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NATIONAL SENIOR CERTIFICATE

GRADE 12

SEPTEMBER 2024

AGRICULTURAL SCIENCES P2 MARKING GUIDELINE

MARKS: 150

This marking guideline consists of 9 pages.

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SECTION A

QUESTION 1

1.1	1.1.1	D ✓✓		
	1.1.2	C ✓✓		
	1.1.3	B ✓✓		
	1.1.4	A ✓✓		
	1.1.5	D ✓✓		
	1.1.6	C ✓✓		
	1.1.7	C ✓✓		
	1.1.8	B ✓✓		
	1.1.9	D ✓✓		
	1.1.10	C ✓✓	(10 x 2)	(20)
1.2	1.2.1	E ✓✓		
	1.2.2	A ✓✓		
	1.2.3	G ✓✓		
	1.2.4	C ✓✓		
	1.2.5	D ✓✓	(5 x 2)	(10)
1.3	1.3.1	Monopsony ✓✓		
	1.3.2	Management ✓✓		
	1.3.3	Heritability ✓✓		
	1.3.4	Variation ✓✓		
	1.3.5	Incomplete dominance ✓✓	(5 x 2)	(10)
1.4	1.4.1	Entrepreneurship ✓		
	1.4.2	Movable ✓		
	1.4.3	Monohybrid ✓		
	1.4.4	Translocation ✓		
	1.4.5	Splicing ✓	(5 x 1)	(5)

TOTAL SECTION A: 45

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SECTION B

QUESTION 2: AGRICULTURAL MANAGEMENT AND MARKETING

2.1 **Marketing functions**

2.1.1 (a) Packaging ✓ (1)

(b) Transportation ✓ (1)

2.1.2 **Advantages of processing to customers**

- Added value to farm products ✓
- Processed products will be available throughout the year ✓
- Easier to transport than fresh products ✓
- Provides employment to many people ✓ (Any 2 x 1) (2)

2.1.3 **Reason for grading agricultural products**

- For easy pricing of products ✓
- To provide specific standards for the product ✓ (Any 1 x 1) (1)

2.1.4 **Environmental concerns to consider when designing packaging material:**

- The package must be recyclable ✓
- The package must be biodegradable ✓ (2)

2.2 **Price elasticity**

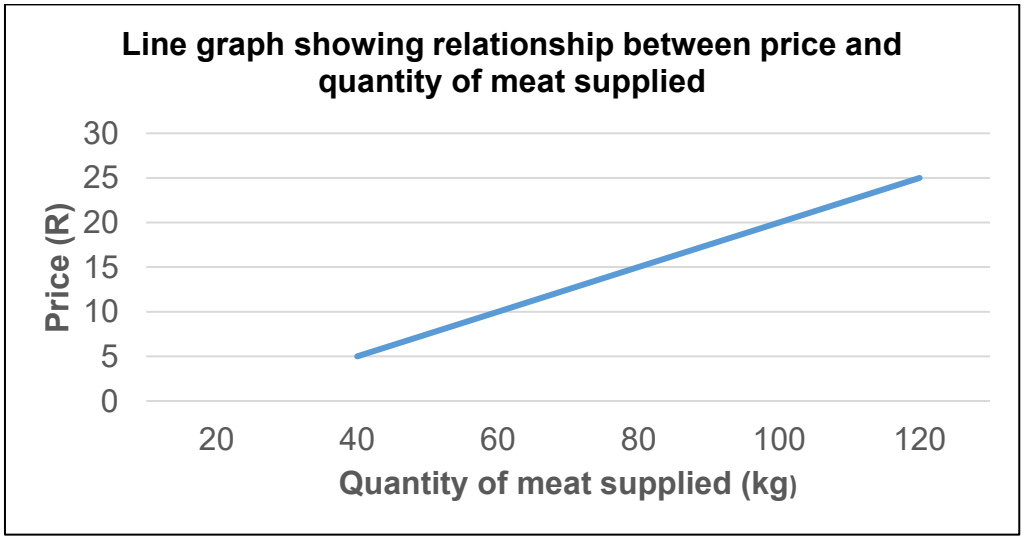
2.2.1 **Economic concept explained by consumer's behaviour**

- Price inelastic ✓ (1)

2.2.2 **TWO factors influencing the price elasticity of a product**

- Nature of the product ✓
- Availability of substitute ✓
- Time period ✓
- Proportion of consumer's budget spent on the item/consumers income ✓ (Any 2 x 1) (2)

2.2.3 **Line graph showing the relationship between price and quantity of meat supplied.**



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Marking guide for the line graph
- Correct caption ✓
- Variable on x-axis correctly labelled and calibrated (Quantity of meat supplied) ✓
- Variable on y-axis correctly labelled and calibrated (Price) ✓
- Units indicated on y-axis and x-axis (R and kg) ✓
- Line graph ✓
- Accuracy ✓ (80% + correctly) (6)

2.2.4 **Relationship between price and quantity supplied**
- The higher the price, ✓ the more goods will be supplied ✓ **OR**
- The lower the price, ✓ the lower goods will be supplied. ✓ (Any 2 x 1) (2)

2.2.5 **Negative effects of environmental conditions on supply:**
When the environmental conditions are not favourable ✓ the supply of the product will decrease. ✓ (2)

2.3 **Marketing approach**

2.3.1 **Advertising in mass marketing is done through.**
- Radio ✓
- TV ✓
- Newspapers ✓ (Any 2 x 1) (2)

2.3.2 **Marketing approach:**
- Multi-segment marketing ✓ (1)

2.3.3 **ONE factor to consider when determining the price of goods and services**
- Demand ✓
- Supply ✓
- Competition ✓
- Cost ✓ (Any 1 x 1) (1)

2.4 **Marketing systems**

2.4.1 **Marketing channel depicted in the picture**
- Farm gate ✓ (1)

2.4.2 **Disadvantages of farm gate to the farmer**
- Volume demanded maybe limited ✓
- The farmer have to receive low local prices ✓
- Farmers may be located far from customers ✓ (Any 2 x 1) (2)

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2.4.3 **TWO measures to streamline and improve the agribusiness chain**

- Improving road infrastructure ✓
- Improving access to market information ✓
- Providing storage facilities ✓
- Providing access to finance ✓
- Grading and standardisation of products ✓
- Processing of products ✓ (Any 2 x 1) (2)

2.4.4 **Principles of agricultural cooperatives**

Anyone willing to participate is allowed membership. ✓✓ (2)

2.5 **Business plan**

2.5.1 **Two reasons for drawing up a business plan**

- To provide direction for the business ✓
- Used to source or secure funds from financial institutions ✓
- To allow performance goals to be set/to guide daily operations ✓
- Used to test feasibility and economic viability of the business ✓
- Allow managers to be aware of all the uncertainties and reduce risks ✓
- To understand marketing opportunities and competitors ✓

(Any 2 x 1) (2)

2.5.2 **Questions used to test feasibility study of the business idea**

- Will there be a market for the goods and services I want to offer? ✓
- Do I have enough skills to start and run the business? ✓
- Do I have enough resources to start and run the business? ✓

(Any 1 x 1) (1)

2.5.3 **Importance of entrepreneurship to the South African economy**

- Promote economic growth ✓
- Promotes development of new and innovative goods and services ✓
- Create job opportunities ✓ (Any 1 x 1) (1)

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QUESTION 3: PRODUCTION FACTORS

3.1 Land as a production factor

3.1.1 Identification of economic characteric of land in the scenario

Availability of agricultural land is limited. ✓ (1)

3.1.2 TWO scientific ways to increase crop yield

- Soil analysis/testing ✓
- Precision farming ✓
- Measuring soil water ✓
- Use of herbicides and pesticides ✓
- Use of improved crop varieties and animal breeds ✓ (Any 2 x 1) (2)

3.1.3 Reasons why agricultural land has a limited production capacity

- Increase in input application result in increase in output ✓ up to a point after which an increase in input application will eventually result in a decrease in output ✓ (2)

3.1.4 TWO economic functions of land

- Land provide space for agricultural activities ✓
- Land provide food for humans and animals ✓
- Land is a source of minerals ✓
- Land provides raw materials ✓
- Land is an asset that the owner can show on a balance sheet ✓

(Any 2 x 1) (2)

3.2 Labour as a production factor

3.2.1 Type of farm workers employed

- Seasonal workers ✓ (1)

3.2.2 TWO causes of movement of farm workers to other industries

- Better working conditions/safe workplace ✓
- Better wages in other industries ✓
- Poor labour management in farms ✓
- Lack of skills and training in farms ✓ (Any 2 x 1) (2)

3.2.3 Types of skilled workers

(a) Semi-skilled ✓ (1)
(b) Skilled ✓ (1)

3.2.4 ONE advantage of mechanisation and technological advances to farmers

- Lower the labour cost of the farming business ✓
- Reduces time needed to complete certain activities ✓ (Any 1 x 1) (1)

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3.2.5 **TWO management aspects that a farmer can apply to ensure that workers finish their tasks on time**
- Setting clear attainable performance goals for workers ✓
- Offer rewarding systems/incentives/recognition of good work/ motivation of workers ✓
- Physical planning ✓
- Daily planning and giving workers more responsibilities ✓
- Supervision and monitoring of tasks and re-evaluation of his staff ✓

(Any 2 x 1) (2)

3.3 **Capital as a production factor**

3.3.1 **Types of capital**
- A: Movable capital ✓
- B: Fixed capital ✓
- C: Working capital/Floating ✓ (3)

3.3.2 **Type of finance needed to purchase capital item A and C**
- A: Medium term credit ✓
- C: Short term credit ✓ (2)

3.3.3 **Problem of capital item A**
- Depreciation ✓ (1)

3.4 **Whole farm budget**

3.4.1 **Two examples of overhead costs**
- Electricity cost ✓
- Water bills ✓
- License cost ✓ (Any 2 x 1) (2)

3.4.2 **Calculation of net farm returns**
- **Net farm returns** = Total gross margins – General costs ✓
  = R54 500,00 – R4 500,00 ✓
  = R50 000,00 ✓ (3)

3.4.3 **Viability of the farm**
- The farm is viable ✓
- **Justification:** The total return from all enterprises is more than the costs. ✓ (2)

3.4.4 **Difference between *cash flow statement* and *income statement:***
- **A cash flow statement** shows flows of cash into and out of the farming operation or farmer's accounting books for a specified period of time. ✓ (1)
- **An income statement** is a financial statement that summarises all income and expenditure for a given time period. ✓ (1)

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3.5 Management

3.5.1 Importance of strategic management skills

- It allows the farm manager to identify business challenges ahead of time ✓
- It allows the farm manager to develop contingency plans ahead of time to deal with adverse conditions. ✓ (Any 1 x 1) (1)

3.5.2 Components of strategic management

- Developing a vision ✓
- Developing a mission ✓
- Setting goals and objectives ✓ (Any 2 x 1) (2)

3.5.3 TWO economic forces

- Inflation rate ✓
- Interest rate and currency exchange rates ✓
- Levels of taxation ✓ (Any 2 x 1) (2)

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QUESTION 4: BASIC AGRICULTURAL GENETICS

4.1 Punnet square

4.1.1 Punnet square to determine the genotype of the cross

♂ \ ♀	B	W
B	BB	BW
W	BW	WW

Marking criteria
- Correct male gametes ✓
- Correct female gametes ✓
- Correct genotype of offspring ✓
- Punnet square populated with gametes and offspring ✓ (4)

4.1.2 Phenotypic ratio
- 1 black : 2 black and white : 1 white ✓ (1)

4.1.3 Calculation of the percentage of F_1 offspring that are hybrids.
- 2/4 x 100 ✓ = 50% ✓ (2)

4.1.4 Type of dominance from the cross above
- Codominance ✓

Justification
- Both traits are equally visible in the phenotype of a heterozygous individual ✓ (2)

4.1.5 Mendel's Laws of Inheritance
(a) Law of Independent Assortment ✓ (1)
(b) Law of Segregation ✓ (1)

4.2 4.2.1 Chromosomes of the male gametes
- 29 autosomes + Y chromosome ✓ and 29 autosomes + X-chromosomes ✓ (2)

4.2.2 Difference between *autosomes* and *gonosomes*
- ***Autosomes*** are chromosomes that do not influence the sex of an organism ✓
- ***Gonosomes*** are the X and Y chromosomes responsible for determination of sex/gender ✓ (2)

4.2.3 Quantitative genes determined by polygenes
- Milk yield/weight gain/growth rate ✓ (1)

4.3 Selection and variation

4.3.1 TWO selection methods used by animal breeders
- Mass selection ✓
- Pedigree selection ✓
- Family selection ✓
- Progeny selection ✓ (Any 2 x 1) (2)

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4.3.2 **Desirable traits which are of economic importance**
- High productivity ✓
- High resistance to diseases and pest attack ✓
- High adaptability to environmental conditions ✓
- High fertility ✓
- High feed conversion and growth rate ✓ (Any 2 x 1) (2)

4.3.3 **Explain how meiosis can cause variation**
- Crossing over that takes place in first meiosis result in homologous chromosomes exchanging genetic material ✓✓ **OR**
- Homologous pairs of chromosomes randomly assort at the equator resulting in variation ✓✓ (2)

4.4 **Breeding systems**

4.4.1 **Breeding systems used by different farmers**
- A: Out crossing ✓
- B: Crossbreeding ✓
- C: Species-crossing ✓
- D: Line breeding ✓ (4)

4.4.2 **Advantages of breeding system A (Out crossing)**
- New breeds can be developed ✓
- Increases genetic diversity and heterozygosity ✓
- Can mask unwanted traits and thus decrease the prevalence of abnormalities in a population ✓ (Any 2 x 1) (2)

4.4.3 **Disadvantages of the inbreeding system**
- Lowers vigour, or viability of the offspring ✓
- Undesirable recessive traits tend to surface/lethal genes ✓
- Inbreeding depression ✓
- Decrease in heterozygosity or variation ✓ (Any 2 x 1) (2)

4.5 **Genetic engineering**

4.5.1 **Equipment used in gene firing**
- Gene gun ✓ (1)

4.5.2 **Name of the organism with altered genes**
- Genetically modified organism/GMO/Transgenic organism ✓ (1)

4.5.3 **A genetic technique that uses electric current to transfer genes.**
- Electroporation ✓ (1)

4.5.4 **Explain how genetically modified crops can assist farmers in reducing production cost:**
- Use of genetically modified crops that are pest and disease resistant ✓
- Reduces the cost of buying pesticides. ✓ (2)

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TOTAL SECTION B: 105
GRAND TOTAL: 150

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