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basic education

Department:
Basic Education
REPUBLIC OF SOUTH AFRICA

SENIOR CERTIFICATE EXAMINATIONS/ NATIONAL SENIOR CERTIFICATE EXAMINATIONS

AGRICULTURAL SCIENCES P2

2023

MARKING GUIDELINES

MARKS: 150

These marking guidelines consist of 10 pages.

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SECTION A

QUESTION 1

1.1	1.1.1	C ✓✓		
	1.1.2	B ✓✓		
	1.1.3	D ✓✓		
	1.1.4	B ✓✓		
	1.1.5	A ✓✓		
	1.1.6	C ✓✓		
	1.1.7	D ✓✓		
	1.1.8	B ✓✓		
	1.1.9	A ✓✓		
	1.1.10	C ✓✓	(10 x 2)	(20)
1.2	1.2.1	C ✓✓		
	1.2.2	E ✓✓		
	1.2.3	B ✓✓		
	1.2.4	G ✓✓		
	1.2.5	A ✓✓	(5 x 2)	(10)
1.3	1.3.1	Promotion/advertising ✓✓		
	1.3.2	Labour productivity ✓✓		
	1.3.3	Quantitative ✓✓		
	1.3.4	Heterozygous ✓✓		
	1.3.5	Environmental ✓✓	(5 x 2)	(10)
1.4	1.4.1	Cooperative ✓		
	1.4.2	Inventory ✓		
	1.4.3	Segregation ✓		
	1.4.4	Natural ✓		
	1.4.5	Heritability ✓	(5 x 1)	(5)

TOTAL SECTION A: 45

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SECTION B

QUESTION 2: AGRICULTURAL MANAGEMENT AND MARKETING

2.1 Marketing channels

2.1.1 **Identification of the following**

(a) Marketing system - Free marketing ✓ (1)

(b) Marketing channel - Direct/contract marketing ✓ (1)

2.1.2 **Indication of the letter**

(a) D ✓ (1)

(b) B ✓ (1)

2.1.3 **TWO disadvantages of a free marketing system**

- Farmers are likely to experience price fluctuations ✓
- High marketing/production costs ✓
- The producer has a limited bargaining power ✓
- The producer runs a risk because wrong production decisions may lead to a greater financial loss ✓
- Producers may set the price artificially ✓
- There is a risk of product rejection if it is not accepted by consumers ✓
- Cartels are formed and consumers/other suppliers are exploited ✓
- Over production can lead to big surplus ✓
- Farmers may lack the necessary skills ✓
- Farmers bear all the risk alone ✓
- Small scale farmers struggle to keep up production as they focus on marketing ✓
- Competition is high for individual farmers ✓ (Any 2) (2)

2.2 Price elasticity and inelasticity

2.2.1 **Identification of the product**

(a) Inelastic - Product B ✓ (1)

(b) Elastic - Product A ✓ (1)

2.2.2 **Reason for inelasticity**

The change in price ✓ has little influence on the quantity of product demanded ✓ (2)

2.2.3 **TWO factors that resulted in price elasticity of product**

- Nature of the product ✓
- Availability of substitute products ✓
- Consumers income ✓
- Fuel costs ✓
- Time period/seasonality ✓
- Price ✓ (Any 2) (2)

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2.3 **Marketing problems**

2.3.1 **Deduction of the problem**

(a) Picture A - Wide distribution of production areas and distance to markets/poor infrastructure/accidents/theft/delays/ transportation costs ✓ (1)

(b) Picture B - Perishability/spoilage/storage costs ✓ (1)

2.3.2 **How the problem of transportation can be addressed**

- Improving road infrastructure ✓
- Provision of security ✓
- Insurance ✓
- Production closer to markets ✓ (Any 1) (1)

2.3.3 **Cost factor aligned to picture B**

Supply of energy/electricity/storage costs ✓ (1)

2.3.4 **TWO roles of legislation in the effective marketing**

- Promoting/optimising efficient marketing of products ✓
- Increasing market accessibility to all participants ✓
- Enhancing the viability of agricultural sector ✓
- Controls the sale and export of certain agricultural products✓
- Promotes meat safety at abattoirs ✓
- Controls the export of perishable products from South Africa ✓
- Promotes a fair/sustainable market place for consumer products and services ✓ (Any 2) (2)

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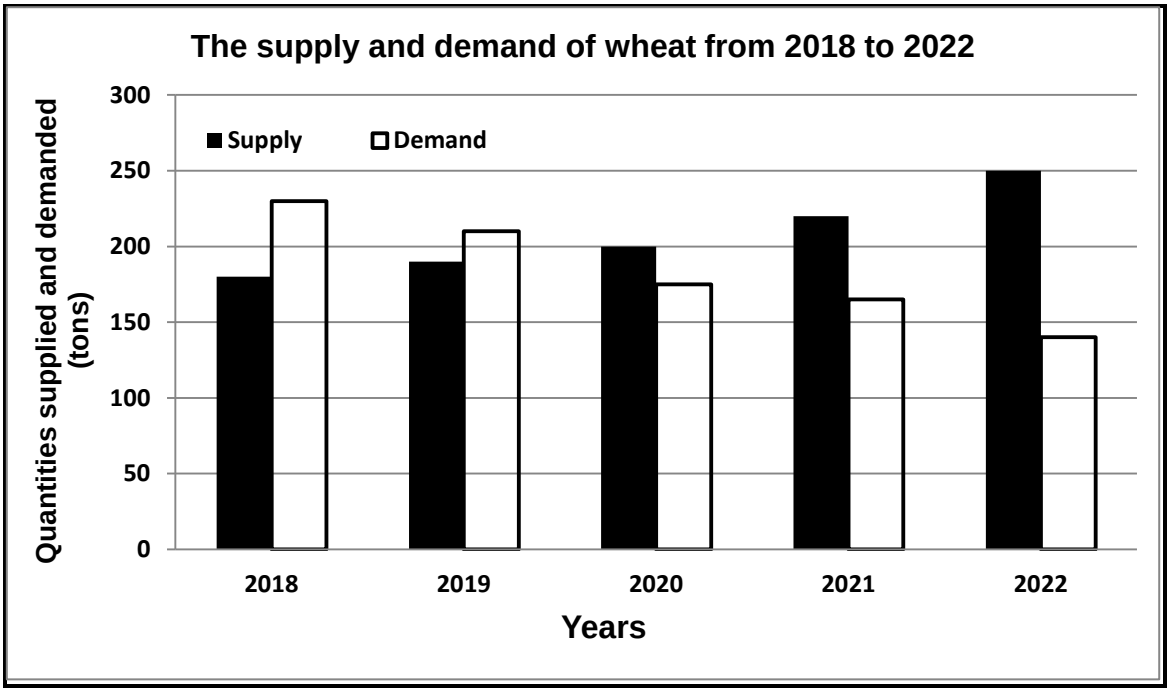
2.4 **Supply and demand of wheat**

2.4.1 **A bar graph showing the supply and demand of wheat from 2018 to 2022**



CRITERIA/RUBRIC/MARKING GUIDELINES

- Correct heading ✓
- X-axis: correctly calibrated with label (Years) ✓
- Y-axis: correctly calibrated with label (Quantities supplied and demanded) ✓
- Correct unit (tons) ✓
- Bar graph ✓
- Accuracy (80% + correctly plotted) ✓ (6)

2.4.2 **Deduction of trends**

(a) Supply - Quantities supplied increased from 180 tons (2018) to 250 tons (2022) ✓ (1)

(b) Demand - Quantities demand decreased from 230 tons (2018) to 140 tons (2022) ✓ (1)

2.5 **Entrepreneurship**

2.5.1 **TWO phases of entrepreneurship in the scenario**

- Identification of a business opportunity ✓
- Determining the resources required/resource mobilization ✓
- Starting the business ✓ (Any 2) (2)

2.5.2 **Marketing function**

Processing ✓ (1)

2.5.3 **Advantage of processing**

It provides job/skill opportunities ✓ (1)

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2.6 **SWOT analysis**

2.6.1 **Purpose of SWOT analysis**
It helps to evaluate the business ✓ (1)

2.6.2 **Identification of the letter**
(a) C ✓ (1)
(b) B ✓ (1)
(c) A ✓ (1)
(d) D ✓ (1)
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QUESTION 3: PRODUCTION FACTORS

3.1 **Production factors**

3.1.1 **The production factor**
(a) Land/C ✓ (1)
(b) Capital/A ✓ (1)
(c) Management/B ✓ (1)

3.1.2 **Justification of the answer in 3.1.1 (a)**
- The value of land appreciates ✓
- Easy to sell/transfer/convert ✓ (Any 1) (1)

3.2 **Land**

3.2.1 **The economic characteristic of land**
Land for agricultural purposes is scarce/limited/limitedness ✓ (1)

3.2.2 **TWO functions associated with land**
- Provides space for agricultural production/activities ✓
- Provides food for humans/feeding for animals ✓ (2)

3.3 **HIV/AIDS and its negative impact on productivity**

3.3.1 **TWO implications of HIV/AIDS on the agricultural sector**
- Productivity will decrease ✓
- Knowledge/experience/skills are lost ✓
- Makes planning difficult ✓ (Any 2) (2)

3.3.2 **A measure that can be taken by a farmer to address HIV/AIDS**
- Awareness campaigns/education ✓
- Access to anti-retroviral medication ✓
- Access to treatment to STD's ✓
- Education in acceptable moral behaviour ✓
- Access to condoms ✓
- Establish support groups ✓ (Any 1) (1)

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3.4 **Labour**

3.4.1 **The types of farm workers**

(a) **Casual worker -** Brick-layer ✓ (1)
(b) **Manager -** Dairy foreman ✓ (1)
(c) **Unskilled worker -** General workers ✓ (1)
(d) **Skilled worker -** Electronic feeding machine operator/brick layer ✓ (1)

3.4.2 **The legislation/Act that regulates the following**

(a) Compensation for Occupational Injuries and Diseases Act/COIDA (Act 130 of 1993) ✓ (1)
(b) Unemployment Insurance Act/UIA (Act 66 of 2001) ✓ (1)
(c) Basic Conditions of Employment Act/BCEA (Act 75 of 1997) ✓ (1)

3.5 **Budget**

3.5.1 **The type of budget**

Enterprise budget ✓ (1)

3.5.2 **Calculation of the profit/loss**

Profit/loss = Total income **–** Total expenditure ✓
R197 500 ✓ **–** R143 500 ✓
= R54 000 ✓ (4)

3.5.3 **Indication of whether the farmer should continue or not with the enterprise**

The farmer should continue ✓ (1)

3.5.4 **Reason for the answer**

The enterprise made a profit of R54 000 ✓ (1)

3.6 **Capital**

3.6.1 **Identification of the curves**

(a) **Movable capital assets -** A ✓ (1)
(b) **Fixed capital assets -** B ✓ (1)

3.6.2 **Reason**

The value of the fixed assets appreciates ✓ (1)

3.6.3 **TWO problems of capital**

- Depreciation ✓
- Scarcity/shortage of capital ✓
- Expensive/high cost ✓
- Over-capitalization ✓
- Under-capitalization ✓
- Risk factor ✓
- High interest rate/interest rate may change ✓ (Any 2) (2)

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3.7 **Management**

3.7.1 **TWO types of risks**
- Internal ✓
- External ✓ (2)

3.7.2 **TWO sources of risks**
- Technical risks ✓
- Market and price risks ✓
- Financial risks ✓
- Legal risks ✓
- Production risks ✓ (Any 2) (2)

3.7.3 **TWO risk management strategies**
- Diversification ✓
- Risk sharing ✓ (2)

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QUESTION 4: BASIC AGRICULTURAL GENETICS

4.1 **Crossing**

4.1.1 **The pattern of inheritance**
Incomplete dominance ✓ (1)

4.1.2 **Justification**
The F_1 offspring have intermediate characteristic ✓ (1)

4.1.3 **Labelling**
(a) 1 - Meiosis ✓ (1)
(b) 2 - BW ✓ (1)
(c) 3 - Black ✓ (1)

4.1.4 **F_1 and F_2 ratio's**
(a) Genotypic ratio - 1 or 4 ✓ (1)
(b) Phenotypic ratio - 1 black **:** 2 grey **:** 1 white ✓ (1)

4.2 **Variation**

4.2.1 **Identification of the phenomenon**
Variation ✓ (1)

4.2.2 **THREE environmental causes of variation**
- Nutrition ✓
- Rainfall/water supply ✓
- Soil factors ✓
- Temperature ✓
- Topography ✓
- Light intensity ✓
- Diseases/pests ✓ (Any 3) (3)

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4.3 **Matching of the mutagenic agents**

(a) Chemical ✓ (1)
(b) Physical ✓ (1)
(c) Biological ✓ (1)

4.4 **Selection and breeding**

4.4.1 **Indication of the most accurate method**
Pedigree selection ✓ (1)

4.4.2 **ONE other method to select animals**
- Mass selection ✓
- Progeny selection ✓
- Family selection ✓ (Any 1) (1)

4.4.3 **ONE importance of variation**
- Variation is the basis for selection ✓
- Helps animals to adapt to the changing environment ✓
- Used to improve crop varieties and livestock breeds ✓
- For the development of new cultivars/breeds ✓ (Any 1) (1)

4.4.4 **Differentiation between inbreeding and cross-breeding**
- Inbreeding is the crossing of closely related animals ✓
- Cross-breeding is the crossing of non-related animals ✓ (2)

4.5 **Punnett Square**

4.5.1

Gametes	B	b
b	Bb	bb
b	Bb	bb

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- Correct gametes of parent one ✓
- Correct gametes of parent two ✓
- Correct genotypes of the offspring ✓
- Punnet Square (populated with gametes and offspring) ✓ (4)

4.5.2 **Calculation of the percentage of black-furred goats**
- = $\frac{2}{4} \times 100$ ✓
- = 50% ✓ (2)

4.6 **Patterns of inheritance**

4.6.1 **The pattern of inheritance**
Polygenic inheritance ✓ (1)

4.6.2 **Reason**
The length of mohair is controlled by more than one pair of genes ✓ (1)

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4.6.3 **Calculation of the length of mohair**

- AABb length = 25 cm+3 cm + 3 cm + 3 cm ✓
- = 34 cm ✓ (2)

4.6.4 **Another genotype that gives rise to 34 cm**

AaBB ✓ (1)

4.7 **Genetic modification**

4.7.1 **Definition**

Genetic modification is the technique of changing/manipulation of the genetic characteristics of an organism ✓ by inserting the genes from another organism into its DNA ✓ (2)

4.7.2 **TWO aims of genetic modification**

- Improving the yield ✓
- Improve the tolerance to environmental conditions ✓
- Improve the resistance to pests, diseases and weeds ✓
- Improve the flavour and shelf-life of produce ✓
- Increasing the nutritional value of crops/animal products ✓
- Producing pharmaceutical crops/develop new vaccines/medicines ✓
- Develop animal models for studies of diseases ✓
- Increasing genetic diversity ✓ (Any 2) (2)

4.7.3 **ONE advantage of genetic modification over traditional method**

- It is precise ✓
- It is fast ✓
- Not limited to organisms of the same species ✓ (Any 1) (1)

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TOTAL SECTION B: 105
GRAND TOTAL: 150

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