**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 ✓✓
        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 ✓✓   (10 x 2)   (20)

1.2   1.2.1   G ✓✓
        1.2.2   A ✓✓
        1.2.3   C ✓✓
        1.2.4   D ✓✓
        1.2.5   H ✓✓   (5 x 2)   (10)

1.3   1.3.1   Innovation/creativity ✓✓
        1.3.2   Budget ✓✓
        1.3.3   Multiple alleles ✓✓
        1.3.4   Family selection ✓✓
        1.3.5   Genetic modification/engineering/manipulation ✓✓   (5 x 2)   (10)

1.4   1.4.1   Co-operative ✓
        1.4.2   Occupational Health and Safety ✓
        1.4.3   Species crossing ✓
        1.4.4   Heterozygosity ✓
        1.4.5   Gene ✓   (5 x 1)   (5)

TOTAL SECTION A: 45

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)   (1)
                via the internet ✓

        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

The supply and demand of peaches at different prices
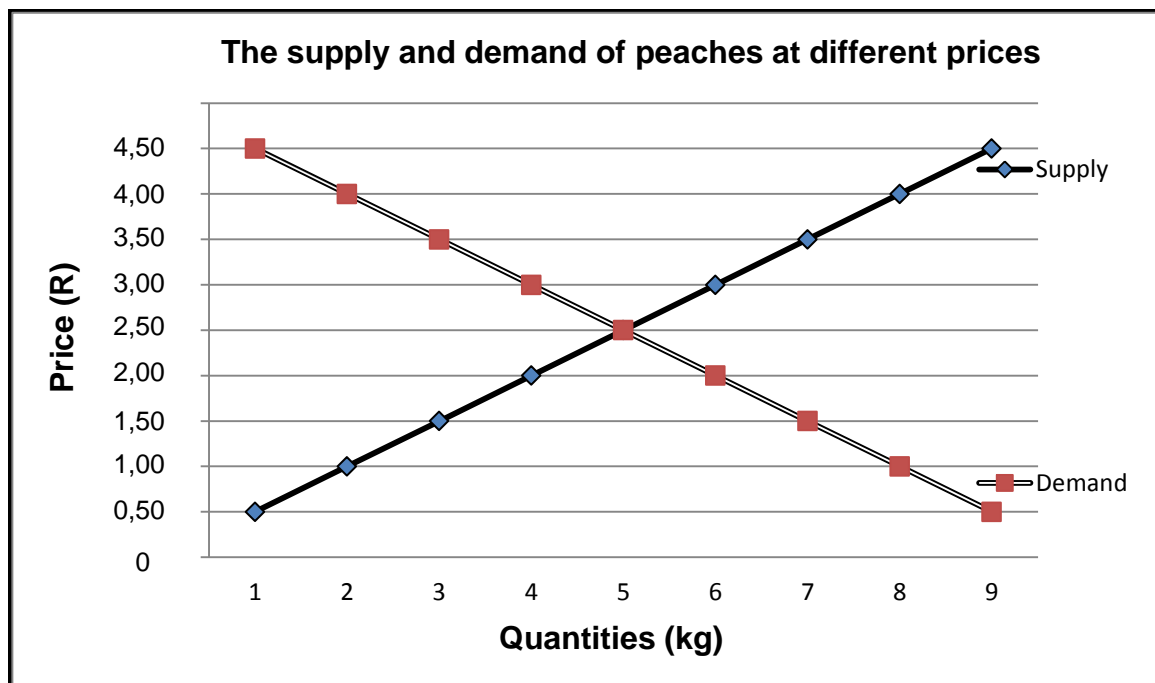
Criteria/rubric/marking guidelines
- Correct heading ✓
- X axis - correctly calibrated and labelled (Quantities) ✓
- Y axis - correctly calibrated and labelled (Price) ✓
- Correct unit (R and kg) ✓
- Line graph ✓
- Accuracy ✓   (6)

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)

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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 x 5 = R60 000 000 ✓
- Expenses: R4 000 000 x 5 = R20 000 000 ✓
  Interest: R2 000 000 x 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)
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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 ✓   (2)

        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 ✓   (3)

        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**
$\frac{2}{4}$ x 100 ✓
= 50% ✓   (2)

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/from10,6 – 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)
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TOTAL SECTION B: 105
GRAND TOTAL: 150