AGRICULTURAL SCIENCES P2
FEBRUARY/MARCH 2012
MEMORANDUM

MARKS: 150

This memorandum consists of 8 pages.
SECTION A

QUESTION 1.1

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(10 x 2) (20)

QUESTION 1.2

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(5 x 2) (10)

QUESTION 1.3

1.3.1 Savings/Own capital ✔ ✔
1.3.2 Motivation ✔ ✔
1.3.3 Epistasis ✔
1.3.4 Homogenous ✔
1.3.5 Genetic modification/
manipulation/engineering ✔ ✔

(5 x 2) (10)

QUESTION 1.4

1.4.1 Market ✔
1.4.2 Storage ✔
1.4.3 Movable/medium-term ✔
1.4.4 Tenure reform ✔
1.4.5 Hybrid vigour/Heterosis ✔

(5 x 1) (5)

TOTAL SECTION A: 45
SECTION B

QUESTION 2

2.1 Income statements of two farmers

2.1.1 Farmer A has more profit than farmer B ✔

Farmer A: Profit = Income – Expenditure
= R240 000 - 118 000 ✔
= R122 000 ✔

Farmer B: Profit = Income – Expenditure
= R180 000 – 136 000 ✔
= - R44 000 ✔ (5)

2.1.2 Herbicides ✔
Labour ✔ (2)

2.1.3 Herbicides:
• Make use of organic farming ✔ ✔
• Companion cropping ✔ ✔
• GM products ✔ ✔ (Any 1) (2)

Labour:
• Switching to mechanisation ✔ ✔
• Labour numbers decrease by increasing productivity by physical planning ✔ ✔ (Any 1) (2)

2.2 Supply and demand

2.2.1 Factors determining the establishment of prices
• Supply ✔
• Demand ✔ (1)

2.2.2

![Graph of Number of pumpkins bought at different prices](image)
Checklist for marking

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<tr>
<td>Total</td>
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</tbody>
</table>

2.2.3 R5,00
200 bags of pumpkins were sold/200 bags is the largest number

2.3 Marketing strategies of emerging bee-keepers.

2.3.1 Product – The farmer must consider the following points:
- Quality of the product ✓
- Design of packaging the product ✓
- The size of the product ✓
- The variety of the product ✓
- The brand/commercial name ✓ (Any 3)

2.3.2 Placement – The farmer must consider the following points:
- This is the process of distributing the product from one point to the other ✓
- This requires transportation, storage and refrigeration of the product. ✓
- The control of movement of goods is called logistics ✓ (Any 2)

2.4 Change in equilibrium price and the demand curve.

2.4.1 Equilibrium A: demand low ✓
Equilibrium B: demand high ✓
OR
The demand curve will ascend(increase)/demand for an agricultural food product will increase/more agricultural food product ✓ will be demanded ✓

2.4.2 There is always a demand for an agricultural food product /people will always demand food/the demand for food ✓ will always be high ✓

2.4.3 The supply of an agricultural food product will descend/decrease ✓ ✓

2.5 Four steps for reducing and preventing flood damage in the future.
- Ensure that there is a good understanding of past trends in rainfall patterns and flooding in that area ✓
- Test new production enterprises that are not more vulnerable to flood damage ✓
- Manage enterprises in such a way to reduce risks ✓
- Take out an insurance against natural disasters (flooding) ✓
QUESTION 3

3.1 Scenario

3.1.1 TWO examples of floating capital
- Vegetable seeds✓
- Fertilisers✓
- Insecticides✓
- Tools✓ (Any 2) (2)

3.1.2 Temporary labourers✓ – they were occasional labourers ✓ (2)

3.1.3 Loan/credit✓ (1)

3.1.4 TWO ways to increase the productivity of the land
- Increase the size of the vegetable garden/combining land into a more economic unit ✓
- Bought seeds/Adapt scientific methods of farming ✓
- Effective use of capital/money ✓
- Water provision/irrigating the soil/supply irrigation system ✓ (Any 2) (2)

3.1.5 FOUR components of successful management
- Planning✓
- Control✓
- Decision making✓
- Motivation✓
- Organisation and co-ordination✓ (Any 4) (4)

3.1.6 Differences between medium and short-term credits
Medium-term credit:
- The interest rate is relatively high and
- the loan can be paid back within 10 years ✓
- e.g. Machinery, greenhouse ✓ (Any 2)
Short-term credit:
- The interest rate is very high and ✓
- the loan can be paid back in less than 2 years ✓
- This finance is required to purchase fuel, fertilisers and goods ✓ (Any 2) (4)

3.2 Work plan for rearing sheep

3.2.1 TWO duties requiring permanent workers
- Herding✓
- Dipping✓
- Dosing✓ (Any 2) (2)
3.2.2 **FOUR ways to improve living conditions of workers**
- Adequate housing✓
- Adequate food and clothing✓
- Adequate recreation facilities✓
- Adequate leave✓
- Adequate wages, pension and bonus schemes✓
- Education and training possibilities✓

(Any 4) (4)

3.2.3 It is a seasonal activity/it only occurs at a particular season/done✓ in October✓ (2)

3.2.4 **TWO techniques of managing potential risks**
- Provision of shelter for protection against extreme conditions✓
- The farmer needs to find out whether climatic disasters is a common occurrence in the area (looking at historical data)✓
- Use a breed of sheep that is more adaptable to extreme climatic conditions prevalent in the area✓

(Any 2) (2)

3.3 **Financial record keeping**

3.3.1 **Importance of keeping financial records**
Financial record keeping allows the farmer to analyse past and present (current) performance of the business/ allows the farmer to plan✓ the future of the business.✓

(2)

3.3.2 **Implication of overcapitalisation**
- When too much money is borrowed to invest in farming✓, a high interest rate may make the farm unprofitable✓
- Additional capital is not fully utilised✓ as a result; there is no value for money.✓

(Any 1 x 2) (2)

3.3.3 **Use of farm assets as collateral**
The bank will only give credit when there is security✓, hence farm assets will act as security.✓

(2)

3.4 **Labour problems**

3.4.1 **TWO ways to solve the lack of training**
- Enrol labourers for skills development✓
- Organise short-term courses for labourers✓
- Allow labourers to specialise in certain tasks✓

(Any 2) (2)

3.4.2 **TWO ways of motivating farm labourers no to go to industries**
- Provide financial incentives/performance rewards✓
- Provide adequate living conditions (adequate housing, food, recreation facilities, wages, pension, bonus, leave, medical aid, training possibilities✓
- Appreciation for work done✓

(Any 2) (2) [35]
QUESTION 4

4.1 Breeding possibilities

4.1.1
(a) bb ✔
(b) Bb ✔
(c) bb ✔
(d) Bb ✔

(4)

4.1.2 50% ✔
(2)

4.2 GMO crop

4.2.1 Explanation of the technique
- DNA is extracted from *Bacillus thuringiensis* ✔
- DNA is transferred to a maize plant/GMO plant ✔
- Different techniques are utilised to transfer the DNA ✔
- The GMO maize plant acquires resistance to maize stalk borer ✔

(4)

4.2.2 Benefits of GM crops
- More productive with higher yields ✔
- Resistant to pests and diseases hence reduce the use of chemicals ✔
- Tolerant to harsh conditions ✔
- Longer shelf life and better properties ✔
- Better flavour, colour, texture and nutritional value ✔
- Cheaper and more plentiful food ✔
(Any 3)  (3)

4.2.3 Possible spread of genes from GM crops into other wild plants e.g. creation of herbicide-resistant super weeds ✔
- Beneficial insects as well as pests could be killed ✔
(2)

4.3 Cloning

4.3.1 No gametes fuse in the process of cloning ✔
- but cloning is the production of an individual natural fertilisation ✔
- which is genetically identical to the one from which it was produced ✔
- without organisms mating/both male and female animal involved ✔
(Any 2)  (2)
4.3.2 The manipulation of an ovum of an animal where the nucleus is removed✓
    and added into the egg cell with nucleus of the animal to be cloned✓
    embryo is implanted into the womb/uterus of a surrogate mother✓- developing embryo contains genetic material of the donor✓
    clone animal is produced✓ (Any 4)  (4)

4.3.3 Farmers will be able to produce animals which are identical✓ to those they already have and prefer✓ (2)

4.4 TWO desirable selection characteristics of livestock
    - Diseases and pest resistance✓
    - Tolerance to extreme temperatures✓
    - High feed conversion rate✓
    - High fertility/fecundity✓ (Any 2)  (2)

4.5 Breeding systems

4.5.1 Suitable animal breeding system
    - Cross breeding ✓
    - Substantiation – there are two breeds ✓
    - that are involved viz. Nguni and Brahman ✓ (3)

4.5.2 Three advantages of cross breeding
    - Development of new breeds ✓
    - Hybrid vigour (heterosis) is accompanied by:
      o Greater meat production ✓
      o Greater viability ✓
      o Greater disease-resistance ✓
      o Better motherly instincts ✓
      o Fast growth rates ✓
      o Increased fertility ✓
      o Better food conversion ✓
      o Better adaptation to environmental conditions ✓ (Any 3)  (3)

4.5.3 Motivation of Brahman as a superior breed to the Nguni
    - Produce good heavy, early weaners ✓
    - Big breed compared to the small Nguni breed/taller – height and weight ✓
    - Grow fast in feedlots ✓
    - Hardy and resistant to diseases ✓ (Any 3)  (3)

4.5.4 ONE traditional value of the cattle amongst the Xhosa community
    - Old and devalued cows are slaughtered for traditional ceremonies ✓ (1)

[35]

TOTAL SECTION B: 105
GRAND TOTAL: 150

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