basic education

Department:
Basic Education
REPUBLIC OF SOUTH AFRICA

NATIONAL SENIOR CERTIFICATE

GRADE 12

AGRICULTURAL SCIENCES P2

FEBRUARY/MARCH 2016

MEMORANDUM

MARKS: 150

This memorandum consists of 9 pages.

SECTION A

QUESTION 1

1.1	1.1.1	B ✓✓		
	1.1.2	C ✓✓		
	1.1.3	A ✓✓		
	1.1.4	C ✓✓		
	1.1.5	B ✓✓		
	1.1.6	C ✓✓		
	1.1.7	A ✓✓		
	1.1.8	D ✓✓		
	1.1.9	D ✓✓		
	1.1.10	C ✓✓	(10 x 2)	(20)
1.2	1.2.1	D ✓✓		
	1.2.2	C ✓✓		
	1.2.3	E ✓✓		
	1.2.4	A ✓✓		
	1.2.5	G ✓✓	(5 x 2)	(10)
1.3	1.3.1	Budget ✓✓		
	1.3.2	Equilibrium price ✓✓		
	1.3.3	Capital ✓✓		
	1.3.4	Biometrics ✓✓		
	1.3.5	Epistasis ✓✓	(5 x 2)	(10)
1.4	1.4.1	Marketing ✓		
	1.4.2	Technical ✓		
	1.4.3	Net Farm Income ✓		
	1.4.4	Skilled ✓		
	1.4.5	Breeding value ✓	(5 x 1)	(5)
			TOTAL SECTION A:	**45**

SECTION B

QUESTION 2: AGRICULTURAL MANAGEMENT AND MARKETING

2.1 The illustration representing marketing strategy

2.1.1 Marketing strategies

A A - Product ✓
B B - Price ✓
C C - Place ✓
D D - Promotion ✓ (4)

2.1.2 TWO factors to consider when planning a product

- Quality ✓
- Design ✓
- Branding ✓
- Packaging ✓
- Size ✓
- Warranty ✓ (Any 2) (2)

2.1.3 TWO ways to implement the strategy

- Advertising ✓
- In-store promotion ✓
- Direct mailing ✓
- Trade fairs and exhibition ✓
- Sponsorship ✓
- Personal selling ✓ (Any 2) (2)

2.1.4 TWO aspects to consider when deciding on pricing

- Cost ✓
- Demand ✓
- Competition ✓ (Any 2) (2)

2.2 Marketing system

2.2.1 Identification of the marketing system

Co-operative marketing system ✓ (1)

2.2.2 THREE advantages of co-operative marketing

- Farmers (producers) will have a better chance to negotiate a good price for their produce ✓
- They will have an access to professional expertise ✓
- They can afford better infrastructure as a group than as individuals ✓
- They can buy fertiliser or packaging material cheaper ✓
- They can develop a brand for their produce which makes them more visible to the potential buyers ✓
- They can access funding from the government as a cooperative ✓ (Any 3) (3)

2.2.3 **TWO principles of co-operative marketing**

- Voluntary membership ✓
- Democratic member control ✓
- Member's economic participation ✓
- Autonomy and independency ✓ (Any 2) (2)

2.3 **Quantities of product 1 and 2 supplied**

2.3.1 **Formulation of hypothesis**

Producers may not increase the supply of agricultural product ✓ even when the price has increased in a short period of time ✓

OR

If the price of an agricultural product increases,✓ the supply may not increase within a short period of time ✓ (2)

2.3.2 **Calculation of price elasticity of supply for product 1 and 2**

- Product 1 = $\frac{13\%}{20\%}$ ✓
  = 0,65 ✓ (2)

- Product 2 = $\frac{39\%}{20\%}$ ✓
  = 1,95 ✓ (2)

2.3.3 **Interpretation of price elasticity of supply for the two products**

- Supply for product 1 is inelastic ✓
- Supply for product 2 is elastic ✓ (2)

2.3.4 **TWO factors affecting supply of the products**

- Price ✓
- Possibilities of increasing the supply of goods/time ✓
- Technology ✓
- Production costs ✓
- Expectations of the future price ✓
- Environmental conditions ✓
- Subsidies ✓ (Any 2) (2)

2.4 SWOT analysis

2.4.1 Use of SWOT analysis to identify the following

(a) **TWO strengths**
- Availability of land ✓
- Services by an extension officer ✓
- Human resource ✓ (Any 2) (2)

(b) **ONE weakness**
- Lack of capital ✓
- Lack of skills ✓ (Any 1) (1)

(c) **ONE opportunity**
- Identified market ✓
- Services of the extension officer ✓ (Any 1) (1)

(d) **TWO threats**
- Unreliable weather ✓
- Competition from another project/Flourishing project in a nearby village ✓
- Lack of funds ✓
- Lack of skills ✓ (Any 2) (2)

2.4.2 THREE actions to correct threats
- Application of scientific methods/ use of modern technology ✓
- Establishment of sound market chain ✓
- Consider processing and value adding ✓
- Source interest free funding and subsidies ✓
- Consider training; internships and voluntary hands on experience ✓ (Any 3) (3)

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QUESTION 3: PRODUCTION FACTORS

3.1 Land as a production factor

3.1.1 TWO characteristics of land
- Land is subject to the law of diminishing return ✓
- Land is durable ✓ (2)

3.1.2 Explanation of the law of diminishing return
- More units of fertiliser ✓
- Did not result to proportional further increase the yield ✓ (2)

3.1.3 TWO functions of land from the case study
- It enables the production of food ✓
- It provides physical space for industry ✓ (2)

3.1.4 **TWO ways to increase productivity of land**
- Changing cropping systems/intercropping/adaptation to scientific methods ✓
- Restoring land potential/halting erosion ✓
- Consolidate small uneconomic land units ✓
- Improving water management/provision ✓ (Any 2) (2)

3.2 **Capital as a production factor**

3.2.1 **Explanation of the assistance of using a cash flow budget**
- It shows the flow of cash into and out of the farming operation✓
- To determine the profit and loss ✓ (2)

3.2.2 **Monthly income**
- Sale of eggs = R8 000 per week x 4 = R32 000 ✓
- Sale of broilers = R12 500 per week x 4 = R50 000 ✓
  = R32 000 + R50 000 = R82 000 ✓ (3)

3.2.3 **Decision to continue with the business**
Farmer must continue with the business ✓ (1)

3.2.4 **Reason**
- Income is more than the expenditure ✓
- The business is run at a profit. (Profit is R43 000) ✓ (2)

3.2.5 **TWO forms of capital**
- Floating/working capital ✓
- Movable capital ✓ (2)

3.3 **Ability levels of farmers and farm workers**

3.3.1 **TWO skills of farm manager based on graph**
- Planning ✓
- Entrepreneurial ✓ (2)

3.3.2 **One important skill needed by the farm worker**
Technical skill ✓ (1)

3.3.3 **Justification of skill needed by the farm worker**
- Worker needs to perform practical activities ✓
- using hands ✓ (2)

3.3.4 **TWO management skills important to the farmer other than the skills in the graph**
- Financial ✓
- Communication and interpersonal ✓
- Problem-solving ✓
- Decision-making ✓ (Any 2) (2)

3.3.5 **TWO management principles**
- Planning ✓
- Motivation ✓
- Control ✓
- Implementation ✓
- Control ✓ (Any 2) (2)

3.4 **Labour Legislation**

3.4.1 **21 days leave of absence farm employees entitled to**
Annual leave ✓ (1)

3.4.2 **4 months leave of absence female employees entitled to**
Maternity leave ✓ (1)

3.4.3 **Leave of absence for flu**
Sick leave ✓ (1)

3.5 **Labour**

3.5.1 **Calculation of worker payment during public holiday**
- R111.72 x 2 = R223.44 ✓ **OR** R111.72 x 2 x 3 ✓ = R670.32 ✓
- R223.44 x 3 = R670.32 ✓ (2)

3.5.2 **Deduction of a labour practice**
Unfair labour practice ✓ (1)

3.5.3 **Justification of answer in QUESTION 3.5.2**
- Worker underpaid/worker received R270.32 less ✓
- Public holidays are double paid according to Public Holiday Act/ allowance on public holidays is double the allowance of normal working days ✓ (2)

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QUESTION 4: BASIC AGRICULTURAL GENETICS

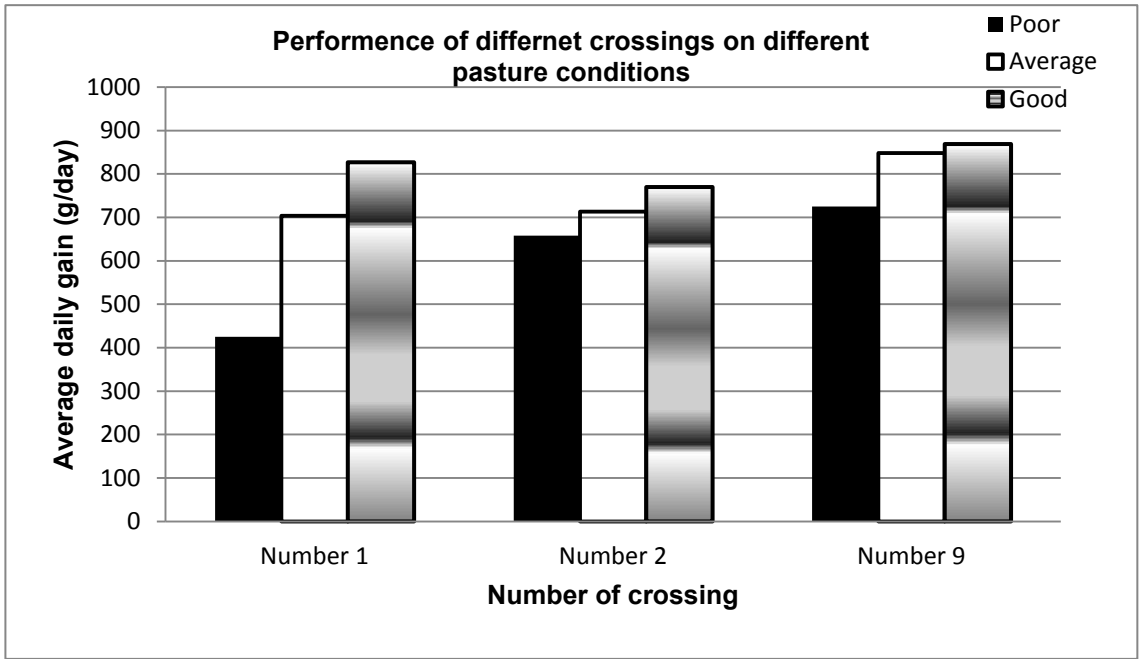
4.1 **Growth rates between cattle breeds**

4.1.1 **Type of breeding system**
Cross breeding ✓ (1)

4.1.2 **Parents that produced calves with highest average daily gain**
Hereford bulls and Brahman cows ✓ (1)

4.1.3 **TWO reasons for better performance of these calves**
- Offspring have hybrid vigour/heterosis ✓
- Are better adapted to poor veld conditions/more hardy ✓
- Have a better feed conversion rate ✓ (Any 2) (2)

4.1.4



Criteria/rubric/marking guidelines

- Correct heading ✓
- X axis - correctly calibrated and labelled (number crossing) ✓
- Y axis - correctly calibrated and labelled (ADG) ✓
- Correct units (g/day) ✓
- Accuracy ✓
- Bar graph ✓

(6)

4.2 Inheritance

4.2.1 Type of inheritance controlling milk yield

Polygenic inheritance ✓ (1)

4.2.2 Milk yield of a Jersey cow with genotype AAbb

AA = 20+ 20 = 40 litres ✓
AAbb = 200 + 40 litres ✓
= 240 litres ✓ (3)

4.2.3 Phenotypic and genotypic ratio of F1-generation

AABB x aabb
AB x ab ✓
Genotype : 4 AaBb ✓
Phenotype : all producing 240 litres ✓ (3)

4.3 Inheritance

4.3.1 The phenomenon in QUESTION 4.3

Atavism ✓ (1)

4.3.2 **Reason**
- A recessive gene for red which was switched off and not expressed ✓
- In the phenotype in the past is now switched on and expressed✓ (2)

4.3.3 **Alternative term for atavism**
Throwback ✓ (1)

4.4 **Selection and breeding**

4.4.1 **Differentiation between selection and heritability**
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)

4.4.2 **TWO advantages of a species crossing**
- They are hardy animals ✓
- They are drought animals ✓
- They are highly durable ✓ (Any 2) (2)

4.4.3 **TWO related breeding systems**
- Line breeding ✓
- Inbreeding ✓ (2)

4.4.4 **Importance of using EBV**
It indicates the heritability of a particular characteristic ✓
to predict the success of a breeding programme ✓ (2)

4.5 **Effects of mutagenic agents**

4.5.1 **Gamma and X-rays**
Damages DNA molecule and causes it to break ✓ (1)

4.5.2 **Metals**
Change the chemical structure of a DNA molecule ✓ (1)

4.5.3 **Alkaloids**
They prevent chromosome segregation ✓ (1)

4.5.4 **Viruses**
They insert their own DNA ✓ (1)
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TOTAL SECTION B: 105
GRAND TOTAL: 150