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SENIOR CERTIFICATE/ NATIONAL SENIOR CERTIFICATE

GRADE 12

AGRICULTURAL SCIENCES P2

NOVEMBER 2020

MARKING GUIDELINES

MARKS: 150

These marking guidelines consist of 10 pages.

SECTION A**QUESTION 1**

1.1	1.1.1	D ✓✓		
	1.1.2	B ✓✓		
	1.1.3	A ✓✓		
	1.1.4	C ✓✓		
	1.1.5	B ✓✓		
	1.1.6	A ✓✓		
	1.1.7	C ✓✓		
	1.1.8	A ✓✓		
	1.1.9	B ✓✓		
	1.1.10	B ✓✓	(10 x 2)	(20)
1.2	1.2.1	C ✓✓		
	1.2.2	A ✓✓		
	1.2.3	B ✓✓		
	1.2.4	D ✓✓		
	1.2.5	G ✓✓	(5 x 2)	(10)
1.3	1.3.1	Market equilibrium ✓✓		
	1.3.2	Casual/temporary ✓✓		
	1.3.3	Genetic modification/Genetic engineering/manipulation ✓✓		
	1.3.4	Species crossing ✓✓		
	1.3.5	Heritability ✓✓	(5 x 2)	(10)
1.4	1.4.1	Green/eco/sustainable agricultural marketing ✓		
	1.4.2	Contract ✓		
	1.4.3	Family ✓		
	1.4.4	Estimated breeding value/EBV ✓		
	1.4.5	Prepotency ✓	(5 x 1)	(5)

TOTAL SECTION A: 45

SECTION B**QUESTION 2: AGRICULTURAL MANAGEMENT AND MARKETING****2.1 Functions of marketing****2.1.1 Identification of the marketing function****B** - Transportation ✓

(1)

C - Packaging ✓

(1)

2.1.2 TWO guidelines of packaging

- Provide information about the product/identification ✓
- Convenient for handling/containment ✓
- Biodegradable/recyclable ✓
- Free from chemicals/foreign objects ✓
- Protection against mechanical damage ✓

(Any 2)

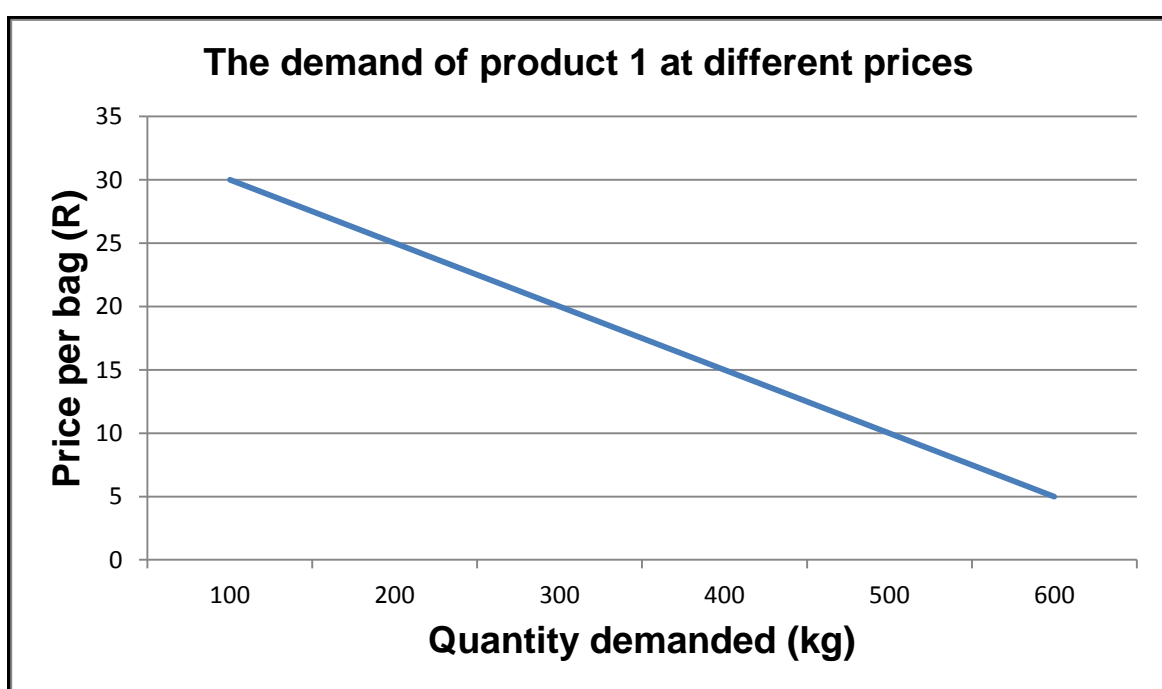
(2)

2.1.3 TWO advantages of processing

- Increases the value of the product ✓
- Overcome over-supply of the product ✓
- Allows easier packaging and handling of product/ easy to transport/convenience ✓
- Provide job opportunities ✓
- Ensures the availability of product throughout the year ✓
- Reduces spoilage/perishability/longer shelf life ✓
- Ensures food security ✓
- Improved food safety ✓
- Makes the products more appealing to the consumer ✓

(Any 2)

(2)

2.2 2.2.1 Line graph

Criteria/rubric/marketing guideline

- Correct heading ✓
- X-axis: Correctly calibrated with label (Quantity demanded) ✓
- Y-axis: Correctly calibrated with label (Price per bag) ✓
- Line graph ✓
- Correct units (R and kg) ✓
- Accuracy ✓ (6)

2.2.2 Identification of the product reflecting law of demand

Product 1 ✓ (1)

2.2.3 Justification

The lower the price, the higher the demand ✓

OR

The higher the price, the lower the demand ✓ (Any 1) (1)

2.2.4 Indication of the form of elasticity

PRODUCT 1 - Price elasticity of demand ✓ (1)

PRODUCT 2 - Price inelasticity of demand ✓ (1)

2.2.5 Reason

PRODUCT 1 - Demand changed drastically with change in price ✓ (1)

PRODUCT 2 - Demand remained high/constant despite the change in price ✓ (1)

2.3 Free market system**2.3.1 Advantage of a free marketing system to the consumer**

- Consumer can benefit from better quality products/ fresh produce ✓
- Consumer can bargain through negotiating price ✓
- Consumer can buy wherever they want ✓
- Produce are cheaper as there is no intermediaries ✓ (Any 1) (1)

2.3.2 TWO disadvantages of free marketing system for the producer

- Greater price fluctuation ✓
- High market costs as marketing takes place on a small scale ✓
- Time is spent on marketing/producer responsible for marketing ✓
- Limited bargaining power/the producer acts as an individual ✓
- Smaller profit if the agent is not fully active ✓
- Greater financial loss if wrong decisions are made ✓
- Highly competitive ✓
- Risk/theft ✓ (Any 2) (2)

2.3.3 TWO free marketing channels

- Farm gate marketing ✓
- Fresh produce markets ✓
- Stock sales/auction ✓
- Direct/contract marketing ✓
- Internet marketing ✓ (Any 2) (2)

2.4 Marketing chain

- 2.4.1 **Identification of the marketing chain**
Supply/Agri-business chain ✓ (1)
- 2.4.2 **Factor that may hamper the marketing at stage E**
- Spoilage/perishability/lack of storage facilities ✓
 - Accidents/theft ✓ (Any 1) (1)
- 2.4.3 **TWO ways to improve agri-business chain**
- Improving road infrastructure ✓
 - Improving access to market information ✓
 - Providing storage facilities to prevent oversupply ✓
 - Processing products close to where they are produced to reduce transportation costs ✓
 - Use of refrigerated transport to prevent spoilage/perishability ✓
 - Provision of access to finance ✓
 - Grading/standardisation ✓
 - Collective marketing ✓ (Any 2) (2)

2.5 Entrepreneurship

- 2.5.1 **Personal characteristics of an entrepreneur**
- (a) - Innovation ✓ (1)
 - (b) - Interpersonal skill ✓ (1)
 - (c) - Perseverance ✓ (1)
 - (d) - Risk taking ✓ (1)
- 2.5.2 **TWO phases of entrepreneurial process**
- Identification of the business opportunities ✓
 - Evaluating the opportunity ✓
 - Developing a business plan/planning ✓
 - Resource mobilization ✓
 - Starting and managing the business ✓ (Any 2) (2)
- 2.5.3 **TWO problems of drawing up a business plan**
- Incomplete/incorrect financials details ✓
 - Vague business plan ✓
 - Unrealistic assumptions/over ambitiousness ✓
 - Ignore risks/hiding weaknesses ✓
 - Not highlighting potential competitors/competition ✓
 - Who and where are the suppliers ✓
 - Leaving gaps/leaving out technical details ✓
 - Using the incorrect format ✓
 - Insufficient research ✓ (Any 2) (2)
- [35]**

QUESTION 3: PRODUCTION FACTORS**3.1 Capital**

- 3.1.1 **Identification of the type of credit**
Long-term credit ✓ (1)
- 3.1.2 **Explanation of long-term credit**
- Used to buy fixed capital assets ✓
 - Repayable over a period of 10 - 30 years ✓
 - At a lower interest rate ✓
 - Offered by the financial institutions/Land Bank ✓ (Any 2) (2)
- 3.1.3 **Problems related to capital**
- Capital is scarce ✓
 - Total amount due is high/capital is expensive ✓
 - High risk factor ✓ (Any 2) (2)
- 3.1.4 **TWO other ways of creating capital**
- Savings ✓
 - Production/sales ✓
 - Grants ✓
 - Inheritance ✓
 - Gifts/donation/lottery ✓
 - Potential investors/business partners ✓ (Any 2) (2)

3.2 Management

- 3.2.1 **Definition of management**
The effective combination/coordination of resources ✓
to achieve a specific goal/maximise profit ✓ (2)
- 3.2.2 **THREE main components of management**
- Set goals ✓
 - Planning ✓
 - Organising/coordination/implementation ✓
 - Directing/leading ✓
 - Control/monitoring/supervision ✓
 - Decision making ✓
 - Communication ✓ (Any 3) (3)

3.3 External forces that effect a business

- 3.3.1 Economic forces ✓ (1)
- 3.3.2 Legal forces ✓ (1)
- 3.3.3 Socio-cultural forces ✓ (1)
- 3.3.4 Environmental forces ✓ (1)
- 3.3.5 Technological forces ✓ (1)

3.4 Labour legislation

- 3.4.1 THREE aspects in the contract of a farm worker**
- Details of the employee ✓
 - Leave ✓
 - Working hours ✓
 - Working on Sundays/public holidays ✓
 - Daily and weekly rest periods/meal intervals ✓
 - Deductions ✓
 - Wages/pay slip/method of payment/allowance ✓
 - Overtime ✓
 - Termination of employment ✓
 - Job description ✓
- (Any 3) (3)
- 3.4.2 Indication of the legislations**
- (a) Occupational Health and Safety Act (Act 85 of 1993) ✓ (1)
- (b) Labour Relations Act (Act 66 of 1995) ✓ (1)

3.5 Land

- 3.5.1 Indication of an economic characteristic of land represented**
- Land cannot be destroyed/indestructibility ✓ (1)
- 3.5.2 Other THREE economic characteristic of land**
- Land is subject to the law of diminishing returns ✓
 - Land is durable ✓
 - Land can be bought/sold/has value ✓
 - Good agricultural land is limited ✓
 - Land is found in a specific environment ✓
 - Available agricultural land is limited/availability ✓
 - Differences with regard to production potential/restrictedness ✓
 - The value of land appreciates over time ✓
 - It is a passive factor of production ✓
 - It is a primary factor of production ✓
- (Any 3) (3)
- 3.5.3 TWO methods to improve land productivity**
- Water supply/provision ✓
 - Farming land more efficiently/
consolidation of uneconomic farm units ✓
 - Improving soil fertility/restoring land potential ✓
 - Changing cropping practices and farming systems
 - Use of scientific farming methods ✓
- (Any 2) (2)

3.6 Budget

- 3.6.1 Identification of**
- (a) **Fixed costs** - Insurance ✓ (1)
- (b) **Variable costs** - Feed/sawdust/electricity/water/vaccines/
broilers/wages ✓ (Any 1) (1)

3.6.2 Calculation of a profit/loss

$$\begin{aligned}
 \text{Profit/loss} &= \text{Total Income} - \text{Total Expenditure} \checkmark \\
 &= \text{R}83\,450 - \text{R}56\,400 \checkmark \\
 &= \text{R}27\,050 \checkmark \\
 &\text{OR} \\
 &= \text{R}83\,450 \checkmark - \text{R}56\,400 \checkmark \\
 &= \text{R}27\,050 \checkmark
 \end{aligned}$$

(3)

3.6.3 TWO types of budget

- Whole farm budget ✓
- Enterprise budget ✓
- Partial budget ✓

(Any 2)

(2)

[35]**QUESTION 4: BASIC AGRICULTURAL GENETICS****4.1 Monohybrid crossing****4.1.1 Determination of the female genotype**

bb ✓

(1)

4.1.2 Punnet square

♂ \ ♀	b	b
B	Bb	Bb
b	Bb	bb

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- Correct male gametes ✓
- Correct offspring ✓
- Punnet square with gametes and offspring ✓
- All the offspring are black ✓

(4)

4.1.3 Identification of the type of dominance

Complete dominance ✓

(1)

4.1.4 Reason

Black colour is dominant over white colour/white colour is recessive to black colour/one allele masks/over shadows the other ✓

(1)

4.2 Dihybrid crossing**4.2.1 Identification of the type of crossing**

Dihybrid crossing ✓

(1)

4.2.2 REASON

This crossing involves two different characteristics/colour and shape ✓

(1)

- 4.2.3 **ONE of the offspring which is different from that of parents**
- BBRr ✓
 - BBRR ✓
 - BbRR ✓
- (Any 1) (1)
- 4.3 **Pedigree diagram**
- 4.3.1 **Indication of homozygous or heterozygous**
Homozygous ✓ (1)
- 4.3.2 **Reason to motivate for homozygous**
Similar alleles ✓ (1)
- 4.3.3 **Determination of**
- (a) **F₂ phenotype:** 1 red : 2 pink : 1 white ✓ (1)
 - (b) **Percentage of red offspring - 25%** ✓ (1)
- 4.4 **Variation**
- 4.4.1 **Indication of the genetic phenomenon**
Variation ✓ (1)
- 4.4.2 **Definition of the genetic phenomenon**
- The difference that occurs amongst individuals ✓ of the same species ✓
 - Difference in the genotype and phenotype ✓ of the same species ✓
- (Any 1) (2)
- 4.4.3 **THREE environmental factors**
- Soil factors ✓
 - Temperature ✓
 - Light intensity ✓
 - Diseases and pests ✓
 - Moisture/water content ✓
 - Topography ✓
 - Nutrition ✓
- (Any 3) (3)
- 4.4.4 **Scientific term for the improvement**
Heterosis/hybrid vigour ✓ (1)
- 4.4.5 **The type of breeding system**
Cross breeding ✓ (1)
- 4.5 **Polygenic inheritance**
- 4.5.1 **Definition of polygenic inheritance**
Characteristic that is determined ✓ by many different genes ✓ (2)
- 4.5.2 **Determination of the height of an AABB**
30 cm + 10 cm + 10 cm + 10 cm + 10 cm ✓
= 70 cm ✓ (2)

4.5.3 THREE different genotypes of a 50 cm tomato plant

- AAbb ✓
- aaBB ✓
- AaBb ✓

(3)

4.6 Genetic modification**4.6.1 TWO techniques that can be used to modify plants**

- Agro-bacterium tumefaciens/bacterial carriers ✓
- Viral carriers ✓
- Biolistic ✓
- Calcium phosphate precipitation ✓
- Electroporation ✓
- Gene slicing ✓
- Gene silencing ✓
- Lipofection ✓
- Micro-injection ✓
- Chemicalporation ✓

(Any 2) (2)

4.6.2 TWO advantages of GM crops

- Improving the shelf life of produce ✓
- Improving the nutritional value of food ✓
- More resistance to insects/pests/diseases ✓
- Resistance to weed killers ✓
- More resistance to adverse environmental influences/factors ✓
- Increased yield ✓

(Any 2) (2)

4.6.3 TWO disadvantages of GM crops

- Health risks ✓
- Environmental risks ✓
- Personal/ethical/socio-cultural concerns ✓
- Reduced biodiversity ✓
- Socio-economic risks/expensive to emerging farmers ✓ Any 2)

(2)
[35]

TOTAL SECTION B: 105
GRAND TOTAL: 150