offers for sale at any given price
- 1.3.2 The difference between the value of the assets and the value of the liabilities
- 1.3.3 Money that comes into and goes out of the farmer's bank account
- 1.3.4 The differences in the phenotypes of plants or animals of the same species due to genes and environment
- 1.3.5 The type of selection whereby an individual is selected based on records of its ancestors

(5 x 2) (10)

1.4 Change the UNDERLINED WORD in each of the following statements to make them TRUE. Write only the answer next to the question number (1.4.1–1.4.5) in the ANSWER BOOK.

1.4.1 Cooperative marketing is a marketing strategy where government determines and announces the price of a commodity.

1.4.2 Planning is a management skill that gives direction to workers and influences them to achieve their goals.

1.4.3 Market strategy indicates a condition where the amount of a product the consumers require is exactly equal to the quantity that a producer wants to sell.

1.4.4 Manipulation is a situation where too much capital is invested in relation to other production factors.

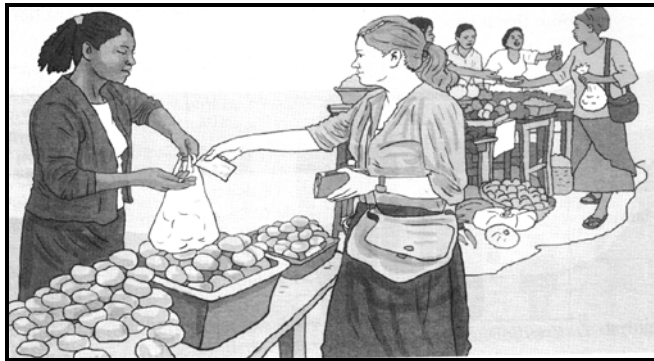
1.4.5 Roses with pink flowers (R) and roses with white flowers (r) will produce an F₁-generation with red flowers. (5 x 1) (5)

TOTAL SECTION A: 45

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

Start this question on a NEW page.

2.1 The illustration below represents a specific type of marketing.



2.1.1 Identify the type of marketing illustrated above. (1)

2.1.2 Explain why the producer in this type of marketing should do the following:

(a) Show initiative and drive (2)

(b) Provide products of good quality (2)

2.1.3 State THREE guidelines for farmers to streamline and improve the marketing chain of produce. (3)

2.1.4 State TWO approaches in the marketing of agricultural produce. (2)

2.2 A dairy farmer struggles with a dairy operation and is under severe financial constraints due to the low price of milk. There is an area on the farm where black wattle trees grow very well. The farmer was informed that government has passed a law that all alien trees must be removed from farms and properties. The farmer has now started a business that renders a service to other farmers and property owners in the area by cutting down alien trees.

2.2.1 Give an appropriate business management term for each of the following:

(a) This farmer's tree-felling venture (1)

(b) The majority of the trees are cut into smaller pieces and sold as firewood. Some are used to produce charcoal. (1)

(c) A small portion of clients asked for specific cuts of wood. (1)

(d) Factors and threats that can harm the venture (1)

(e) The farmer takes precautionary measures to protect workers from danger and injuries. (1)

2.2.2 State THREE benefits that this tree-felling venture will have for the farmer. (3)

2.3 Agricultural cooperatives engage in producing, processing and marketing agricultural products. In addition to these, cooperatives also supply inputs and services to their members.

2.3.1 Give THREE examples of agricultural cooperatives. (3)

2.3.2 State THREE advantages of agricultural cooperatives. (3)

2.3.3 List THREE principles of agricultural cooperatives. (3)

2.4 The data below represent the supply and demand of tomatoes.

PRICE PER KG (RAND)	QUANTITY DEMANDED (BOXES)	QUANTITY OFFERED (BOXES)
14	35	10
17	30	15
20	25	20
23	20	25
27	15	30
30	10	35

2.4.1 Draw a line graph to indicate the supply and demand of tomatoes on ONE graph. (6)

2.4.2 Deduce the relationship between supply and price from the graph. (2)
[35]

QUESTION 3: PRODUCTION FACTORS

Start this question on a NEW page.

3.1

A potential farmer intended to start a business and borrowed R25 000 from the bank. This farmer did not start immediately after obtaining the loan. By the time the business was established the total debt increased to five times the original amount. The profit was on average R12 000 per year, except for the first year when the profit was only 18% of the initial principal debt.

- 3.1.1 Determine the total debt of the entrepreneur after the enterprise was finally established. Show ALL calculations. (2)
- 3.1.2 Calculate the profit for the first year of operation. (2)
- 3.1.3 Calculate the profit (as a percentage) for the third year. (3)
- 3.1.4 State TWO other ways of obtaining capital, except for borrowing. (2)

3.2

Labour has a significant impact on the success and cost of any farming enterprise. On one particular farm, a farmer has four workers: a tractor driver, two general workers and a part-time cleaner. Labour on this farm is governed by legislation.

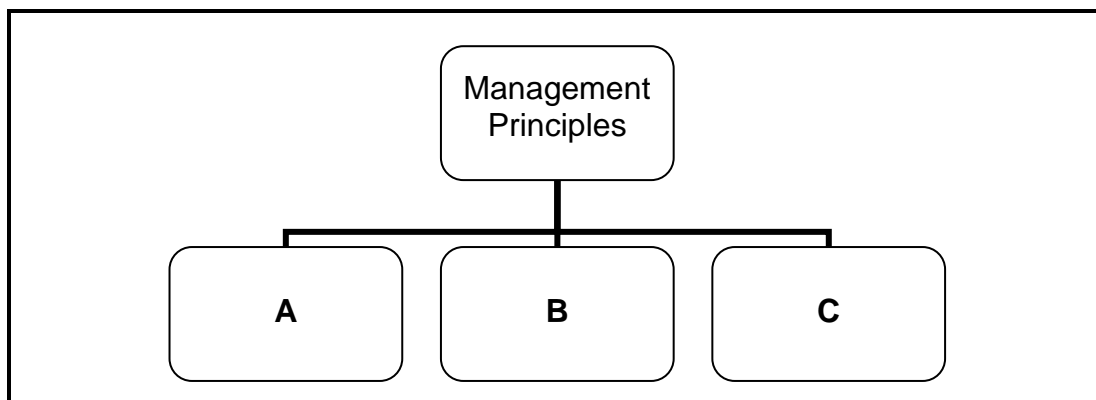
- 3.2.1 Identify, from the passage above, an example of each of the following:
- (a) Casual worker (1)
 - (b) Manager (1)
 - (c) Unskilled worker (1)
 - (d) Skilled worker (1)
- 3.2.2 Indicate the legislation that regulates the following:
- (a) Leave, working hours and deductions (1)
 - (b) Promoting economic development and social justice (1)
 - (c) Health and safety in the workplace (1)
- 3.2.3 State TWO measures this farmer could take to increase the productivity of farm workers. (2)

3.3 The picture below represents a production factor.



- 3.3.1 Identify the production factor in the picture above. (1)
- 3.3.2 List FOUR economic characteristics of the production factor named in QUESTION 3.3.1. (4)
- 3.3.3 Give THREE functions associated with the production factor named in QUESTION 3.3.1. (3)

3.4 Farm management requires both day-to-day planning as well as long-term strategic planning to ensure that the business achieves its goals, as illustrated in the flow chart below.



- 3.4.1 Define the term *management*. (2)
- 3.4.2 Give the THREE main management principles represented by **A**, **B** and **C**. (3)
- 3.4.3 List THREE aims of strategic management. (3)
- 3.4.4 Indicate the person responsible for the overall management of a farming enterprise. (1)

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QUESTION 4: BASIC AGRICULTURAL GENETICS

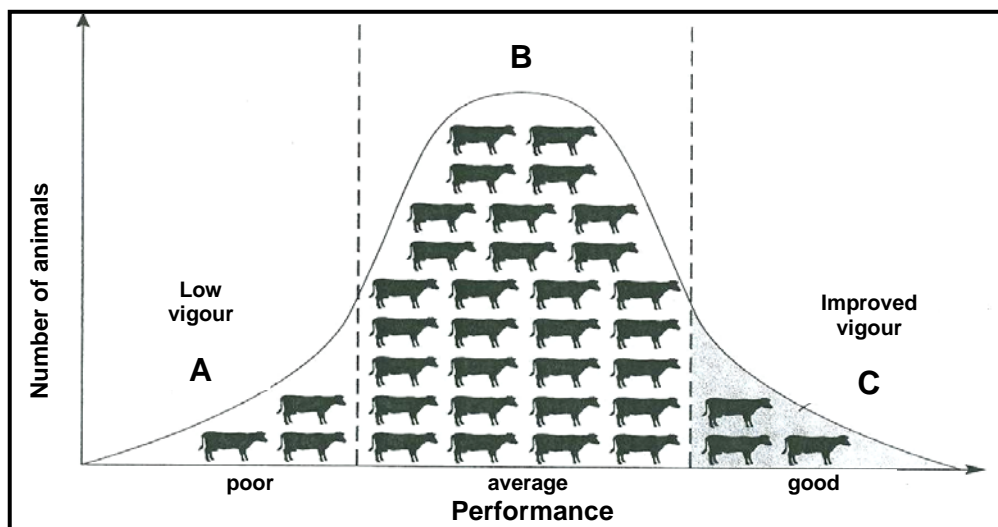
Start this question on a NEW page.

- 4.1 A homozygous dominant ram with long, fine wool is crossed with a homozygous recessive ewe with short, coarse wool.
- 4.1.1 Identify the type of crossing represented by the statement above. (1)
- 4.1.2 Motivate the answer to QUESTION 4.1.1. (2)
- 4.1.3 Determine the phenotypic ratio of the F₂-generation. (1)
- 4.1.4 List the FOUR possible phenotypic combinations as they could appear in the offspring of the crossing above. (4)
- 4.1.5 Explain the economic importance of this crossing. (2)
- 4.2

Genetically modified or altered crops known as GMOs are used for the United Nations' food programme in Africa and Asia. The crops that are most commonly used are maize, rice and potatoes.

- 4.2.1 Define the term *genetic modification*. (2)
- 4.2.2 State THREE advantages of genetically modified crops. (3)
- 4.2.3 Describe TWO potential risks of genetically modified crops. (2)
- 4.2.4 Explain the reason for genetically modifying maize, rice and potatoes. (1)
- 4.2.5 Name TWO techniques used in the genetic modification of plants. (2)

- 4.3 The graph below represents a normal distribution curve used in the selection of animals for a breeding programme by taking only their phenotypic characteristics into account.



- 4.3.1 Deduce, from the graph, the most suitable group of animals (**A**, **B** or **C**) to be used in a breeding programme for the next generation. (1)
- 4.3.2 Give a reason for the answer to QUESTION 4.3.1. (1)
- 4.3.3 Identify the method of selection used in this breeding programme. (1)
- 4.3.4 Differentiate between *selection* and *variation*. (4)
- 4.3.5 Name the selection method used in each of the following situations in animal breeding:
- (a) Selection based on the quality of relatives in the same generation (1)
- (b) Selection based on the quality of offspring (1)
- 4.4 Various breeding programmes/systems are used in animal breeding.
- 4.4.1 Distinguish between *inbreeding* and *crossbreeding*. (2)
- 4.4.2 State TWO advantages of inbreeding. (2)
- 4.4.3 State TWO advantages of a mule to the farmer. (2)

[35]

TOTAL SECTION B: 105
GRAND TOTAL: 150