



basic education

Department:
Basic Education
REPUBLIC OF SOUTH AFRICA

NATIONAL SENIOR CERTIFICATE

GRADE 12

AGRICULTURAL SCIENCES P2

NOVEMBER 2015

MEMORANDUM

MARKS: 150

This memorandum consists of 10 pages.

SECTION A**QUESTION 1**

1.1	1.1.1	C ✓✓		
	1.1.2	D ✓✓		
	1.1.3	C ✓✓		
	1.1.4	C ✓✓		
	1.1.5	A ✓✓		
	1.1.6	D ✓✓		
	1.1.7	D ✓✓		
	1.1.8	A/B ✓✓		
	1.1.9	A ✓✓		
	1.1.10	D ✓✓		(10 x 2) (20)
1.2	1.2.1	D ✓✓		
	1.2.2	G ✓✓		
	1.2.3	F ✓✓		
	1.2.4	C ✓✓		
	1.2.5	E ✓✓		(5 x 2) (10)
1.3	1.3.1	Planning ✓✓		
	1.3.2	Advertising/marketing/promotion ✓✓		
	1.3.3	Income statement ✓✓		
	1.3.4	Inbreeding depression ✓✓		
	1.3.5	Homozygosity ✓✓		(5 x 2) (10)
1.4	1.4.1	Demand ✓		
	1.4.2	Productivity ✓		
	1.4.3	Working/floating ✓		
	1.4.4	Conceptual/business/entrepreneurial/adaptability ✓		
	1.4.5	Atavism ✓		(5 x 1) (5)

TOTAL SECTION A: 45

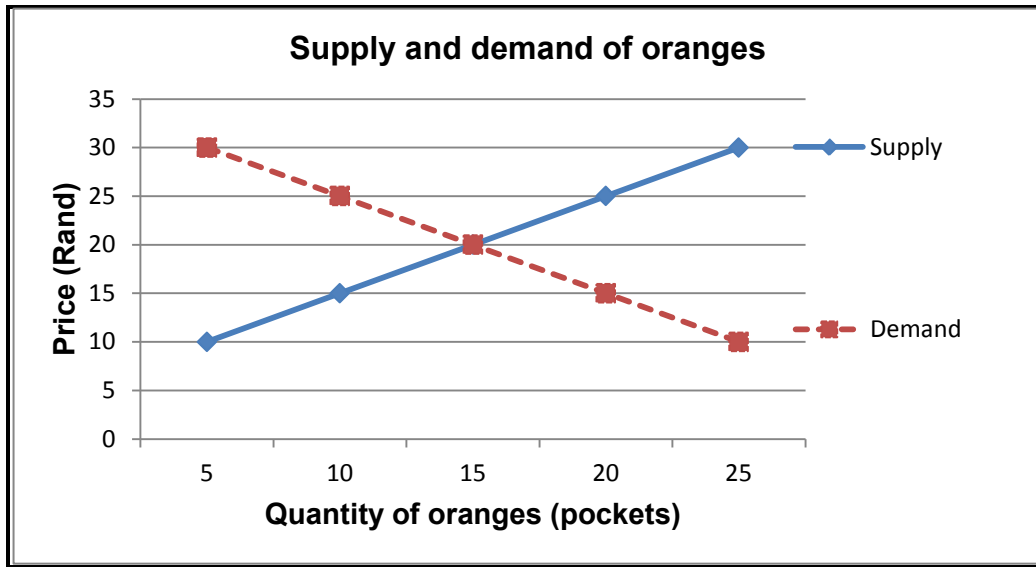
SECTION B**QUESTION 2: AGRICULTURAL MANAGEMENT AND MARKETING****2.1 Marketing of agricultural produce**

- 2.1.1 **Type of marketing**
Free marketing ✓ (1)
- 2.1.2 **Reason for the type of marketing in QUESTION 2.1.1**
- Produce sold anywhere ✓ / produce is directly sold to consumers ✓
 - Direct contact ✓ between producer and consumer ✓ (Any 1) (2)
- 2.1.3 **Channel illustrated**
Direct to consumers/public ✓ (1)
- 2.1.4 **TWO advantages of channel to consumers**
- Consumers can compare/negotiate the price ✓
 - Consumers pay less/no expenditure to intermediaries ✓
 - Consumer confidence/get higher quality ✓ (Any 2) (2)
- 2.1.5 **THREE problems that may hamper free marketing**
- Perishability ✓
 - Competition ✓
 - Seasonal fluctuation ✓
 - Diversity in production ✓
 - Safety/security of the producer ✓
 - Risk/quantity of consumers ✓ (Any 3) (3)

2.2 Demand and supply

- 2.2.1 **Relationship between price, supply and demand**
- The higher the price ✓, the higher the supply ✓ and the lesser the demand ✓
- OR**
- The lesser the price ✓, the lesser the supply ✓ and the higher the demand ✓ (3)

2.2.2 **Graph on the supply and demand of oranges**



Criteria/rubric/marketing guidelines

- Correct heading ✓
- X axis - correctly calibrated and labelled (Quantity of oranges) ✓
- Y axis - correctly calibrated and labelled (Price) ✓
- Correct units (Rand and pockets) ✓
- Accuracy for both graph for demand ✓
- Line graph for supply and demand ✓

(6)

2.2.3 **Reason for higher demand**

- Price for pocket of oranges was low (R10) in week 1 ✓
- but higher (R30) in week 5 ✓

(2)

2.3 **THREE problems encountered when drawing up a business plan**

- Insufficient research/lack of knowledge ✓
- Leaving gaps, being vague or providing too much information ✓
- Insufficient technical detail ✓
- Unrealistic assumptions and projections ✓
- Using incorrect format ✓
- Hiding weaknesses and risks ✓
- Too generic ✓
- Not authentic ✓
- Not highlighting potential competition ✓
- Budget/cash flow errors/Calculation errors/incomplete financial data ✓
- Incompetency ✓

(Any 3) (3)

2.4 Marketing legislation

- 2.4.1 Agricultural Product Standards Act (No. 119 of 1990) ✓ (1)
2.4.2 Meat Safety Act (No. 40 of 2000) ✓ (1)
2.4.3 Consumer Protection Act (No. 68 of 2008) ✓ (1)
2.4.4 Perishable Products Export Control Act (No.9 of 1983) ✓ (1)

2.5 Entrepreneurial qualities**2.5.1 FOUR entrepreneurial qualities**

- Creativity ✓
- Innovation ✓
- Risk taking ✓
- Leadership ✓
- Hard working ✓
- Perseverance ✓ (Any 4) (4)

2.5.2 Explanation of entrepreneurial qualities

- Creativity - starting a cooking and catering business ✓
- Innovation - use of available human/financial resource/learners/ catering for the community activities ✓
- Risk taking - using donation money to start a new business/Start business with few learners ✓
- Leadership - leading a group of learners/the business grew into a training centre ✓
- Hard working - starting/managing a successful business in only two years ✓
- Perseverance - starting/managing a successful business in only two years ✓ (Any 4) (4)

[35]

QUESTION 3: PRODUCTION FACTORS**3.1 Farm labour****3.1.1 Types of labour**

- A - Permanent/full time/skilled/semi-skilled ✓
B - Seasonal/temporary/skilled/semi-skilled ✓

(2)

3.1.2 Justification for QUESTION 3.1.1

- A - Task done on regular and repetitive basis/trained ✓
B - Task done seasonally/trained ✓

(2)

3.1.3 Challenges causing permanent labour to leave the agricultural

- Low wages/search for better wages/opportunities ✓
- Competition ✓
- Lack of training ✓
- Long working hours/✓
- Ill-health/non-conducive/unfavourable working conditions ✓

(Any 2)

(2)

3.1.4 Addressing challenges associated with permanent labour

- Improve on labour utilisation ✓
- Improve economic conditions of labourers ✓
- Ensure that labourers are trained ✓
- Adherence to basic conditions of service ✓
- Provision of health education ✓
- Giving praise and recognition to labourers/motivation ✓
- Provision of appropriate tools/equipment/cloths for the job ✓

(Any 2)

(2)

3.1.5 Legislation regulating safety

Occupational Health and Safety Act (No.85 of 1993) ✓

(1)

3.1.6 Types capital in the photograph A

- Fixed capital ✓
- Movable capital ✓
- Floating/working capital ✓

(Any 2)

(2)

3.2 Land as a production factor**3.2.1 Economic characteristics**

- (a) Agricultural land is limited/has economic value/
urban development affects availability ✓
(b) Land is subject to the law of diminishing return ✓
(c) Land is durable/indestructible ✓
(d) Land is indestructible/of a permanent nature/production
capacity varies ✓

(4)

- 3.2.2 **TWO ways of improving productivity of land**
- Adapting to scientific methods/technology of production/ changing cropping/animal practices ✓
 - Infrastructure ✓
 - Diversification ✓
 - Water provision/irrigation ✓
 - Consolidation of uneconomic units ✓
 - Ensuring that the type of farming is suitable to the area ✓
 - Education/training ✓ (Any 2) (2)
- 3.3 **Market risk**
- 3.3.1 **External force leading to the situation**
Competition ✓ (1)
- 3.3.2 **Type of risk encountered by the manager**
Market/price/financial risk ✓ (1)
- 3.3.3 **Motivation of market risk**
- Increase in the supply of the product ✓
 - resulted in a price decrease ✓ (2)
- 3.3.4 **TWO risk management strategies**
- Future contract/hedging ✓
 - Value adding/processing ✓
 - Flexibility ✓
 - Good understanding of past price trends ✓
 - Diversification/specialisation ✓
 - Effective control ✓ (Any 2) (2)
- 3.3.5 **TWO components of management**
- Planning/setting goals ✓
 - Implementation/coordinating ✓
 - Control ✓
 - Decision making ✓
 - Organsation ✓ (Any 2) (2)
- 3.4 **Capital items and costs**
- 3.4.1 **Classification of items**
- (a) Income - Cattle sales ✓, sheep sale ✓ (2)
- (b) Variable costs - Marketing ✓, grain feed ✓, electricity
telephone bills ✓ (Any 2) (2)
- (c) Overhead costs - Telephone bills ✓, electricity ✓ (2)

3.4.2 **Calculation of net income with the formula**

Income = R110 500 + R80 900 = R191 400 ✓
 Expenditure = R42 350 + R22 500 + R20 000 + R12 500
 = R97 350 ✓
 Net income = Income – expenditure ✓
 = R191 400 – R 97 350
 = R 94 050 ✓

OR

Net income = Income – expenditure ✓
 = R191 400 ✓ – R 97 350 ✓
 = R 94 050 ✓

(4)
[35]**QUESTION 4: BASIC AGRICULTURAL GENETICS**4.1 **Crossing between a brown ewe and white ram**4.1.1 **Phenotype of parents****P1**

- Brown coloured ewe ✓
- White coloured ram ✓

OR**P2**

- Brown coloured ewe ✓
- Brown/white coloured ram ✓

(Any 1) (2)

4.1.2 **Genotype of parents****P1**

- Ewe - AA ✓
- Ram - aa ✓

OR**P2**

- Ewe - Aa ✓
- Ram - Aa/aa ✓

(Any 1) (2)

4.1.3 **Type of dominance**

Complete dominance ✓

(1)

4.1.4 **Motivation**

- Brown colour is dominant over the white colour ✓✓
- No intermediate colour ✓✓

(Any 1) (2)

4.1.5

♀	A	A ✓
♂	a	Aa
	a ✓	Aa ✓

OR

♂	a	a ✓
♀	A	Aa
	A ✓	Aa ✓

Marking criteria

- Male gametes ✓
- Female gametes ✓
- Offspring ✓
- Punnet square ✓

(4)

4.2 Breeding system

4.2.1 Type of breeding system

Upgrading ✓

(1)

4.2.2 TWO disadvantages of upgrading

- Time consuming ✓
- Bulls must always be bought from outside to reduce inbreeding/ it is expensive ✓
- The commercial value of the first few generation is low ✓
- The offspring can never be bred 100% pure ✓ (Any 2)

(2)

4.2.3 Determination of the number of crossings

5 crosses ✓

(1)

4.2.4 Calculation of the percentage characteristic

- Cow: $\frac{1}{2} \times 75\% = 37,5\%$ ✓
- Bull: $\frac{1}{2} \times 100\% = 50\%$ ✓
- $37,5\% + 50\%$ ✓
- $= 87,5\%$ ✓

OR

- $\frac{1}{2} \times (75\% + 100\%)$ ✓
- $= 87,5\%$ ✓

OR

- $\frac{(75\% + 100\%) \times \frac{1}{2}}$ ✓
- $= 87,5\%$ ✓

(4)

4.3 Heritability of the characteristics in sheep**4.3.1 Determination of the EBV for birth weight**

$$\begin{aligned} \text{EBV} &= (\text{Lamb weight} - \text{average weight}) \times \% \text{ heritability} \checkmark \\ &= (3\text{kg} - 1,8\text{kg}) \times 60\% \checkmark \\ &= 0,72 \checkmark \end{aligned}$$

(3)

4.3.2 Implication of the calculated value

- The offspring will be 0,72kg heavier \checkmark than the average flock \checkmark
- The average flock will be 0,72kg smaller \checkmark than the offspring of the lamb \checkmark
- An increase in birth weight \checkmark above the average of the flock by 0,72kg \checkmark (Any 1)

(2)

4.3.3 Heritability of the fleece weight50 % \checkmark

(1)

4.3.4 TWO reasons the post-weaning weight gain cannot be recommended for breeding purposes

- Environment has a huge influence in the outcome of the characteristics \checkmark
- Low heritability/33% heritable \checkmark

(2)

4.4 Genetic modification of lettuce**4.4.1 Difference in yield of GM lettuce and non-GM lettuce**GM lettuce produce better under different conditions \checkmark than non-GM plants under the same conditions \checkmark

(2)

4.4.2 One advantage of GM lettuce in both conditionsHigher yield/ produce better \checkmark

(1)

4.4.3 Benefits of genetic engineering over traditional methods

- Precise/desired genes are transferred \checkmark
- Not limited to crossing of the same species \checkmark
- More convenient \checkmark
- Faster/requires only one generation to complete \checkmark
- More resistant to pests/drought/diseases/herbicides \checkmark
- Higher yields \checkmark (Any 3)

(3)

4.4.4 TWO environmental risks of genetically modified plants

- Creation of herbicide resistant 'superweeds'/harmful pesticide resistant plants \checkmark
- Indiscriminate use of herbicides pollute the environment \checkmark
- Beneficial insects can be killed \checkmark (Any 2)

(2)

[35]

TOTAL SECTION B: 105
GRAND TOTAL: 150