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)

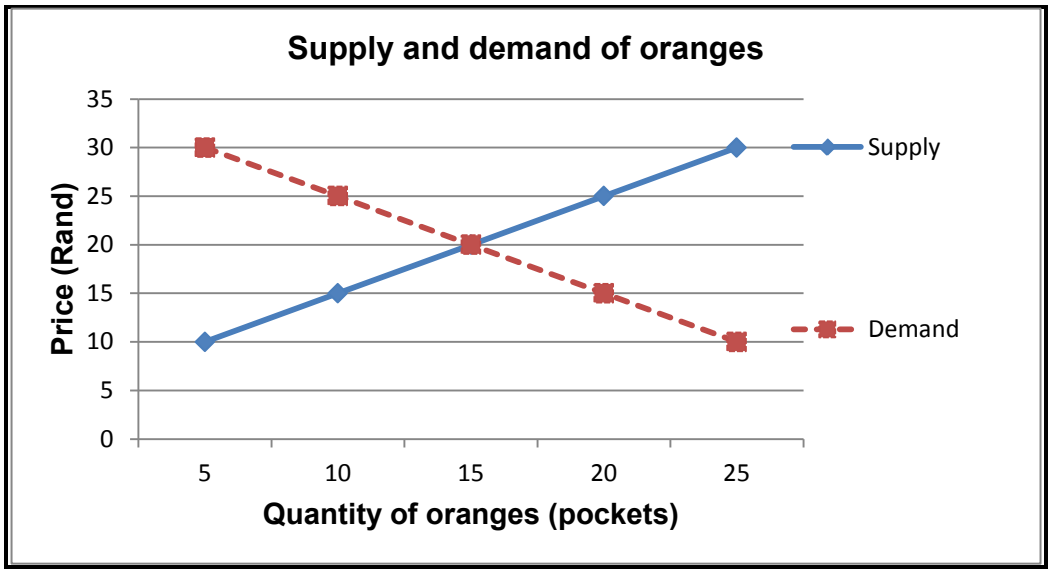
2.2 Demand and supply

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/marking 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)

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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 ✓ (2)
- Organsation ✓ (Any 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 (2)
telephone bills ✓ (Any 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)

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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	Aa
a ✓	Aa	Aa ✓

OR ✓

♂ / ♀	a	a ✓
A	Aa	Aa
A ✓	Aa	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: ½ x 75% = 37,5% ✓
- Bull: ½ x 100% = 50% ✓
- 37,5% + 50% ✓
- = 87,5% ✓

OR

- ½ ✓ x (75% ✓+ 100%✓)
- = 87,5% ✓

OR

- $\frac{(75\% \checkmark + 100\% \checkmark)}{2 \checkmark}$
- = 87,5% ✓ (4)

4.3 **Heritability of the characteristics in sheep**

4.3.1 **Determination of the EBV for birth weight**
EBV = (Lamb weight – average weight) x % heritability ✓
= (3kg – 1,8kg) x 60% ✓
= 0,72 ✓ (3)

4.3.2 **Implication of the calculated value**
- The offspring will be 0,72kg heavier ✓ than the average flock ✓
- The average flock will be 0,72kg smaller ✓ than the offspring of the lamb ✓
- An increase in birth weight ✓ above the average of the flock by 0,72kg ✓ (Any 1) (2)

4.3.3 **Heritability of the fleece weight**
50 % ✓ (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 ✓
- Low heritability/33% heritable ✓ (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 ✓ than non-GM plants under the same conditions ✓ (2)

4.4.2 **One advantage of GM lettuce in both conditions**
Higher yield/ produce better ✓ (1)

4.4.3 **Benefits of genetic engineering over traditional methods**
- Precise/desired genes are transferred ✓
- Not limited to crossing of the same species ✓
- More convenient ✓
- Faster/requires only one generation to complete ✓
- More resistant to pests/drought/diseases/herbicides ✓
- Higher yields ✓ (Any 3) (3)

4.4.4 **TWO environmental risks of genetically modified plants**
- Creation of herbicide resistant 'superweeds'/harmful pesticide resistant plants ✓
- Indiscriminate use of herbicides pollute the environment ✓
- Beneficial insects can be killed ✓ (Any 2) (2)

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TOTAL SECTION B: 105
GRAND TOTAL: 150