NATIONAL SENIOR CERTIFICATE EXAMINATION
NOVEMBER 2017

AGRICULTURAL SCIENCES: PAPER II

MARKING GUIDELINES

Time: 2½ hours 150 marks

These marking guidelines are prepared for use by examiners and sub-examiners, all of whom are required to attend a standardisation meeting to ensure that the guidelines are consistently interpreted and applied in the marking of candidates' scripts.

The IEB will not enter into any discussions or correspondence about any marking guidelines. It is acknowledged that there may be different views about some matters of emphasis or detail in the guidelines. It is also recognised that, without the benefit of attendance at a standardisation meeting, there may be different interpretations of the application of the marking guidelines.

SECTION A

QUESTION 1

1.1

1.1.1	A	~~B~~	C	D
1.1.2	~~A~~	B	C	D
1.1.3	A	B	~~C~~	D
1.1.4	A	B	C	~~D~~
1.1.5	A	B	~~C~~	D
1.1.6	~~A~~	B	C	D
1.1.7	A	B	~~C~~	D
1.1.8	A	~~B~~	C	D
1.1.9	~~A~~	B	C	D
1.1.10	A	~~B~~	C	D

1.2

1.2.1	H
1.2.2	F
1.2.3	D
1.2.4	C
1.2.5	G

1.3

1.3.1	Mule
1.3.2	Credit/loan
1.3.3	Marketing/Advertisement
1.3.4	Motivation/Incentive
1.3.5	Genetic engineering/modification

1.4

1.4.1	Retail
1.4.2	Atavism
1.4.3	Losses/risks
1.4.4	Heterosis/hybrid vigor
1.4.5	Working/production/floating/trading

SECTION B

QUESTION 2 AGRICULTURAL MANAGEMENT AND MARKETING

2.1 Financial statements

2.1.1 Calculation of values

A = 36 500
B = 37 300
C = 35 900
D = 36 000

2.1.2 Profitability calculations

Farmer A: 37 300 – 36 500 = 800
Farmer B: 36 000 – 35 900 = 100

Therefore Farmer A is more profitable

2.1.3 Cost reduction strategies

- By reducing the amount of labour used
- Reduce the number of labourers used
- Save water wherever possible
- Find a cheaper supplier of laying hens
- Try and source cheaper feed
- Solar power
- Cheaper egg trays

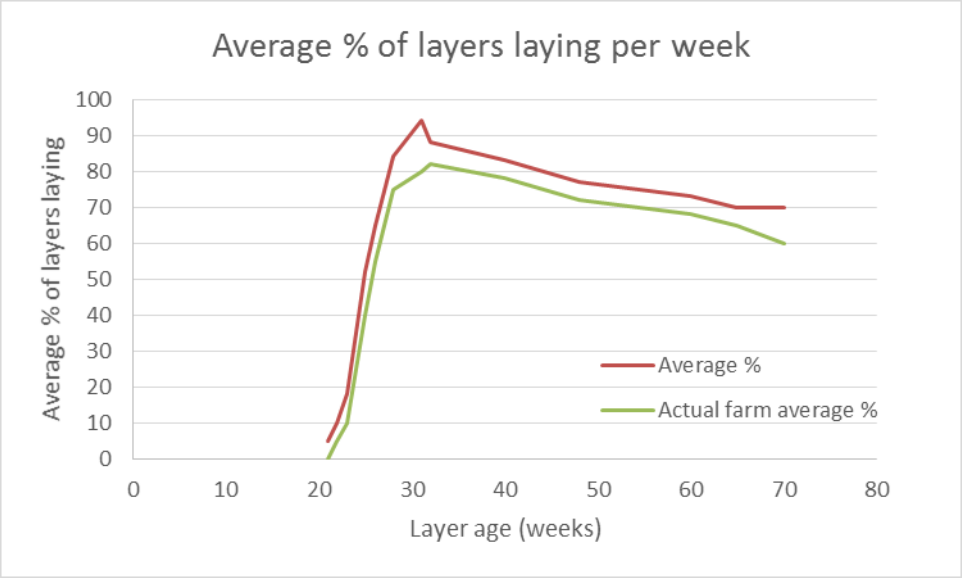
(Any 3)

2.1.4 Components of a cash-flow budget

Income – sale of livestock, manure, eggs
Expenditure – operating expenses (layers, feed, gas, egg trays, veterinary care, maintenance), electricity, water and wages
Profit – gain or loss
(Any 2)

2.2 Layers laying eggs

2.2.1 Line graph



Line graph check list

Evidence	Yes	No
Heading	1	0
X axis labelled (Layer age (weeks))	1	0
Y axis labelled (Average % of layers laying)	1	0
Correct values	1	0
Line graph: Average %	1	0
Line graph: Actual farm average %	1	0

2.2.2 Better or worse than district average

Worse
The actual on farm average is consistently below the district average

2.2.3 Number of eggs during week 32

10 000 × (82/100) × 7
= 574 000 eggs

2.2.4 Difference in money between average and actual

10 000 × (94/100)/12 = 783 dozen

10 000 × (80/100)/12 = 666 dozen

783 – 666 = 117 dozen

117 × R7,50 = R877,50 more if on district average

2.3 **Business plan**

FIVE main items
- Name of the business/partnership/partners
- Summary of business plan/strategy
- Production plan
- Management plan/time management plan
- Sales and marketing plan
- Financial plan
- Reasons for success of business
  (Any 5)

QUESTION 3 PRODUCTION FACTORS

3.1 **Farm management**

3.1.1 **FOUR main management factors**
- Production/physical resources/environment/land
- Staffing/human resources/labour
- Finances/capital
- Marketing

3.1.2 **FOUR External influences**
- Political environment/politics
- Global economic environment/economy
- Social environment/society/effect of HIV/AIDS/culture/religion/life-style choice
- Legal environment/law/legislation/justice
- Natural disaster/extreme climatic conditions
- Profitability
- Ethics
- Environmental sustainability
- Competition from other sectors
- Technological forces
- Disease
  (Any 4)

3.1.3 **FIVE Economical characteristics of land**
- Can be bought and sold
- Appreciates over time (good investment)
- Has a production potential which influences the market value
- Is indestructible
- It is connected to the law of diminishing returns
- Good land is limited
- Different production capacities/restrictedness
- Is durable/soil is permanent/long lasting
- Limited to specific environment/economic situation/fixed
- Availability of agricultural land is limited
  (Any 5)

3.2 Job applications

3.2.1 Scoring of the candidates

Candidates	Qualification level	Management skills	Technical skills
Candidate A	3 / good	3 / good	1 / weak
Candidate B	1 / weak	1 / weak	3 / good

3.2.2 Candidate suitability

(a) Candidate A – has good qualifications and management skills

(b) Candidate B – good technical skills

3.3 Income statement

3.3.1 Examples of various components

(a) **Overheads**
Bank charges/electricity and water/marketing costs/telephone/ insurance and licenses
- Not linked to one enterprise in particular

(b) **Variable costs**
Feeds/seeds and seedlings/fertiliser and lime/weedicide and pesticide/fuel, oil and grease/labour costs, livestock purchases
- Affected by level of production

(c) **Fixed costs**
Repairs to fixed improvements, rent
- These will not vary with the level of production

3.3.2 Reducing labour expenses
- Mechanization
- Increase their productivity
- Reduce the labour force
- Send labour for training
(Any 2)

3.4 Four ways managers can improve workers' living conditions
- Adequate housing
- Adequate food and clothing
- Adequate recreation facilities
- Adequate leave
- Adequate wages, pension and bonus scheme
- Education and training
- Free lights and water
- Provide transport to and from work
(Any 4)

QUESTION 4 BASIC AGRICULTURAL GENETICS

4.1 Maize breeding

4.1.1 Punnett square

	A	a
A	Aa	aa
a	Aa	aa

4.1.2 Genotype definition

(a) The genetic make-up/code/alleles/composition of an organism.

Phenotype definition

(b) The appearance of the individual affected by the genotype and its interaction with the environment.

Recessive gene definition

(c) Gene that is overshadowed/dominated in a crossing by another gene and becomes less visible/hidden/does not express itself in the offspring.

4.1.3 Bt maize characteristics

- Pest resistance
- Herbicide resistance
- Drought resistance
- Adaptability to environmental conditions
- Disease resistance
- Early maturing to escape harsh conditions
- Longer period of keeping germination ability

4.2 *Agapanthus* breeding

4.2.1 Missing labels

i – Bb
ii – Bb
iii – 100% Bb
iv – Bb
v – Bb
vi – B
vii – b
viii – B
ix – b

4.2.2 **Genotype of F_1 generation**
100% are Bb

4.2.3 **Genotype of F_2 generation**
25% BB : 50% Bb : 25% bb

4.2.4 **White flower %**
25%

4.3 **Indigenous cattle**

4.3.1 **Evidence of Nguni being indigenous**
Indigenous cattle breed of South Africa/Nguni cattle are reintroduced

4.3.2 **Four adapting qualities of Nguni cattle**

- Resistant to a number of diseases
- Resistant to internal and external parasites
- Adapted to excessive heat conditions
- High fertility
- Short calving interval
- High adaptation to poor quality grazing
- Long productive lifespan
  (Any 4)

Total: 150 marks