**NATIONAL
SENIOR CERTIFICATE**

GRADE 12

AGRICULTURAL SCIENCES P2

FEBRUARY/MARCH 2015

MEMORANDUM

MARKS: 150

This memorandum consists of 10 pages.

SECTION A

QUESTION 1.1

1.1.1	A✓✓
1.1.2	B✓✓
1.1.3	D✓✓
1.1.4	C✓✓
1.1.5	B✓✓
1.1.6	D✓✓
1.1.7	C✓✓
1.1.8	A✓✓
1.1.9	A✓✓
1.1.10	D✓✓
	(10 x 2) (20)

QUESTION 1.3

1.3.1	Entrepreneurs✓✓
1.3.2	Productivity/effectiveness ✓✓
1.3.3	Diversification ✓✓
1.3.4	Di-hybridism ✓✓
1.3.5	Genetic modification/ manipulation/engineering ✓✓
	(5 x 2) (10)

QUESTION 1.2

1.2.1	E ✓✓
1.2.2	D ✓✓
1.2.3	A ✓✓
1.2.4	G ✓✓
1.2.5	C ✓✓
	(5 x 2) (10)

QUESTION 1.4

1.4.1	Segmentation ✓
1.4.2	Marketing chain ✓
1.4.3	Perishability ✓
1.4.4	Depreciation ✓
1.4.5	Prepotency ✓
	(5 x 1) (5)

TOTAL SECTION A: 45

SECTION B

QUESTION 2: AGRICULTURAL MANAGEMENT AND MARKETING

2.1 **Marketing outlets**

2.1.1 **Marketing outlets illustrated in A and B**
A -Farm gate/stall✓
B -Auction✓ (2)

2.1.2 **The letter of the marketing outlet to which each of the following statements refer**

(a) **Products are sold at lower price**
A ✓

(b) **It is easily accessible to small-scale farmers**
A ✓

(c) **Price can be higher than expected**
B ✓

(d) **Marketing costs are reduced**
A ✓ (4)

2.1.3 **The marketing system represented by A and B**
- Free marketing✓ (1)

Reason – Produce sold directly to consumers✓ (1)

2.2 **Emerging farmer**

2.2.1 **TWO entrepreneurial skills**
- Innovative ✓
- Creative ✓ (2)

2.2.2 **Justification**
- Innovative: realisation of youth unemployment by the farmer/ potential of the area to start a business✓
- Creative – started a small scale factory✓ (2)

2.2.3 **TWO possible advantages of securing a contract**
- Protection against price fluctuation✓
- Guaranteed market✓
- Eliminating/cutting out the middleman/intermediary/agent✓
(Any 2) (2)

2.2.4 Source identified by the farmer

(a) Availability of peaches/good supply of peaches✓ (1)
(b) Unemployed youth✓ (1)
(c) Adequate infrastructure✓ (1)

2.2.5 Statement implying that the enterprise was a success
- Production rose from 100 bottles to 1500 bottles per day✓
- Secured a contract with local wholesalers ✓ (Any 1) (1)

2.3 Supply and demand of apples

2.3.1 Graph on the supply and demand of apples
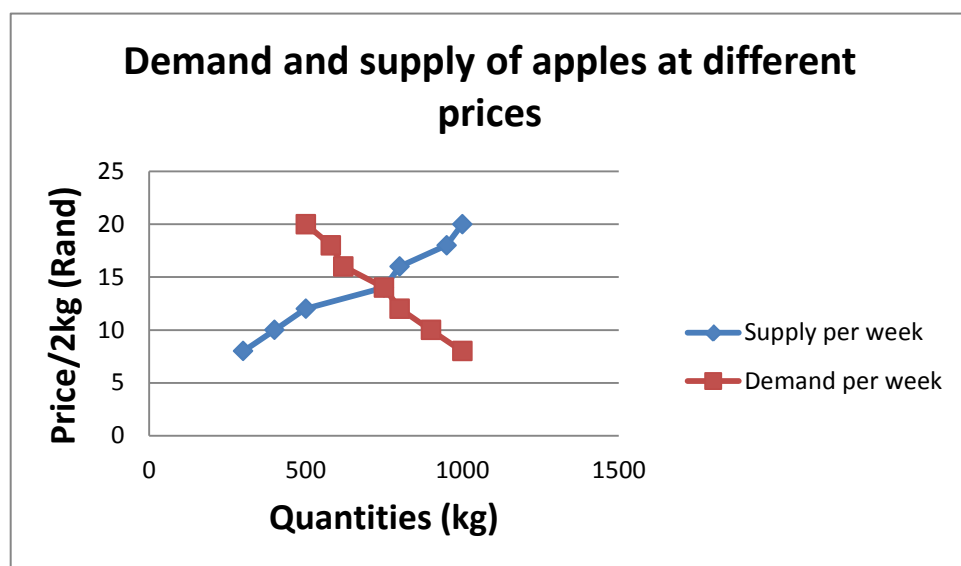
Criteria/rubric/marking guidelines

- Correct heading ✓
- X-axis – correct calibrations and labelled (Price) ✓
- Y-axis – correct calibrations and labelled (Quantity)✓
- Units. (Rand and kg) ✓
- Accuracy/correct plotting ✓
- Line graph ✓ (6)

2.3.2 Equilibrium price of apples
- R14.00 ✓ (1)

2.3.3   **Deduction on availability and price of apples**
- Demand doubles at price R18.00: 580 x 2 = 1160✓
- Supply increases by 20%: $\underline{20}$ x 950 = 190✓
                                                    100
- 190 + 950 = 1140 ✓
- There will be shortage of apples/demand outstrips supply✓
- The price will increase✓   (5)

2.4   **Marketing channels.**

2.4.1   **Most sustainable market for the mutton from the list provided**
- Large supermarket chains✓   (1)

2.4.2   **TWO reasons to support answer in QUESTION 2.4.1**
- Supply to large supermarkets is guaranteed✓
- There is more profit✓   (2)

2.4.3   **Market that holds the highest security risk**
- Local people who buy directly from the farm✓   (1)

2.4.4   **Justification**
- No guarantee of demand ✓   (1)
                                                                         [35]

QUESTION3: PRODUCTION FACTORS

3.1   **Labour management**

3.1.1   **TWO Tasks per labour**

(a)   **Permanent**
- Inspection of watering points✓
- Feeding of stud rams✓
- Dosing of sheep✓
- Counting of sheep and records✓   (Any 2)   (2)

(b)   **Temporary**
- Shearing of sheep✓
- Upgrading of dams and watering troughs✓   (2)

3.1.2   **ONE task that needs computer skills**
- Feeding of stud rams✓
- Dosing of sheep✓
- Counting of sheep and records✓   (Any 1)   (1)

3.1.3   **The most non-repetitive task performed by the labourers**
- Upgrading of dams and watering troughs✓   (1)

3.2   **Labour contract**

3.2.1   **ONE statement addressing a Labour Act**.

(a)   **Occupational Health and Safety**
- Supply of protective clothing✓   (1)

(b)   **Basic Conditions of Employment Act**.
- Working hours✓
- Conditions for termination✓
- Wages and salaries✓   (Any 1)   (1)

(c)   **Labour Relations Act**.
- Contributions towards Unemployment Insurance Fund/ UIF✓
- Affiliation to trade unions and right to strike✓   (Any 1)   (1)

3.2.2   **TWO benefits of UIF to farm workers**

- Payment of farm workers when out of work✓
- Payment of female farm workers while on maternity leave✓   (2)

3.3   **Land as a production factor**

3.3.1   **Economic characteristics**
A – Agricultural land is limited✓   (1)

Justification
Good agricultural soil used for non-agricultural purposes✓   (1)

3.3.2   **TWO ways through which the economic characteristic impacts on the productivity of the land**
- Reduction of land due to the growing population ✓
- poses a pressure to produce more ✓
- and that results to overutilization which in the long run will have a detrimental effect on productivity ✓   (Any 2)   (2)

3.3.3   **TWO ways to increase the productivity of land**
- Adapting to scientific methods✓
- Irrigation✓
- Consolidating uneconomic farm units✓   (Any 2)   (2)

3.4   **Capital as a production factor**

3.4.1

Types of capital	Example	Source of capital
Fixed✓	Dam/ irrigation system/land✓	Loan ✓
Movable✓	Cattle/bakkies✓	Inheritance✓

- One mark for redrawing the table✓   (7)

3.4.2   **Problems associated with capital**

(a) **Buying three bakkies instead of one**
Over-capitalisation✓   (1)

(b) **Loan through a financial institution which will be paid over a ten year period**
- High interest rate✓   (1)

(c) **Investing money on product which could be lost due to natural disasters**
High risk factor✓   (1)

3.5   **Strategic farming management**

3.5.1   **Steps in strategic management**
A - vision ✓
B - goal ✓
C - mission✓
D - objective✓   (4)

3.5.2   **THREE benefits of the programme**
- Improved food security✓
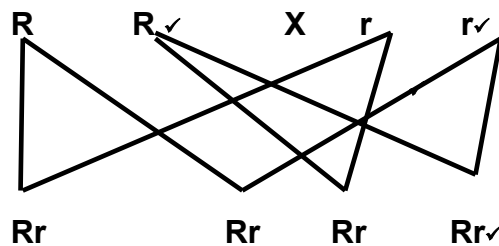- Improved welfare and livelihood/better living standards✓
- Skills development✓   (3)

3.5.3   **ONE skill to anticipate and deal with challenges**
- Problem solving skill✓   (1)

[35]

QUESTION4: BASIC AGRICULTURAL GENETICS

4.1   **Genetic crossing**

4.1.1   **The genetic crossing**

R   R.✓   X   r   r✓

Rr   Rr   Rr   Rr✓

or

	r	r✓
R	Rr	Rr
R✓	Rr	Rr✓

✓ Use of square

(4)

4.1.2   **Calculate the percentage of the black offspring**
- $\frac{4}{4}$ x 100✓
- = 100✓%✓   (3)

4.1.3   **The number of the offspring with a homozygous gene pair**
- 0/zero/nil/none✓   (1)

4.1.4   **Probability to have a red calf**
- RR ✓   (1)

4.2   **Estimated Breeding Value (EBV)**

4.2.1   **Calculation of EBV/ the genetic gain**

EBV = (Animal Weight – Average Herd Weight) x heritability ✓

52,5 kg – 47,5 kg) = 5,0 kg ✓

5,0 kg   x $\frac{85}{100}$= 4,3 kg ✓

EBV = + 4,3 kg or 4,3 kg ✓   (4)

4.2.2 **The implication of the value**
- Offspring will have a slaughter weight of 51,8 kg✓
- The offspring will be 4,3 kg heavier than the flock average✓ (2)

4.3 **Plant improvement**

4.3.1 **Identification of the process illustrated above**
- Genetic modification/GM/manipulation/engineering✓ (1)

4.3.2 **TWO main potential risks of GMO**
- Food safety✓
- Environmental issues✓
- Socio-economic effects ✓ (Any 2) (2)

4.3.3 **The organism labelled C**
Transgenic/GMO✓ (1)

4.3.4 **THREE Characteristics of genetically modified crop**
- Herbicide resistance✓
- Insect resistance✓
- Resistance to harsh environmental conditions✓
- Improved nutritional value/starch/vitamins✓
- Modified/improved quality✓ (Any 3) (3)

4.4 **Variation**

4.4.1 **Importance of variation**
- Brings about new cultivars ✓
- with improved characteristics ✓ (2)

4.4.2 **TWO genetic causes of variation**
- Mutation ✓
- Recombination of genes ✓
- Crossing over of chromosomes/meiosis ✓ (Any 2) (2)

4.4.3 **Types of variation**
- **Continuous variation** - complete range of characteristics from one extreme to another✓
- **Discontinuous variation** - has a few clear-cut or distinct forms with no intermediate forms in between✓ (2)

4.4.4 **Selection**
- Process of choosing individuals✓
- with desirable characteristics for breeding purpose✓ (2)

4.5   **Animal breeding**

  4.5.1   **Identification of the breeding method**
            • Crossbreeding✓   (1)

  4.5.2   **THREE benefits to farmer B**
            • New breeds developed✓
            • Animals will adapt better in varying conditions/better vitality✓
            • Animals will be more resistant to diseases✓
            • High mass gain in relation to food intake✓
            • Leads to heterosis/hybrid vigour✓   (Any 3)   (3)

  4.5.3   **A possible advantage of this breeding method to Farmer A**
            • Making money by selling bulls/sells to farmer B✓   (1)
                                                                        [35]

                                            TOTAL SECTION B: 105
                                            GRAND TOTAL: 150