

## MARKING GUIDELINES

| EXAMINATION     | NATIONAL SENIOR CERTIFICATE |
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## SECTION A

### QUESTION 1

1.1

1.1.1 D ✓✓

1.1.2 A ✓✓

1.1.3 B ✓✓

1.1.4 D ✓✓

1.1.5 C ✓✓

1.1.6 A ✓✓

1.1.7 D ✓✓

1.1.8 B ✓✓

1.1.9 C ✓✓

1.1.10 D ✓✓

(10 x 2) = (20)

1.2

1.2.1 E ✓✓

1.2.2 I ✓✓

1.2.3 A ✓✓

1.2.4 F ✓✓

1.2.5 G ✓✓

(5 x 2) = (10)

1.3

1.3.1 Niche marketing ✓✓

1.3.2 Labour productivity ✓✓

1.3.3 Locus ✓✓

1.3.4 Artificial selection ✓✓

1.3.5 Gene silencing ✓✓

(5 x 2) = (10)

1.4

1.4.1 SWOT analysis ✓

1.4.2 Labour ✓

1.4.3 chromosome ✓

1.4.4 mono-hybrid ✓

1.4.5 vector ✓

(5 x 1) = (5)

**TOTAL SECTION A: [45]**



## SECTION B

### QUESTION 2: AGRICULTURAL MANAGEMENT AND MARKETING

#### 2.1 Marketing

##### 2.1.1 a) Grading and standardisation:

Agricultural products are classified to give uniformity ✓ to a group of products. The products are classified according to pre-determined standards and quality aspects (size, colour, appearance, taste, etc.). ✓

This assist consumers to make decisions when buying products. ✓ (3)

##### b) Storage:

Keeping products in proper conditions ✓ from the time it is produce until it is needed. Storage provides for a regular flow of products to the market. ✓ Products which are seasonal/perishable are kept in cold storage facilities. ✓

(3)

#### 2.2 Prices of agricultural products

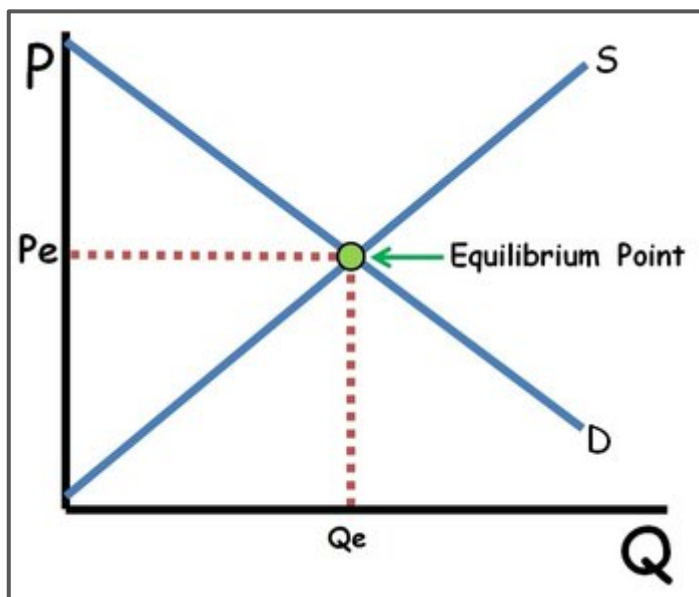
- **Determining the price of agricultural products**

Prices of agricultural products are determined by the demand and supply. ✓

- Demand is the number of products that consumers will be willing and able to buy at a different price. ✓
- Supply is the number of products that producers will be willing to produce and sell at a different price. ✓

(3)

- **General graph indicating the equilibrium price:**



✓✓ (Correct graph)

The equilibrium price is the price at which the demand and supply is the same ✓

– the price at which the quantity demanded equals ✓ the quantity supplied. ✓ (5)



## 2.3 Marketing systems

### 2.3.1 Principles of co-operations

- Democratic member control: cooperatives are organisations controlled by their members, who contribute equally and have equal say. ✓
- Voluntary and open membership: any person who can benefit from services should be free to join. ✓
- Autonomy and independence: autonomous, self-help organisations, controlled by members. ✓
- Educational training and information: provide education and training for members, managers and employees to contribute effectively. ✓
- Co-operation among co-operatives: serve their members most effectively and strengthen the co-operative movement by working together through local, regional, national and international sectors. ✓
- Concern for community: sustainable development of communities. ✓
- Economic participation of members: same membership fee. Benefit proportionally according to transactions with co-operative for example crops delivered. ✓
- (Any 4) (4)

### 2.3.2 Comparison of direct and indirect marketing channels:

**Indirect marketing** involves the movement of products using intermediaries, ✓  
it will lead to less profit, and the intermediary will take a cut. ✓

**Direct marketing** is where farmers sell to consumers/retailers directly, ✓  
makes better profits. ✓ (4)

### 2.3.3 Important role of legislation

- To increase market access to all market participants, large, small and subsistence farmers. ✓
- To see to it that the marketing of agricultural products is carried out satisfactorily, for example by providing market information. ✓
- To see to it that profits made from exports are as high as possible for example by ensuring that standards for quality are set and kept to. ✓
- To support the agricultural sector so that it can survive and remain profitable. ✓
- (Any 2) (2)

## 2.4 Entrepreneurship

### 2.4.1 FOUR phases in the entrepreneurial process:

1. Identify and evaluate the opportunity: ✓ an opportunity can be regarded as good if it is attractive in terms of potential profit and well-timed and appropriate in terms of the current needs and preferences of consumers. The potential of the business ideas as well as the ability of the entrepreneur to put it into practice have to be examined. A feasibility study can be done to examine the potential of the idea in terms of profit. ✓



2. Develop the business plan: ✓ once the opportunity is identified, a business plan must be developed, which provides more detail about the opportunity, recourses needed and implementing and managing the business idea. ✓
3. Determine recourses required: ✓ include capital investments and labour as well as physical assets such as machinery, equipment and facilities. First will be started with own resources and then how much loan funding is needed. A cash flow projection will also be needed for a certain period. ✓
4. Start and manage the agri-business: ✓ After having obtained the capital for start-up, the entrepreneur has to implement the plan. Effective management of all aspect of the agri-business is important for success. ✓

(4 steps x 2) = (8)

#### 2.4.2 Types of agri-business plans applied in situations:

- To expand ✓
- To plan new agri-businesses ✓
- To sell the agri-businesses ✓
- Obtain a loan, attract investment/partners ✓
- (Any 2)

(2)

#### 2.4.3 Challenges experienced during the drafting of a business plan:

- Inadequate market research. ✓
- Estimates of funding requirement not correct. ✓
- Estimates of potential production output not correct. ✓
- Not being objective in presenting information. ✓
- Not being able to identify risks and obstacles that maybe prevent success. ✓
- (Any 1)

(1)

**[35]**



### QUESTION 3: PRODUCTION FACTORS AND MANAGEMENT

#### 3.1 Functions of land

##### 3.1.1 List TWO functions of land.

- provides space for economic activities.✓
- provides food for plants, animals and humans.✓
- provides raw material.✓
- provides minerals.✓
- (Any 2)

(2)

##### 3.1.2 Techniques by farmer B to increase land productivity:

- Adapt production to scientific methods.✓
- Scientific methods such as satellite mapping of crop fields will increase the land productivity. ✓
- Use of technology.✓
- Technology can be used to complete tasks in less time and with lower production costs with more precision. Tractors linked to satellites are more productive than ploughing with oxen. ✓
- Gather enough information on the land to be used✓
- Soil should be surveyed, analysed and classified by soil scientists. This will provide the farmer with knowledge of the suitability of a particular soil for a particular form of production. The information of the different soil areas on the field are mapped and tracked for fertilising/harvesting through precision using the satellites. ✓

(Any 2 x 2) = (4)

##### 3.1.3 Increasing land productivity with regard to farming:

- Improving soil fertility: ✓ Opportunities for increasing yields include the correct use of fertiliser as it allows higher yields per unit area. Improved soil fertility and therefor land productivity can also be achieved by combining grains and leguminous crops. ✓
- Improving water management: ✓ Improving the capacity of the soil to hold water can be achieved by improving soil organic matter levels and making use of water harvesting practices. ✓
- Changing cropping practices and farming systems: ✓ Double or multiple cropping involves growing a summer crop and a winter crop in rotation in the same piece of land. It is only possible where there is water available for irrigation in the dry season. ✓
- Restoring land potential: ✓ To restore the condition of the land by reversing the degradation process. This can be achieved by halting soil erosion. ✓
- Farming land more efficiently: ✓ Consolidate small, uneconomical land units so that they can be managed more efficiently. ✓

(Any 2 x 1) = (2)



### 3.1.4 Ways in which indigenous knowledge can assist with the conservation of farming land:

A productive farm, according to many farmers in developing nations, ✓ is one that produces the majority of the resources necessary for the farmer and his family to exist, ✓ such as food, fuel, fibre for making cloth, leather, and medicinal plants. ✓ Since the farmer has experience, knowledge passed down from previous generations, ✓ and traditional knowledge about what to plant and which animals to retain, ✓ indigenous knowledge frequently plays a significant part in farming. ✓ Such a farm helps to maintain and feed a community while ensuring food security. ✓

(Any 2) (2)

## 3.2 Farm labour

### 3.2.1 Ways to solve the shortage of labour:

- Improve salaries. ✓
- Improve the living conditions. ✓
- Provide incentives and bonuses ✓
- Well-negotiated contracts are important. ✓
- Secure housing must be provided with clean water and nutritious food. ✓
- Energy in the form of wood and paraffin or electricity is essential. ✓
- Workers should belong to medical aid schemes to help keep them healthy and productive. ✓
- They also need paid leave to revitalise themselves. ✓
- Schooling (including transport) should be provided for their children. ✓
- (Any 4)

(4)

### 3.2.2 Difference between permanent and temporary labourers:

**Permanent** or **fixed** labour refers to farm workers that are employed on the farm throughout the year. ✓ They usually live on the farm ✓ and have certain rights and privileges, ✓ such as housing and food rations. ✓ Most permanent labourers are skilled. ✓

(Any 2)

**Temporary** or **part-time** labour refers to farm workers that do not stay permanently ✓ on the farm and do not work throughout the year. There are two types of part-time labourers: Seasonal labourers – they are employed during a particular season or at peak periods ✓ to perform a particular task ✓ such as harvesting, pruning or weeding. ✓ These are repetitive tasks. ✓ Casual labourers – they are employed to do a particular task such as fencing or building. ✓ The tasks they perform are non-repetitive tasks. ✓

(Any 2)

(4)



### 3.2.3 Lack of skilled labour:

- Skilled labour ensures the maximum output - low wages chase skilled people out of the farming industry. ✓
- The farm industry is competing with the industries for skilled labour. ✓
- Most labourers are poorly educated and they lack training. ✓
- Modern farming methods such as precision farming is sophisticated and require skilled labourers - therefore the agricultural sector needs life-long learning programmes to ensure that labourers' skills are up to date. ✓

(Any 2)

(2)

### 3.3 Farmer Smith's budget:

| Expenses:                         | Amount (R) |
|-----------------------------------|------------|
| Bought 2000 chicks @ R8 each      | 16 000     |
| Paid for labour                   | 20 000     |
| Bought chicken feed               | 21 000     |
| Paid for water                    | 5 000      |
| Bought vaccines                   | 2 500      |
| Paid for holiday from investments | 12 000     |
| Income:                           |            |
| Sold chicken manure               | 28 000     |

#### 3.3.1 ✓✓for correct budget

Expenses: R76 500,00 ✓

Income: R28 000,00✓

(4)

#### 3.3.2 Calculating profit:

No profit: ✓ big loss of R48 500,00 ✓

(2)

#### 3.3.3 Reason for viability of business:

No, ✓ the expenses are far greater than the income.✓

(2)

### 3.4 Farm management

#### 3.4.1 Reasons why a farming business is different from management of a grocery shop:

- The kind and daily duties involved when managing a poultry farm. ✓
- The management of layers involved in farming. ✓
- Specific skills needed for different farming operations. ✓
- (Any 2)

(2)



### 3.4.2 Specific management skills:

- a) Financial management ✓
- b) Labour management ✓
- c) Crises management ✓

(3 x 1) = (3)

### 3.4.3 Production risks in crop production:

- Weather hazards/drought/hail/storm ✓
- Pests/rodents ✓
- Fire ✓
- Equipment breakdown ✓
- (Any 2)

(2)

**[35]**



## QUESTION 4: BASIC AGRICULTURAL GENETICS

### 4.1 Punnet square

4.1.1 Punnet square for crossing of the two cultivars:

| Gametes | A  | a  |
|---------|----|----|
| a       | Aa | aa |
| a       | Aa | aa |

#### Rubric

| CRITERIA                              | MARK ALLOCATION |
|---------------------------------------|-----------------|
| Heterozygous gametes placed correctly | 1               |
| Homozygous gametes placed correctly   | 1               |
| 50% offspring Aa / Both Aa visible    | 1               |
| 50% offspring aa / Both aa visible    | 1               |
| <b>TOTAL</b>                          | <b>4</b>        |

(4)

### 4.1.2 Definition of concepts

- Genotype** – the genetic make-up /code/alleles/composition of an organism. ✓✓
- Recessive gene** – gene that is overshadowed/dominated in a crossing by another factor/gene and becomes less visible/hidden/does not express itself in the offspring. ✓✓

(2)

### 4.1.3 Characteristics of genetically modified maize:

- Pest resistance ✓
- Herbicide resistance ✓
- Drought resistance ✓
- Adaptability to environmental conditions ✓
- Disease resistance ✓
- Early maturing to escape harsh conditions
- Longer period of keeping germination ability ✓
- (Any 2)

(2)

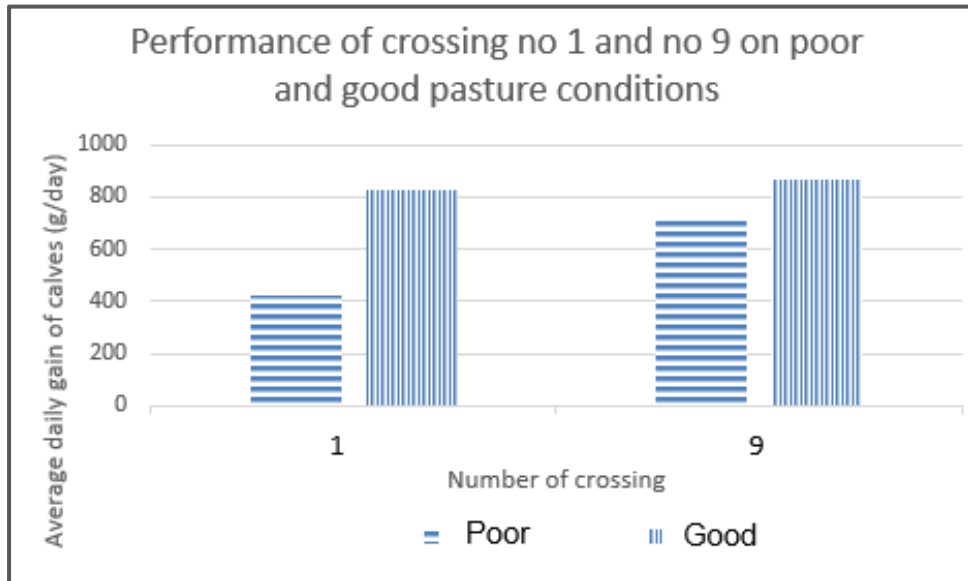


## 4.2 Breeding methods and performance

### 4.2.1 Crossbreeding ✓

(1)

### 4.2.2



| CRITERIA                          | MARK ALLOCATION |
|-----------------------------------|-----------------|
| Bar graph                         | 1               |
| Correct heading                   | 1               |
| x-axis correct and labelled       | 1               |
| y-axis correct scale and labelled | 1               |
| Accurate plotting of bars         | 1               |
| Correct units (g/day)             | 1               |

(6)

## 4.3 Selection and heritability

### 4.3.1 Selection

- Is choosing of individuals for breeding purposes ✓ due to superior characteristics. ✓

(2)

#### Heritability

- Is the degree to which the characteristics are determined ✓ by genetic Factors. ✓

(2)

### 4.3.2 TWO advantages of species crossing:

- They are hardy animals ✓
- They are drought animals ✓
- They are highly durable ✓
- (Any 2)

(2)



#### 4.3.3 Importance of using estimated breeding values in breeding:

- It indicates the heritability of a particular characteristic. ✓
  - To predict the success of a breeding program. ✓
- (2)

#### 4.4 Genetically modified organisms

##### 4.4.1 TWO aims of genetic modification of plants:

- Indirectly improving crop yield by making it easier to manage pests, diseases and weeds that can interbreed. ✓
  - Directly improving crop yield by improving tolerance to extreme environmental conditions. ✓
  - Improving commercial properties, such as flavour and shelf-life. ✓
  - Increasing the nutritional value of crops (biofortification). ✓
  - Producing pharmaceutical crops that produce proteins, drugs and vaccines for humans. ✓
  - (Any 2)
- (2)

##### 4.4.2 TWO advantages of genetic modification over traditional methods:

- GMO is faster. ✓
  - It is precise. ✓
  - It is not limited to crossing species. ✓
  - Genes from a micro-organism can be transferred to the DNA of a plant and the other way around. ✓
  - (Any 2)
- (2)

##### 4.4.3 TWO disadvantages of inbreeding:

- Expert knowledge needed as it can be a complicated method. ✓
  - No certainty that a superior inbred line with outstanding traits will be produced. ✓
  - Bad characteristics may become so fixed that they cannot be bred out. ✓
  - Reduced vigour and production. ✓
  - Deformed animals occur more frequently. ✓
  - Inbreeding depression may occur. ✓
  - Leads to decrease in variation. ✓
  - (Any 2)
- (2)



#### 4.4.4 Distinguish between pedigree selection and progeny selection.

- **Pedigree selection**

It is a selection based on the records of an individual's ancestors on both the mother's and father's side. ✓✓

- **Progeny selection**

Selection of individuals based on the records of their offspring. ✓✓ (4)

[35]

**TOTAL SECTION B: [105]**

**GRAND TOTAL: [150]**