AGRICULTURAL SCIENCES P2

NOVEMBER 2011

POSSIBLE ANSWERS

MARKS: 150

This memorandum consists of 9 pages.
### SECTION A

#### QUESTION 1.1

<table>
<thead>
<tr>
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<th>B</th>
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**Total:** (10 x 2) (20)

#### QUESTION 1.2

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**Total:** (5 x 2) (10)

#### QUESTION 1.3

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<tr>
<td>1.3.1</td>
<td>Budget/business/enterprise plan ✓✓</td>
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<td>1.3.2</td>
<td>Cooperative ✓✓</td>
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<td>1.3.3</td>
<td>Multi segmented ✓✓</td>
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<td>1.3.4</td>
<td>Electroporation/genetic manipulation/engineering/ biotechnology ✓✓</td>
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**Total:** (5 x 2) (10)

#### QUESTION 1.4

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<td>1.4.3</td>
<td>Crossbreeding/out breeding ✓</td>
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<td>1.4.4</td>
<td>Private ✓</td>
</tr>
<tr>
<td>1.4.5</td>
<td>Manager/entrepreneur/owner ✓</td>
</tr>
</tbody>
</table>

**Total:** (5 x 1) (5)

**TOTAL SECTION A:** 45
SECTION B

QUESTION 2: AGRICULTURAL MANAGEMENT

2.1 Financial record keeping

2.1.1 Importance of keeping financial records
- To manage the capital of a farm/determine profit or loss /idea of income and expenses✓
- To analyse past and current performance/analyse success of business ✓
- Plan for the future of the farm /budgeting/replanning✓
- Proof of payment/Tax purposes✓

(Any 2) (2)

2.1.2 Total transport cost
R80,00 + R40,00 + R80,00 = R200,00 ✔ ✔

OR
R80, 00 + R40, 00 + R80, 00 ✔ = R200, 00 ✔

(3)

2.1.3 Profit = income – expenses ✔
= R 2 058 – R 1 093 ✔
= R 965 ✔ ✔

OR
Profit = income – expenses ✔
= R 2 093 – R 1 093 ✔
= R1 000 ✔ ✔

(4)

2.1.4 • Farm workers receive eggs for free/4 dozen eggs were given to workers ✔ ✔

(2)

2.1.5 Creation of capital
- Production/layers ✓ – created when more eggs are produced and then offered to generate capital ✓
- Capital needed to start a business is obtained by means of credit/loan ✔ supplied by financial institutions/ABSA/bank ✔
- Savings ✔ – farming profits are allowed to accumulate in the bank ✔

(Any 2 x 2) (4)

2.2 Cellphones beat stock thieves

2.2.1 TWO reasons for investing in high-tech anti-stock theft security systems
- For the fight against stock theft/to notify when animals are in danger ✓
- Indication of the time when mating takes place/assist in management/saves time and labour ✓
- Indication of the ram and ewe that were involved in mating ✓
- Tracking/monitoring the movement of animals ✓
- To determine grazing patterns of animals ✔

(Any 2) (2)
2.2.2 **TWO important entrepreneurial skills of the manufacturers**

- Creativity ✓ - involve new ideas that are put to test/first of its kind ✓
- Innovation ✓ - the systems are of a high-tech nature/it is a futuristic apparatus that can accommodate many uses ✓
- Marketing/communication ✓ - convince the clients to use the apparatus ✓
- Technical ✓ - knowledge on installing of the apparatus ✓
- Research/problem solving ✓ - determine the opportunity in the market ✓
- Risk orientation ✓ - high initial investment for the manufacturer

(Any 2) (4)

2.3 **Entrepreneurial success factors [Only used once]**

2.3.1 Motivation/appreciation ✓ (1)
2.3.2 Punctuality ✓ (1)
2.3.3 Appreciation/motivation ✓ (1)
2.3.4 Leadership ✓ (1)

2.4 **The demand and supply graph**

2.4.1 • Reversed relationship/As the quantities supplied increases ✓ the demand for the product will decrease ✓

**OR**

- Reversed relationship As the quantities demanded increases ✓ the supply of a agricultural product would decrease ✓ (2)

2.4.2 • A point where the amount demanded by the market and the amount supplied ✓ are equal ✓

**OR**

- Supply = ✓ demand ✓ (2)

2.4.3 • Equilibrium price high/R30 at supply (before) and low/R20 at supply (after)/the supply described as before had an equilibrium price that was higher ✓

- Compared to the situation after ✓ (2)

2.4.4 • Quantities before: 200 ✓
- Quantities after: 300 ✓ (2)

2.4.5 • Graph B ✓
- The demand was higher after the promotion/demand before was 200 and then increased to 300 ✓ (2)

[35]
QUESTION 3: PRODUCTION FACTORS AND MANAGEMENT

3.1 Recordkeeping: physical and financial records

3.1.1 (a)  (b)
- Borehole with a windmill ✓
- Farm shed ✓
- Tractor ✓
- Bakkie (Farm van) ✓ (2)

3.1.2 THREE sources of capital
- Commercial Bank ✓
- Land Bank ✓
- Development Finance Corporation Ltd. ✓
- Insurance companies ✓
- Agricultural cooperatives ✓
- Agricultural business partners ✓

(Any 3) (3)

3.1.3 Net worth is the difference between ✓ the value of your assets ✓ and the value of your liabilities ✓

(3)

3.2 THREE functions of land as a production factor:
- Provides space ✓
- Provides raw materials ✓
- Provides food for humans and animals ✓
- It is a source of minerals used as fertilisers ✓

(Any 3) (3)

3.3 Approaches to management

3.3.1 Farmer A:
- Sound financial management ✓
- Neatness/orderly
- Humanitarian relations/caring towards labour ✓

(Any 1)

Farmer B:
- Money saving approach/stingy farmer ✓
- Savings (worthiness record)/cash operation
- Not caring towards labourers/bad human relations ✓

(Any 1) (2)

3.3.2 Farmer A ✓
and
Built new homes for workforce/water and electricity to workers/neatness stimulates motivation ✓

(2)
3.4 Coordination of production factors

3.4.1 (a) A ✓ (1)
(b) C ✓ (1)
(c) F/D ✓ (1)
(d) B/E ✓ (1)
(e) E ✓ (1)

3.4.2 • Supervision/Control/Coordination/organising✓
• Entrepreneur is supervising workers according to the plan ✓ (2)

3.4.3 • Planning skills ✓
• Financial skills ✓
• Management skills ✓
• Human relations skills ✓
• Risk orientation skills ✓
• Communication skills ✓
• Leadership skills ✓
• Marketing skills ✓
• Organisational skills ✓
• Motivational skills ✓
• Problem solving ✓ (Any 2) (2)

3.4.4 Owner/Farmer/Manager/Entrepreneur/A ✓ (1)

3.5 Labour management

3.5.1 B ✓ (1)
3.5.2 A ✓ (1)
3.5.3 D ✓ (1)
3.5.4 E ✓ (1)
3.5.5 B/D ✓ (1)

3.6 Labour legislation

3.6.1 (a) The labour Relations Act (1995)
• It governs labour relations at workplace/unfair labour practices/regulates trade union activities ✓
• It governs the involvement of workers in decision making ✓
• It governs procedures for labour disputes/right to strike ✓ (Any 1) (1)
(b) **Occupational Health and Safety Act (1993)**
- It deals with the safety of workers in the workplace/mutual responsibility on safety ✓
- It makes the farmer responsible to ensure that the working environment is safe ✓
- It holds the farmer responsible to provide protective clothing to workers ✓
- It holds the farmer responsible to train workers on operating machinery or equipment ✓

3.6.2 The Compensation for Occupational Injuries and Diseases Act ✓

[35]

**QUESTION 4: BASIC AGRICULTURAL GENETICS**

4.1 **Illustration of incomplete dominance**

4.1.1 **Completion of the missing answers in the blocks**

![Diagram]

4.1.2 Incomplete dominance ✓

4.1.3 **Motivation on the type of dominance**
- Parents of $P_1$ have only homozygous (pure-bred) dominant genes/intermediate phenotype is shown in the offspring/none of the colours of parents are visible in the offspring ✓
- There are no recessive genes in all the generations ✓
- The phenotypic ratio of the $F_2$ is 1:2:1 ✓

4.1.4 Testes/Ovary/Primary sex organs/Primary reproductive organs ✓
4.2 Crossing of farm animals

4.2.1 Black ✓ and white ✓

4.2.2 Male ✓

4.2.3 $\frac{2}{4} \times 100\% = 50\%$
OR
50% ✓ ✓

4.3 Indigenous cattle breeds of South Africa

4.3.1 Indigenous cattle breeds of South Africa/Nguni cattle are reintroduced ✓

4.3.2 Adaptation qualities of Nguni cattle
- Resistant to a number of diseases ✓
- Resistant to internal and external parasites ✓
- Adapted to high excessive heat conditions ✓
- High fertility ✓
- Short calving interval ✓
- High adaptation to poor quality grazing ✓
- Long productive lifespan ✓ (Any 3)

4.4 Schematic representation of line breeding

4.4.1
- 13 ✓
- 5 ✓
- 7 ✓

4.4.2 Benefits of upgrading to livestock farmers
- A new breed is gradually imported into the herd/fewer adaptation problems ✓
- Economical way to raise the stock to a pedigree level ✓
- Initial rapid results (50% improvement in first generation) ✓
- Deformities and unwanted characteristics occur less frequent ✓
- Expert knowledge not needed ✓
- Creates a more uniform herd ✓ (Any 3)

4.5 FOUR selection methods used by livestock breeders
- Mass/individual selection ✓
- Pedigree selection/blup ✓
- Family selection ✓
- Progeny selection/performance of progeny ✓
- Natural selection ✓
- Breeding values ✓ (Any 4)
4.6 Genetically modified sorghum

4.6.1
- Enriched with vitamins ✓
- Balanced in terms of nutrition/prevent malnutrition ✓
- To alleviate the problem of poverty/hunger in Africa ✓
- Improve cultivars ✓
- Improved seed appropriate for planting ✓ (Any 2) (2)

4.6.2
- GM sorghum will be vitamin enriched (packed) ✓
- to help fight malnutrition ✓ (2)

4.6.3** TWO dangers of GM food**
- GM food risk destabilising the environment/Contamination of local seed stocks ✓
- GM food risk destabilising food production ✓
- Socio-economic concerns ✓
- Food safety/health risk ✓ (Any 2) (2) [35]

TOTAL SECTION B: 105
GRAND TOTAL: 150