



# basic education

Department:  
Basic Education  
**REPUBLIC OF SOUTH AFRICA**

## **NATIONAL SENIOR CERTIFICATE**

**GRADE 12**

**AGRICULTURAL SCIENCES P2**

**FEBRUARY/MARCH 2018**

**MARKING GUIDELINES**

**MARKS: 150**

**These marking guidelines consist of 10 pages.**

**SECTION A****QUESTION 1**

|                         |        |  |           |      |
|-------------------------|--------|--|-----------|------|
| 1.1                     | 1.1.1  | A ✓✓   | (10 x 2)  | (20) |
|                         | 1.1.2  | C ✓✓   |           |      |
|                         | 1.1.3  | D ✓✓   |           |      |
|                         | 1.1.4  | B ✓✓   |           |      |
|                         | 1.1.5  | D ✓✓   |           |      |
|                         | 1.1.6  | B ✓✓   |           |      |
|                         | 1.1.7  | A ✓✓   |           |      |
|                         | 1.1.8  | C ✓✓   |           |      |
|                         | 1.1.9  | D ✓✓   |           |      |
|                         | 1.1.10 | A ✓✓   |           |      |
| 1.2                     | 1.2.1  | G ✓✓   | (5 x 2)   | (10) |
|                         | 1.2.2  | A ✓✓   |           |      |
|                         | 1.2.3  | C ✓✓   |           |      |
|                         | 1.2.4  | D ✓✓   |           |      |
|                         | 1.2.5  | H ✓✓   |           |      |
| 1.3                     | 1.3.1  | Innovation/creativity ✓✓                         | (5 x 2)   | (10) |
|                         | 1.3.2  | Budget ✓✓  |           |      |
|                         | 1.3.3  | Multiple alleles ✓✓                              |           |      |
|                         | 1.3.4  | Family selection ✓✓                              |           |      |
|                         | 1.3.5  | Genetic modification/engineering/manipulation ✓✓ |           |      |
| 1.4                     | 1.4.1  | Co-operative ✓                                   | (5 x 1)   | (5)  |
|                         | 1.4.2  | Occupational Health and Safety ✓                 |           |      |
|                         | 1.4.3  | Species crossing ✓                               |           |      |
|                         | 1.4.4  | Heterozygosity ✓                                 |           |      |
|                         | 1.4.5  | Gene ✓   |           |      |
| <b>TOTAL SECTION A:</b> |        |  | <b>45</b> |      |

**SECTION B****QUESTION 2: AGRICULTURAL MANAGEMENT AND MARKETING****2.1 Table on marketing**

- 2.1.1 **Marketing system used**  
**Farmer A** - Free marketing ✓ (1)  
**Farmer B** - Controlled marketing ✓ (1)

- 2.1.2 **Reason for the system used by farmer B**  
 Price is determined/controlled by the government ✓ (1)

- 2.1.3 **Justification for mass marketing**  
 Farmer B is reaching a wide range of consumers(larger markets) via the internet ✓ (1)

- 2.1.4 **TWO ways to facilitate marketing in rural areas**
- Improve roads/infrastructure ✓
  - Improve market information through technology ✓
  - Transportation of produce in vehicles with cooling facilities. ✓
  - Cold storage depots ✓
  - Market collectively by combining loads ✓ (Any 2) (2)

- 2.2 **TWO roles of legislation in ensuring effective marketing**
- Ensures increased market access to all participants ✓
  - Makes provision for quality control over imports and exports of products ✓ (2)

**2.3 Component of a business plan**

- 2.3.1 Title/cover page ✓ (1)

- 2.3.2 Human resource plan ✓ (1)

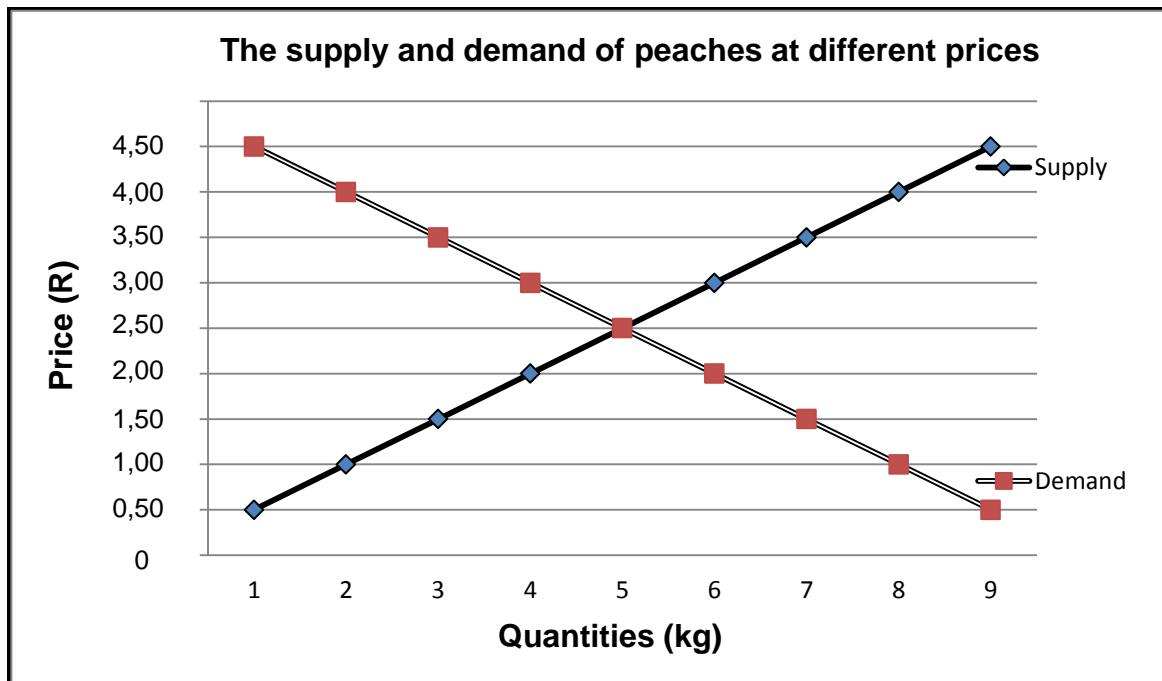
- 2.3.3 Financial plan ✓ (1)

**2.4 THREE common mistakes when drawing a business plan**

- Provision of unrealistic assumptions/over-ambitious ✓
- Not being able to identify the potential risks/hiding risks ✓
- Provision of too much unnecessary information/leaving gaps/being too vague ✓
- Committing budget and cash flow errors/incomplete financials ✓
- No information on competitors/not highlighting competition ✓
- Use of incorrect format/poor writing/incomplete plan ✓
- Inadequate/poor research ✓
- Insufficient technical details ✓ (Any 3) (3)

2.5 Supply and demand of peaches

2.5.1 Line graph showing the supply and demand of peaches



**Criteria/rubric/marketing guidelines**

- Correct heading ✓
  - X axis - correctly calibrated and labelled (Quantities) ✓
  - Y axis - correctly calibrated and labelled (Price) ✓
  - Correct unit (R and kg) ✓
  - Line graph ✓
  - Accuracy ✓
- (6)

2.5.2 Determination of the equilibrium price

R2,50 ✓ (1)

2.5.3 Situation when price is below the equilibrium price

- The quantity demanded is high ✓ and the quantity supplied is low ✓
  - OR**
  - Quantity supplied is low ✓ and quantity demanded is high ✓
- (2)

2.6 Linking statements to factors hampering marketing of products

2.6.1 Perishability ✓ (1)

2.6.2 Political situation ✓ (1)

2.6.3 Lack of control over production ✓ (1)

2.6.4 Bulkiness ✓ (1)

- 2.7 **THREE requirements of a container for packaging**
- It must be clean/dry/undamaged ✓
  - Not import any foreign taste/odour to the product ✓
  - It must be free from signs of fungal growth ✓
  - It must be strong/rigid ✓
- (Any 3) (3)
- 2.8 **Type of consumers**
- 2.8.1 Retailers ✓ (1)
- 2.8.2 Food processing companies/factories ✓ (1)
- 2.8.3 Exporters ✓ (1)
- 2.9 **The law of demand**
- The higher the price ✓ the less the people/consumers will demand the product ✓
- OR**
- The lesser the price ✓ the more the people/consumers will buy the product ✓
- (2)  
**[35]**

### QUESTION 3 : PRODUCTION FACTORS

- 3.1 **Two groups of farmers**
- 3.1.1 **Factor of land addressed by the two scenarios**  
Land availability/ area of production ✓ (1)
- 3.1.2 **TWO benefits of the practices by Group B contributing to higher production**
- Able to work on a large area faster ✓
  - Use of machinery is more effective ✓
  - More cost effective to produce ✓
  - Specialisation ✓
- (Any 2) (2)
- 3.1.3 **TWO techniques for Group A that can improve production**
- Use of scientific methods/technology ✓
  - Consolidation of small units ✓
- (2)
- 3.1.4 **Economic characteristic negatively affected by monoculture and continuous cultivation**  
Production potential of the land ✓ (1)
- 3.1.5 **TWO functions of land as a production factor**
- Provides food ✓
  - Provides raw materials ✓
  - Provides space ✓
  - Source of raw minerals ✓
- (Any 2) (2)

### 3.2 Highly ethical and efficient work force

- 3.2.1 **The type of permanent labour who operates an advanced tractor**  
Skilled labour ✓ (1)
- 3.2.2 **Indication of the expertise needed by the employee**  
Technical/operational ✓ (1)
- 3.2.3 **Act of misconduct**  
Sleeping on duty ✓ (1)
- 3.2.4 **Legislation that the employer would use to justify disciplinary steps**  
Basic Conditions of Employment Act 75 of 1997 ✓ (1)
- 3.2.5 **TWO problems related to farm labour**
- Social/HIV and AIDS ✓
  - Scarcity ✓
  - Employers' concerns ✓
  - Competition from industries/economic migrants ✓
  - Lack of training/ education ✓
  - Poor labour management ✓
  - Safety ✓
  - Poor working conditions ✓ (Any 2) (2)
- 3.2.6 **TWO actions an employer should take**
- Provide incentives ✓
  - Rewards for good work ✓
  - Provide training/education ✓
  - Improve working conditions ✓
  - Improved living conditions ✓
  - Mechanisation ✓
  - Labour management ✓ (Any 2) (2)
- 3.3 **Management**
- 3.3.1 **Risk management strategy**  
Diversification ✓ (1)
- 3.3.2 **Reason for the management strategy**  
There are a number of enterprises in one farm/agri-tourism ✓ (1)
- 3.3.3 **TWO primary sources of risk in a farming business**
- Technical ✓
  - Market/price ✓
  - Financial ✓
  - Production ✓
  - Legal ✓
  - Human resources ✓ (Any 2) (2)

- 3.3.4 **General business management skills applied by the manager**
- (a) Co-ordination/organisational ✓ (1)
  - (b) Analytic skills ✓ (1)
  - (c) Interpersonal/communication ✓ (1)
- 3.3.5 **Definition of strategic management**  
Management that allows the business to anticipate ✓ and adapt to changes in the future ✓
- OR**
- The process of developing strategies that allow a business to achieve its vision, mission and objectives ✓ and adapt to changing conditions ✓ (2)
- 3.4 **Capital**
- 3.4.1 **Fixed capital**  
Land ✓ (1)
- 3.4.2 **TWO sources of capital**
- Grant ✓
  - Loan ✓ (2)
- 3.4.3 **Problem of capital**  
Scarcity ✓ (1)
- 3.4.4 **Term of repayment**  
Medium term/5 years ✓ (1)
- 3.4.5 **Calculation of the profit made by the community in 5 years**
- Turnover:  $R12\ 000\ 000 \times 5 = R60\ 000\ 000$  ✓
  - Expenses:  $R4\ 000\ 000 \times 5 = R20\ 000\ 000$  ✓
  - Interest:  $R2\ 000\ 000 \times 5\% = R100\ 000$  ✓
  - $R2\ 000\ 000 + R100\ 000 = R2\ 100\ 000$  ✓
  - Turnover – expenses:  
 $R60\ 000\ 000 - R20\ 000\ 000 - R2\ 100\ 000 =$
  - Profit:  $R37\ 900\ 000$  ✓ (5)
- [35]**

**QUESTION 4: BASIC AGRICULTURAL GENETICS****4.1 Heterozygous pea plant (G) and a pure breed pea plant (g)****4.1.1 Genotype of each parent in the first crossing**

- Parent 1 - Gg ✓
- Parent 2 - gg ✓

**4.1.2 Punnett square determining the possible genotype of the offspring in the first crossing**

|         |    |      |
|---------|----|------|
| Gametes | G  | g ✓  |
| g       | Gg | gg ✓ |
| g       | Gg | gg   |

Punnett square with gametes and offspring ✓

**Marking Guideline**

- Complete Punnett square with gametes and offspring ✓
- Correct gametes ✓
- Correct offspring ✓

**4.1.3 Type of dominance in the cross**

Complete dominance ✓ (1)

**4.1.4 Reason for the type of dominance**

50% of the seeds are yellow (G) ✓ and 50% of the seeds are green (g) ✓

**OR**

No intermediate/new colour ✓ as seeds resemble their parents ✓ (2)

**4.1.5 Calculation of the percentage of heterozygous offspring**

$$\frac{2}{4} \times 100 \checkmark$$

$$= 50\% \checkmark$$

**4.2 Identification of the breeding system**

4.2.1 B ✓ (1)

4.2.2 A ✓ (1)

4.2.3 D ✓ (1)

4.2.4 C ✓ (1)

4.2.5 A ✓ (1)



**4.3 Variation****4.3.1 TWO genetic processes causing variation**

- Mutations ✓
- Meiosis/crossing over ✓
- Recombination of genes ✓
- Fertilisation ✓

(Any 2) (2)

**4.3.2 TWO importance of variation**

- Animals/plants with superior characteristics can be selected for breeding purposes ✓
- Helps to improve the progeny/offspring ✓
- Generate new varieties/ breeds/cultivars ✓
- Maintains biodiversity ✓

(Any 2) (2)

**4.3.3 Distinction between Continuous variation**

- Displays a complete range of quantitative characteristics ✓

(1)

**Discontinuous variation**

- Qualitative characteristics have a few clear cut/distinct forms/with no intermediate forms in between ✓

(1)

**4.4 Selection****4.4.1 Group of cattle to be selected**

Group with a mass of 250 kg ✓

(1)

**4.4.2 Reason**

It has a higher average mass/average mass higher than the herd ✓

(1)

**4.4.3 Identification of the type of selection method**

Mass selection ✓

(1)

**4.4.4 Explanation of this selection method**

- Selection based on the individuals with superior characteristics ✓ within the group ✓

(2)

**4.4.5 TWO other selection methods**

- Family selection ✓
- Pedigree selection ✓
- Progeny selection ✓
- Breeding values/EBV/biometrics ✓

(Any 2) (2)

**4.5 GM****4.5.1 Identification of the year**

2012/2013 ✓

(1)

**4.5.2 Reason**

An increase in yield/from 10,6 – 12t/ha ✓

(1)

- 4.5.3 **TWO advantages that Farmer B got from using GM maize**
- Yields increased ✓
  - Increase started from 2012 ✓
- (2)
- 4.5.4 **TWO important characteristics of GM maize crops**
- Resistant to herbicides ✓
  - Not affected by insecticides ✓
  - Crops have lower water requirements ✓
  - Better adapted to the environment/region ✓
- (Any 2) (2)
- 4.5.5 **Reason for the resistance against the use of GM's**
- Health risks ✓
  - Environmental risks ✓
  - Ethical/socio-economic concerns ✓
- (Any 1) (1)
- [35]**
- TOTAL SECTION B: 105**  
**GRAND TOTAL: 150**