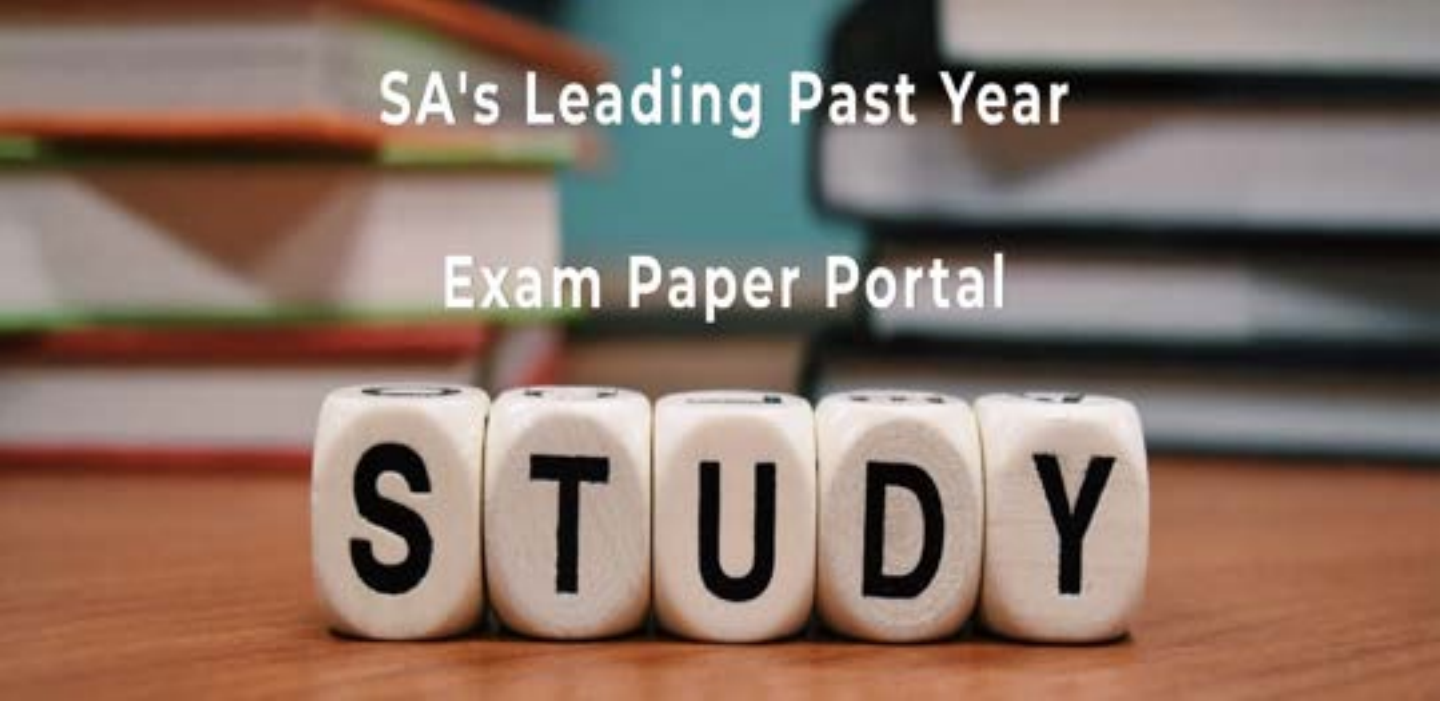

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GRADE 12

AGRICULTURAL SCIENCES P2

NOVEMBER 2019

MARKING GUIDELINES

MARKS: 150

These marking guidelines consist of 10 pages.

SECTION A

QUESTION 1

1.1	1.1.1	C ✓✓		
	1.1.2	D ✓✓		
	1.1.3	C ✓✓		
	1.1.4	D ✓✓		
	1.1.5	B ✓✓		
	1.1.6	A ✓✓		
	1.1.7	A ✓✓		
	1.1.8	B ✓✓		
	1.1.9	C ✓✓		
	1.1.10	B ✓✓	(10 x 2)	(20)
1.2	1.2.1	H ✓✓		
	1.2.2	E ✓✓		
	1.2.3	D ✓✓		
	1.2.4	A ✓✓		
	1.2.5	C ✓✓	(5 x 2)	(10)
1.3	1.3.1	Niche marketing ✓✓		
	1.3.2	Planning ✓✓		
	1.3.3	Biometrics/biostatistics ✓✓		
	1.3.4	Multiple alleles ✓✓		
	1.3.5	Transgenic/GMO ✓✓	(5 x 2)	(10)
1.4	1.4.1	Entrepreneur/agripreneur ✓		
	1.4.2	Undercapitalisation ✓		
	1.4.3	Gene gun ✓		
	1.4.4	Epistasis ✓		
	1.4.5	Heritability ✓	(5 x 1)	(5)

TOTAL SECTION A: 45

SECTION B

QUESTION 2: AGRICULTURAL MANAGEMENT AND MARKETING

2.1 Business plan

2.1.1 TWO reasons for drawing a business plan

- Test the feasibility/economic viability of the enterprise ✓
- Determine the financial needs of the enterprise ✓
- To secure funding/attract investors ✓
- To ensure effective business management ✓
- To foresee problems ✓
- Gain knowledge of marketing opportunities/competitors ✓
- Repositioning of the enterprise/analysis of the business ✓
- Guide daily operations/outlines roles and responsibilities ✓
- Mapping out the objectives/goals of the enterprise ✓
- Provide information on internal/external business environment ✓
- Provide guidelines for decision making ✓ (Any 2) (2)

2.1.2 TWO factors to be considered when developing a market

- Consumers/customers ✓
- Competitors ✓
- Market requirements/conditions ✓
- Target markets ✓
- Number of products ✓
- Investors' wants ✓
- Price ✓
- Promotion ✓
- Placement/distribution ✓ (Any 2) (2)

2.2 A subsistence farmer producing watermelons and spinach

2.2.1 TWO factors the farmer needs to consider when setting prices

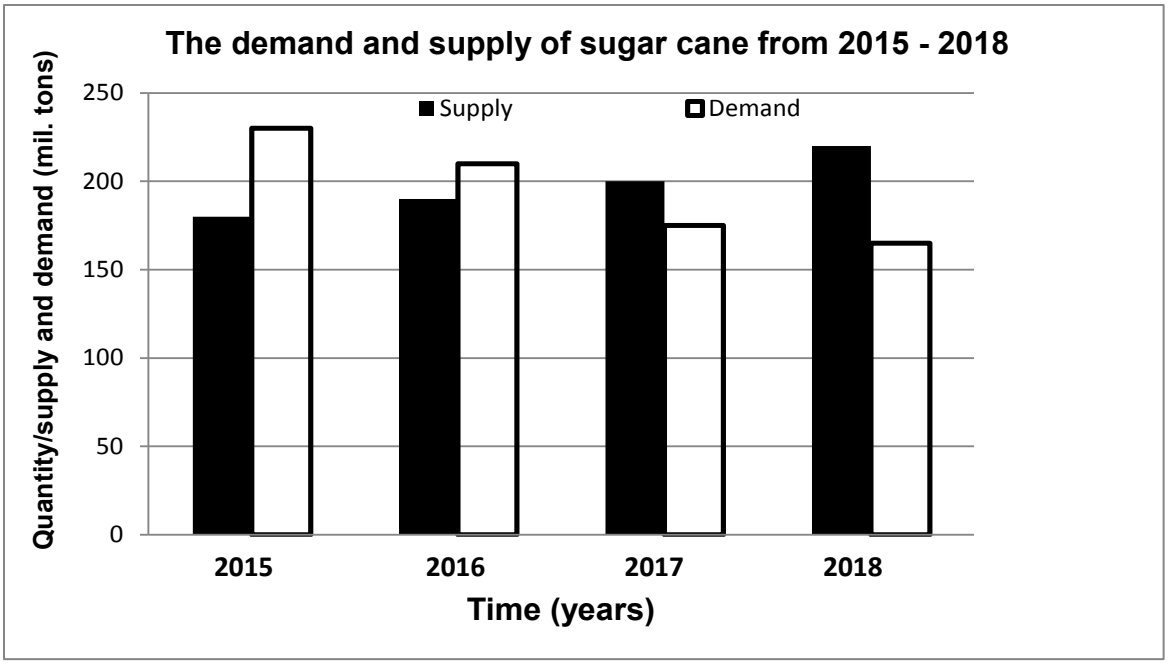
- Costs ✓
- Demand ✓
- Supply ✓
- Competition/going rate ✓
- Profit margins ✓
- Quality/grading ✓
- Specific market ✓ (Any 2) (2)

2.2.2 TWO ways to promote produce

- Advertisement/branding ✓
- In-store promotion/specials/discounts ✓
- Direct mailing ✓
- Trade fares and exhibition ✓
- Personal selling ✓
- Online/internet/social media marketing ✓
- Sponsorships ✓
- Posters/flyers/brochures/billboards ✓ (Any 2) (2)

2.3 Bar graph on the supply and demand of sugar cane

2.3.1 Bar graph on the supply and demand of sugar cane



CRITERIA/RUBRIC/MARKING GUIDELINES

- Correct heading ✓
- X axis: Correctly calibrated with label (Time/years) ✓
- Y axis: Correctly calibrated with label (Quantity/supply and demand) ✓
- Correct units (Million ton) ✓
- Bar graph ✓
- Accuracy ✓ (6)

2.3.2 Relationship between the supply and demand of sugar cane from 2015 to 2018

- From 2015 to 2018 sugar cane supply increased ✓
- while the demand thereof decreased ✓ (2)

2.4 The entrepreneurial process

Phases of the entrepreneurial processes

A - Identify an opportunity/generate a business idea ✓ (1)
B - Plan the business/developing a business plan ✓ (1)
C - Establish/start the business ✓ (1)

2.5 Marketing concepts

2.5.1 Marketing functions

(a) Packaging ✓ (1)
(b) Storage ✓ (1)
(c) Processing/value adding ✓ (1)

2.5.2 **Advantages of processing agricultural products**

- Prevents spoilage/increases shelf-life of products ✓
- The product is available throughout the year ✓
- Improves food safety by heating to sufficient temperatures ✓
- Easy to transport ✓
- Convenience ✓
- Adds value to farm products/increases the value of products ✓
- It provides job opportunities ✓
- Reduces wastage of excess produce ✓
- It allows for easier packaging and handling of products ✓
- It is a way of overcoming over-supply of products ✓
- Expanding/extending the market ✓ (Any 2) (2)

2.6 **Marketing channels**

2.6.1 **Marketing channels**

(a) Farm gate marketing ✓ (1)
(b) Stock sales ✓ (1)
(c) Internet marketing ✓ (1)

2.6.2 **TWO disadvantages of a free marketing system**

- Prices fluctuate ✓
- Market costs are high/takes place on small scale ✓
- Producer is responsible for marketing/nobody to produce ✓
- Limited bargaining power ✓
- High risk as many things can go wrong ✓
- Cartels formed and consumers are exploited/price fixing ✓
- Agents lead to smaller profits ✓
- Competition ✓
- Over production can lead to big surpluses ✓
- Foreign countries dump over produced produce ✓ (Any 2) (2)

2.7 **Equilibrium price for an agricultural product**

2.7.1 **Identification of the lines**

A - Demand ✓ (1)
B - Supply ✓ (1)

2.7.2 **Definition of the concept equilibrium price**

When the price ✓ of a product settles at the point where the demand is equal to supply ✓ (2)

2.7.3 **TWO factors affecting the demand**

- Consumer income/sociological factors ✓
- The number of consumers ✓
- The tastes and preferences of consumers ✓
- Competing/substitute goods ✓
- Complementary goods ✓
- The usefulness of the product ✓
- The range of products available to consumers ✓
- Season ✓
- Quality of the product ✓
- Advertising ✓ (Any 2) (2)

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QUESTION 3: PRODUCTION FACTORS

3.1 **Illustration of the different skills of a farmer and farm worker**

3.1.1 **Identification of the production factor represented by the graph**
Management ✓ (1)

3.1.2 **TWO other management skills important for a successful farmer**

- General business management skills ✓
- Interpersonal/communication ✓
- Decision-making ✓
- Production/operational ✓ (Any 2) (2)

3.1.3 **Comparison of the skills C and D of farmer and farm worker**

SKILLS	FARMER	FARM WORKER
Problem Solving **(C)**	Has 95%/higher capability to come up with solutions to problems ✓	Has 40%/lower capability to come up with solutions to problems ✓
Technical **(D)**	Has 40%/lower capability of technical skills ✓	Has 100%/higher capability of technical skills ✓

(4)

3.2 **Income statement**

3.2.1 **Identification of the document**
Income statement/cash analysis book/statement ✓ (1)

3.2.2 **Identification of TWO examples of:**

(a) Fixed cost items

- Rent ✓
- Insurance ✓ (2)

(b) Variable cost items

- Manure ✓
- Transport ✓
- Fuel ✓
- Electricity ✓
- Pesticides ✓ (Any 2) (2)

3.2.3 **Calculation of the total income of tomatoes**
- Total Income = R2 800+R2 940+R2 140 ✓
- = R7 880 ✓ (2)

3.2.4 **TWO reasons for keeping financial records**
- Allows the farmer to manage capital ✓
- To draw up a budget ✓
- To plan for the future of the enterprise ✓
- To analyse past/future performance of the enterprise ✓
- To apply for loans ✓
- Provide information for tax purposes ✓
- Provide proof of payment ✓
- Monitors cash flow ✓ (Any 2) (2)

3.3 **Capital**

3.3.1 **The type of credit**
Short term loan/credit ✓ (1)

3.3.2 **Calculation of the interest**
- Interest = $\frac{11,5}{100}$ x R195 000 ✓
- = R22 425 ✓ (2)

3.3.3 **Determination of profitability of farming enterprise**
- R195 000 + R22 425 = R217 425 ✓
- R240 000 – 217 425 = R22 575 ✓
- The business is profitable/viable ✓ (3)

3.3.4 **Sustainability of the enterprise**
It is sustainable ✓ (1)

3.3.5 **Reason**
The farmer will manage to repay the loan and its interest and still remain with profit/R22 575 ✓ (1)

3.4 **Labour**

3.4.1 **Identification of the production factor**
Labour ✓ (1)

3.4.2 **Differences between casual and seasonal farm worker**
Casual worker - Employed to perform a non-repetitive work ✓ (1)
Seasonal worker - Employed to perform a repetitive work/employed during peak period ✓ (1)

3.4.3 **THREE problems associated with farm workers**

- Farm workers are scarce ✓
- Lack of training/skills/educational opportunities ✓
- Farm worker migration ✓
- Competitions with other industries ✓
- Low wages ✓
- Lack of opportunities/promotion ✓
- Dreadful diseases/HIV/AIDS/TB ✓
- Poor labour management ✓
- Social problems ✓
- Poor working conditions/safety ✓
- Labour unrests/strikes ✓
- Lack of benefits ✓
- Workers not working regularly ✓ (Any 3) (3)

3.5 **Land**

3.5.1 **Explanation of the Law of diminishing returns as an economic characteristic of land**

- With an increase in a specific input the output will be proportionally higher ✓
- until it reaches a stage of maximum output ✓
- thereafter output will decline even with a higher input ✓ (3)

3.5.2 **TWO functions of Land**

- Land provides space/area ✓
- Land supplies raw materials ✓
- Land supplies minerals ✓
- Land supplies food/food security ✓
- Use as collateral/security ✓ (Any 2) (2)

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QUESTION 4: BASIC AGRICULTURAL GENETICS

4.1 **A pure-breed black cow is crossed with a pure-breed red bull**

4.1.1 **Indication of the dominant colour**
Black ✓ (1)

4.1.2 **Justification of the answer in QUESTION 4.1.1**
All the F_1 offspring have black colour/black dominant over red ✓ (1)

4.1.3 **Determination of the**

(a) Genotype of a cow - BB ✓ (1)

(b) Genotype of the offspring - Bb ✓ (1)

4.2 **Dihybrid crossing**

4.2.1 **Identification of the type of crossing**
Dihybrid crossing ✓ (1)

4.2.2 **Reason for the answer in QUESTION 4.2.1**
This crossing involves two different characteristics/texture and colour ✓ (1)

4.2.3 **Determination of any TWO possible phenotypes of the F_1**
- Green rough ✓
- Green smooth ✓
- Yellow rough ✓
- Yellow smooth ✓ (Any 2) (2)

4.2.4 **Calculation of the percentage of offspring with yellow and smooth fruits**
- $\frac{1}{16}$ x 100 ✓
- = 6,25% ✓ (2)

4.3 **Differences in the characteristics between members of the same species**

4.3.1 **Term for the phenomenon in the statement**
Variation ✓ (1)

4.3.2 **TWO environmental factors that can have an effect on variation**
- Nutrition/diet/feeding ✓
- Climate (light intensity/temperature/rainfall) ✓
- Diseases/pests ✓
- Topography/altitude ✓
- Soil factors ✓
- Management/shelter/exercise and space ✓ (Any 2) (2)

4.3.3 **TWO types of selection**
- Artificial selection ✓
- Natural selection ✓ (2)

4.4 **Breeding systems**

4.4.1 **The breeding system**
Crossbreeding ✓ (1)

4.4.2 **Reason for the answer in QUESTION 4.4.2**
Different/unrelated breeds of the same species are crossed/beef breed crossed with dairy breed ✓ (1)

4.4.3 **TWO advantage of cross breeding**
- Increases genetic variation ✓
- Produce heterosis/hybrid vigor/improved performance ✓ (2)

4.4.4 **TWO disadvantages of inbreeding**
- Loss of genetic variation ✓
- Leads to inbreeding depression ✓
- Increases the expression of lethal genes/deformities/unwanted genes ✓
- Increases homozygosity ✓ (Any 2) (2)

4.5 **A homozygous brown ewe (A) and a homozygous white ram (a)**

4.5.1 **Punnet square to illustrate the F_2 generation**

♂ \ ♀	A	a
A	AA	Aa
A	AA	Aa

MARKING CRITERIA
- Correct male gametes ✓
- Correct female gametes ✓
- Correct offspring ✓
- Punnet square with gametes and offspring ✓ (4)

4.5.2 **Indication of genotypic ratio and a number of offspring**
(a) 1:1/2:2 ✓ (1)
(b) 0 ✓ (1)

4.6 **Polygenic inheritance**

4.6.1 **Determination of the genotype of the highest maize plant**
AABBDD ✓ (1)

4.6.2 **Calculation of the length of the longest maize plant**
- 40+5+5+5+5+5+5cm [40+(5x6)cm = 30cm] ✓
- = 70cm ✓ (2)

4.6.3 **TWO genotypes of maize plant that will be 55cm long**
- AABbdd/ ✓
- AaBbDd ✓
- AaBBdd ✓
- aaBBDd ✓
- aaBbDD ✓ (Any 2) (2)

4.7 **THREE techniques used to modify animals genetically**
- Retroviral vectors ✓
- Micro-injection ✓
- Embryonic stem cells ✓
- Agrobacterium tumefaciens/bacterial carriers ✓
- Viral carriers ✓
- Gene gun ✓
- Electroporation ✓
- Micro-injection ✓
- Biolistics ✓
- Calcium phosphate precipitation ✓
- Gene silencing ✓
- Gene splicing ✓
- Lipofection ✓ (Any 3) (3)

[35]

TOTAL SECTION B: 105
GRAND TOTAL: 150