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basic education

Department:
Basic Education
REPUBLIC OF SOUTH AFRICA

NATIONAL SENIOR CERTIFICATE

GRADE 12

AGRICULTURAL SCIENCES P2

NOVEMBER 2021

MARKING GUIDELINES

MARKS: 150

These marking guidelines consist of 10 pages.

SECTION A**QUESTION 1**

1.1	1.1.1	D ✓✓		
	1.1.2	A ✓✓		
	1.1.3	C ✓✓		
	1.1.4	B ✓✓		
	1.1.5	D ✓✓		
	1.1.6	B ✓✓		
	1.1.7	A ✓✓		
	1.1.8	C ✓✓		
	1.1.9	C ✓✓		
	1.1.10	B ✓✓	(10 x 2)	(20)
1.2	1.2.1	E ✓✓		
	1.2.2	H ✓✓		
	1.2.3	D ✓✓		
	1.2.4	A ✓✓		
	1.2.5	B ✓✓	(5 x 2)	(10)
1.3	1.3.1	Green marketing ✓✓		
	1.3.2	Capital ✓✓		
	1.3.3	Pedigree ✓✓		
	1.3.4	Species crossing ✓✓		
	1.3.5	Breeding value ✓✓	(5 x 2)	(10)
1.4	1.4.1	Farm gate ✓		
	1.4.2	Short term ✓		
	1.4.3	Lipofection ✓		
	1.4.4	Co-dominance ✓		
	1.4.5	Polygenes ✓	(5 x 1)	(5)
TOTAL SECTION A:				45

SECTION B**QUESTION 2: AGRICULTURAL MANAGEMENT AND MARKETING****2.1 Marketing functions****2.1.1 The marketing functions****A** - Transportation ✓ (1)**D** - Processing/value adding ✓ (1)**2.1.2 TWO guidelines for packaging**

- Product identification ✓
- Recyclability/biodegradability ✓
- Containment ✓
- Protection ✓
- Easy handling/convenience ✓
- Health risks ✓
- Improving shelf life of the product ✓
- Must be appropriate to target market ✓

(Any 2) (2)

2.1.3 THREE factors hampering the marketing of agricultural products

- Poor infrastructure ✓
- Lack of capital ✓
- Perishability of agricultural products ✓
- Risks/accidents/theft/spoilage ✓
- Ineffective control of production ✓
- Seasonal fluctuations in production ✓
- Wide distribution of the product and distance to the market ✓
- Low value in relation to volume
- Standardization of products ✓
- High marketing/intermediaries/transport costs ✓
- Legislation/strict marketing laws/export regulations ✓

(Any 3) (3)

2.2 Marketing type**2.2.1 The type of marketing system**

Co-operative marketing ✓ (1)

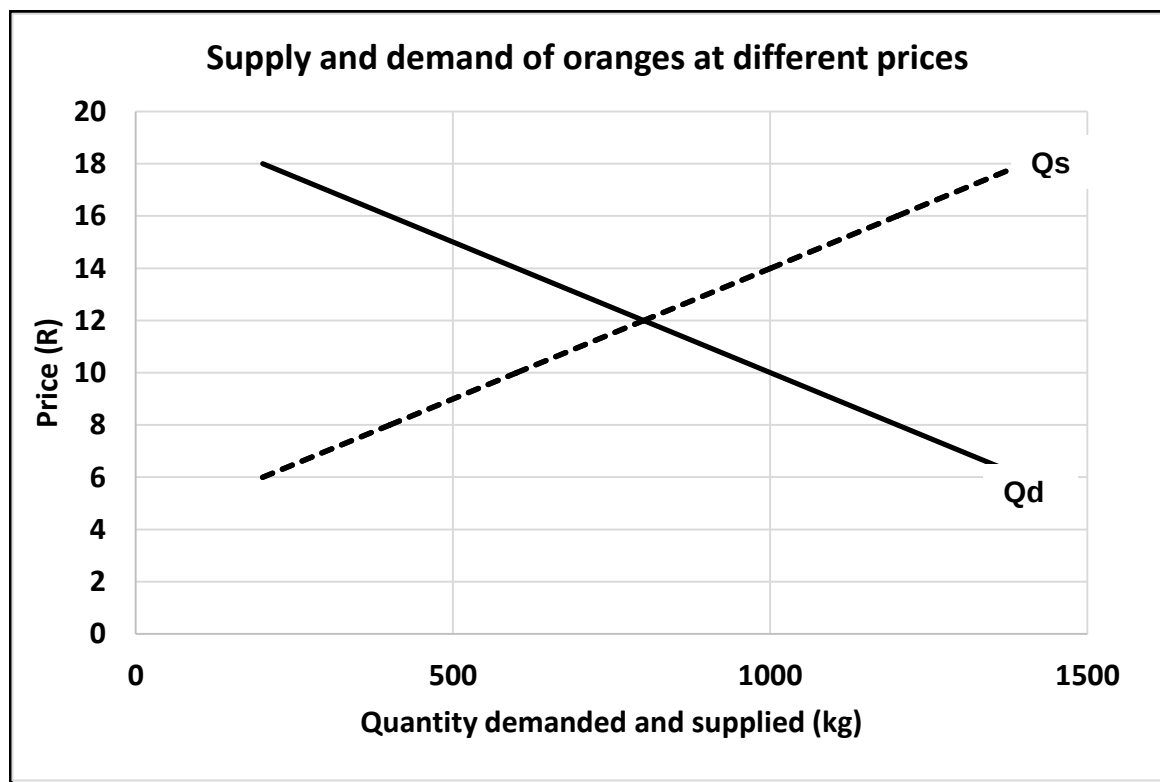
2.2.2 TWO principles of co-operative marketing

- Voluntary and open membership ✓
- Democratic member control ✓
- Co-operation among members ✓
- Members provided with education, training and information ✓
- Autonomy and independence ✓
- Each member has a single vote ✓
- Members contribute money equally ✓
- Members are paid dividends ✓
- Products are standardized ✓
- Take care/concern for the community ✓
- Risk is shared by all members ✓
- Only members may deliver products ✓

(Any 2) (2)

2.2.3 Explanation of the benefits of co-operative marketing

- (a) Members of the co-operative save a lot of money ✓ by marketing as a group through a pool system ✓ **OR** Members buy in bulk ✓ at cheaper prices ✓ (Any 1) (2)
- (b) The co-operative negotiates better prices ✓ on behalf of its members ✓ (2)

2.3 Supply and demand of oranges at different prices**2.3.1 Line graph****CRITERIA/RUBRIC/MARKING GUIDELINES**

- Correct heading ✓
- X-axis: Correctly calibrated and labelled (Quantity) ✓
- Y-axis: Correctly calibrated and labelled (Price) ✓
- Correct units (R and kg) ✓
- Line graph ✓
- Accuracy ✓ (6)

2.3.2 Identification of the price

- (a) Highest shortage - R6 ✓ (1)
- (b) Lowest surplus - R14 ✓ (1)

2.3.3 The equilibrium price

R12 ✓ (1)

2.4 Elasticity of demand and supply**2.4.1 Identification of**

- (a) Price elasticity of supply - Graph B ✓ (1)
- (b) Price inelasticity of demand - Graph A ✓ (1)

2.4.2 Reason for the answer in

(a) A small change in price resulted in a huge change in the quantity supplied ✓ (1)

(b) The huge change in price resulted in very little change in the quantity demanded ✓ (1)

2.4.3 TWO factors that affect demand

- Availability of substitute products ✓
- Price of complimentary and competing products ✓
- Research ✓
- Fashion ✓
- Quality of the product ✓
- Consumer preferences/tastes ✓
- Festive seasons ✓
- Usefulness of the product ✓
- Number of consumers ✓
- Legislation ✓
- Advertising of the product ✓
- Price of the product/price expectations ✓
- Income/buying power/socio-economic circumstances of the consumers ✓ (Any 2) (2)

2.5 Scenario**2.5.1 Justification of the statement**

The young farmer took an initiative to organise a farming business from the gift with its risks to make profit ✓ (1)

2.5.2 TWO entrepreneurial success factors

- Initiative/creative/innovative ✓
- Confidence ✓
- Perseverance ✓
- Market driven ✓
- Communication/interpersonal skills/relations ✓
- Vision ✓
- Hard-working/commitment ✓
- Courage/motivation/positive attitude ✓
- Risk taking ✓
- Achievement ✓
- Knowledge/skills ✓ (Any 2) (2)

2.5.3 Identification of**(a) TWO strengths for the farming business**

- Possesses a lot of success factors ✓
- Owns 1 790 hectares of land ✓
- Achieved 98% calving rate ✓
- Permanent workers ✓
- The farmer is young and energetic ✓ (Any 2) (2)

(b) ONE threat to the business

Farming in dry arid region ✓ (1)

[35]

QUESTION 3: PRODUCTION FACTORS**3.1 Land****3.1.1 Deduction of the****(a) Economic characteristic of land**

Availability of land is limited ✓

(1)

(b) Function of land as a production factor

• Land provides space ✓

• Land provides food ✓

(Any 1)

(1)

3.1.2 Reason

(a) Arable land was 70 hectares in 1970 and decreased over years to only 10 hectares in 2020 ✓

(1)

3.1.3 TWO functions of land

• Land is a source of raw materials ✓

• Land is a source of minerals ✓

• Land is an asset/serves as collateral ✓

(Any 2)

(2)

3.1.4 TWO methods to improve land productivity

• Improve soil fertility ✓

• Improve water management/water supply ✓

• Restoring land potential ✓

• Changing cropping practices and farming systems ✓

• Farming land more efficiently/precision farming ✓

• Consolidating small uneconomical land units ✓

(Any 2)

(2)

3.2 Labour**3.2.1 TWO main types of farm labourers**

• Permanent/full-time ✓

• Temporary/part-time ✓

(2)

3.2.2 Identification of tasks**(a) Casual labourers** - Fencing ✓

(1)

(b) Seasonal labourers - Harvesting ✓

(1)

3.2.3 Labour problem

• Lack of skills/training ✓

• Scarcity of labour ✓

• Covid-19 ✓

(Any 1)

(1)

3.2.4 Method to address lack of skills

• Training labourers/employment of skilled labour ✓

• Employment of additional workers/improving working conditions ✓

• Vaccination/enforcing all Covid-19 protocols ✓

(Any 1)

(1)

3.3 Conditions of employment in FARM A and FARM B**3.3.1 Unfair conditions of employment****FARM A - Labourer ✓****(1)****3.3.2 TWO reasons to support the answer**

- Low rate per day ✓
- Longer working hours ✓
- Fewer leave days/year ✓
- Lower overtime payment in comparison with labourer B ✓

(Any 2) (2)**3.3.3 Labour Legislation Act that the employer has violated****Basic Conditions of Employment Act/BCEA (Act No.75 of 1997) ✓****(1)****3.4 Value of capital items****3.4.1 The capital item****(a) Fixed capital - Capital item B ✓****(1)****(b) Movable capital - Capital item A ✓****(1)****3.4.2 Example of each capital****(a) Fixed capital - Land/farm/building/borehole/fence ✓****(1)****(b) Movable capital - Tractor/truck/machinery/livestock ✓****(1)****3.4.3 The problem of capital reflected by capital item A****Depreciation ✓****(1)****3.5 Financial records****3.5.1 Identification of the financial record****Cash flow statement ✓****(1)****3.5.2 Reason****It reflects:**

- An opening balance ✓
- A closing balance ✓
- Receipts/income ✓
- Payments/expenditure ✓

(Any 1) (1)**3.5.3 The total amount available to run the enterprise at the beginning of the second quarter****R 37 972 ✓****(1)****3.5.4 Calculation of the total costs over the first quarter****Total costs = Costs in Jan, Feb and March****= 9 450 + 8 400 + 4 300 ✓****= R 22 150 ✓****(2)**

3.6 Management skills

- (a) Problem solving/interpersonal skill ✓ (1)
 (b) Financial management skill ✓ (1)
 (c) Organisation and coordination skill ✓ (1)

3.7 Risk factors**3.7.1 Risk management strategy**

- (a) Risk sharing ✓ (1)
 (b) Diversification ✓ (1)

3.7.2 THREE forces beyond the direct control of the farmer

- Economic forces ✓
 - Political forces ✓
 - Ethical forces ✓
 - Legal forces ✓
 - Socio-cultural forces ✓
 - Competitive forces ✓
 - Technological forces ✓
 - Environmental forces ✓
- (Any 3) (3)
[35]

QUESTION 4: BASIC AGRICULTURAL GENETICS**4.1 Mendelian study****4.1.1 The term**

Genetics ✓ (1)

4.1.2 TWO Mendelian laws

- The law of dominance ✓
- The law of segregation ✓
- The law of independent assortment/recombination ✓ (Any 2) (2)

4.2 Feather colour in chickens

- 4.2.1 - White ✓ (1)
 4.2.2 - Black ✓ (1)
 4.2.3 - White ✓ (1)

4.3. Parents and offspring where (Bb) represents horns and (bb) no horns**4.3.1 The phenotype visible in the offspring**

Horned/polled (no horns) ✓ (1)

4.3.2 Calculation (in %) of the homozygous recessive phenotype

$$\frac{1}{4} \times 100 \checkmark$$

$$= 25\% \checkmark \quad (2)$$

4.4 Punnet square method

4.4.1 Punnet square determining the ratio of the genotypes in the first crossing

♂ \ ♀	R	r
R	RR	Rr
R	RR	Rr

MARKING CRITERIA

- Correct male gametes ✓
- Correct female gametes ✓
- Correct offspring ✓
- Punnet-square populated with gametes and offspring ✓
- Genotypic ratio = 2 RR : 2 Rr **OR** 1 RR : 1 Rr ✓ (5)

4.4.2 The genotype of the unknown boar used in the F₂ generation rr ✓ (1)

4.5 Breeding programme with green pepper cultivars

4.5.1 The genetic term for the following

- (a) Heterosis/hybrid vigour ✓ (1)
- (b) Progeny selection ✓ (1)
- (c) Biometrics ✓ (1)

4.5.2 Explanation why the two cultivars were used

Superior parents with the desired characteristics ✓ can produce the offspring required/with the desired/superior characteristics ✓ (2)

4.6 The values of heredity for sheep

4.6.1 Characteristic with the lowest improvement

Lean meat ✓ (1)

4.6.2 Characteristic with the most effective improvement

- (a) Post-weaning gain ✓ (1)
- (b) Birth weight ✓ (1)
- (c) Fleece weight ✓ (1)

4.6.3 ONE other factor to improve the post-weaning gain

Environmental/external factor ✓ (1)

4.7 Breeding systems and technologies

4.7.1 Identification of the breeding system in

- A Upgrading ✓ (1)
- B Inbreeding ✓ (1)
- C Crossbreeding ✓ (1)

4.7.2 TWO disadvantages of inbreeding

- Loss of genetic variation/diversity ✓
- Leads to inbreeding depression/reduced production/fertility ✓
- Increased expression of lethal genes ✓
- Expensive system ✓
- Reduced vitality ✓
- Homozygosity of unwanted genes/deformities ✓

(Any 2) (2)

4.8 Technique used to genetically modify organisms**4.8.1 The technique used**

Micro-injection ✓

(1)

**4.8.2 Differentiation between
Conventional hybrid**

DNA not altered/crossing of two lines/cultivars ✓

(1)

GMO

Altered DNA/genes from another organism are inserted into a cell ✓

(1)

4.8.3 TWO potential risks associated with genetically modified plants

- Health risks/allergies ✓
- Environmental risks ✓
- Economic/financial risks ✓

(Any 2) (2)
[35]

TOTAL SECTION B: 105
GRAND TOTAL: 150