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# **basic education**

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

## **SENIOR CERTIFICATE EXAMINATIONS/ NATIONAL SENIOR CERTIFICATE EXAMINATIONS**

**AGRICULTURAL SCIENCES P2**

**2022**

**MARKING GUIDELINES**

**MARKS: 150**

**These marking guidelines consist of 11 pages.**

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

|     |        |                      |          |      |
|-----|--------|----------------------|----------|------|
| 1.1 | 1.1.1  | D ✓✓                 | (10 x 2) | (20) |
|     | 1.1.2  | D ✓✓                 |          |      |
|     | 1.1.3  | A ✓✓                 |          |      |
|     | 1.1.4  | C ✓✓                 |          |      |
|     | 1.1.5  | B ✓✓                 |          |      |
|     | 1.1.6  | B ✓✓                 |          |      |
|     | 1.1.7  | A ✓✓                 |          |      |
|     | 1.1.8  | B ✓✓                 |          |      |
|     | 1.1.9  | C ✓✓                 |          |      |
|     | 1.1.10 | C ✓✓                 |          |      |
| 1.2 | 1.2.1  | G ✓✓                 | (5 x 2)  | (10) |
|     | 1.2.2  | A ✓✓                 |          |      |
|     | 1.2.3  | H ✓✓                 |          |      |
|     | 1.2.4  | C ✓✓                 |          |      |
|     | 1.2.5  | D ✓✓                 |          |      |
| 1.3 | 1.3.1  | Price elasticity ✓✓  | (5 x 2)  | (10) |
|     | 1.3.2  | Management ✓✓        |          |      |
|     | 1.3.3  | Heredity ✓✓          |          |      |
|     | 1.3.4  | Biometrics ✓✓        |          |      |
|     | 1.3.5  | Progeny selection ✓✓ |          |      |
| 1.4 | 1.4.1  | SWOT analysis ✓      | (5 x 1)  | (5)  |
|     | 1.4.2  | Labour ✓             |          |      |
|     | 1.4.3  | Epistasis ✓          |          |      |
|     | 1.4.4  | Mutation ✓           |          |      |
|     | 1.4.5  | Chromosome ✓         |          |      |

**TOTAL SECTION A: 45**

**SECTION B****QUESTION 2: AGRICULTURAL MANAGEMENT AND MARKETING****2.1 Marketing functions****2.1.1 The main functions of marketing****B** - Storage ✓

(1)

**D** - Transportation ✓

(1)

**2.1.2 TWO guidelines for packaging**

- Product identification ✓
- Recyclability/biodegradability ✓
- Containment/easy handling ✓
- Protection ✓
- Should improve shelf life ✓
- Health risk/free from chemicals/cleanliness ✓
- Appeal to the target market ✓

(Any 2) (2)

**2.1.3 TWO advantages of processing to the consumer**

- Provides job opportunities ✓
- Easy to handle the product/convenience ✓
- Can buy farm products and keep for longer at home ✓
- Product availability in all seasons/ensures food security ✓
- Provides quality improved products ✓
- Makes the products more appealing ✓

(Any 2) (2)

**2.2 Demand and supply curves****2.2.1 The curves of demand and supply****(a) Demand** - H (F E D) ✓

(1)

**(b) Supply** - G (A B C) ✓

(1)

**2.2.2 Reason of the demand curve**

- The higher the price of a product ✓ the lower the demand ✓
- The lower the price of a product ✓ the higher the demand ✓
- There is an inverse relationship ✓ between price and demand ✓
- Has a negative/downward slope ✓ to the right ✓

(Any 1) (2)

**2.2.3 TWO factors influencing demand of agricultural products**

- Price of the product/price expectations ✓
- Quality of the product ✓
- Consumer taste and preferences ✓
- Fashion/advertising ✓
- Change in consumer income ✓
- Number of consumers ✓
- Socio-economic factors/buying power ✓
- Legislation ✓
- Research ✓
- Price of substitutes/competitive or complementary products ✓
- Festive season ✓
- Usefulness of the product ✓

(Any 2) (2)

**2.2.4 The relationship between price and supply**

- The higher the price ✓ the more the quantity supplied ✓
- The lower the price ✓ the lower the quantity supplied ✓

(Any 1) (2)

**2.3 Entrepreneurial success factors****2.3.1 Identification of the letters**

(a) C ✓

(1)

(b) A ✓

(1)

(c) B ✓

(1)

**2.4 Marketing approaches****2.4.1 Identification of the types of marketing approaches**

A - Mass marketing ✓

(1)

B - Multi-segment marketing ✓

(1)

C - Niche marketing ✓

(1)

**2.5 Marketing****2.5.1 The marketing process**

Agri-business/marketing/supply-demand chain ✓

(1)

**2.5.2 TWO costs influencing the high price at stage 4**

- Processing costs ✓
- Distribution/transportation costs ✓

(2)

**2.5.3 TWO factors hampering marketing of the product at stage 3**

- Accidents/delays ✓
- Poor infrastructure/bad roads ✓
- Theft ✓
- Perishability/spoilage/damage of the product ✓
- High cost of fuel ✓

(Any 2) (2)

**2.5.4 ONE way to streamline and improve agri-business chain**

- Improve road infrastructure ✓
- Improve access to market information ✓
- Provide storage facilities ✓
- Provide access to finance ✓
- Use cold storage and refrigerated transport ✓
- Grading/standardisation of products to facilitate marketing/pricing ✓
- Processing products close to where they are produced ✓
- Combining loads with other producers ✓

(Any 1) (1)

**2.6 Marketing channel****2.6.1 TWO advantages of fresh produce market**

- Large volumes can be sold ✓
- Farmer takes advantage of higher price in times of short supply ✓
- Farmer can employ an agent to perform the task of marketing ✓

(Any 2) (2)

**2.6.2 Justification of an agent increasing the marketing cost**

The farmer pays the commission to the agent ✓

(1)

**2.6.3 Indication of the marketing system**

Free marketing ✓

(1)

**2.7 TWO roles of legislation in agricultural marketing**

- Increases market access to all participants ✓
- Controls sale and export of perishable products ✓
- Sets and maintains national standards ✓
- Promotes food safety ✓
- Regulates market agents and improve their functioning ✓
- Promotes a fair accessible and sustainable market place for consumer products and services ✓
- Prevents unfair marketing and business practices ✓

(Any 2) (2)

**2.8 Business plan****2.8.1 Component of a business plan showing ownership of a business**

Title page ✓

(1)

**2.8.2 TWO reasons for drawing up a business plan**

- Document the business idea ✓
- Test the feasibility and economic viability of a business ✓
- Determine the financial needs of the business ✓
- Secure funding for the business ✓
- Guide daily operations ✓
- Ensure effective business management ✓
- Allow the farmer to foresee problems ✓
- Gain knowledge about marketing opportunities/competitors ✓
- Reposition the business to deal with changes in the market ✓

(Any 2)

(2)

**[35]****QUESTION 3: PRODUCTION FACTORS****3.1 Land****3.1.1 The economic characteristic of land**

The law of diminishing returns ✓

(1)

**3.1.2 Implication of the law of diminishing returns**

- Output will initially increase at an increasing rate with increase of input ✓
- A further increase in input will result in increased output at a decreasing rate ✓

(2)

**3.1.3 Output response to the inputs as it increases from**

- **5 to 10:** An input of 5 units resulted in an output of 10 units/ output increases at an increasing rate with an increase in inputs ✓
- **10 to 15:** An input of 5 units resulted in an output of 5 units/ output increases at a decreasing rate with an increase in inputs ✓

(1)

(1)

**3.1.4 TWO measures to improve productivity of land**

- Development of disease resistant cultivars/breeds ✓
- The use of fertilisers/manure/compost ✓
- Appropriate use of land/better care of agricultural land ✓
- Adapting to/use of scientific methods/technology/precision/organic farming/correct cultivation methods/crop rotation ✓
- Consolidation of small/uneconomic farming units ✓
- Restoring land potential/resting land/correct land utilisation ✓
- Responsible application of chemicals/pesticides/herbicides ✓
- Mechanisation ✓
- Adapting to appropriate policies/legislation ✓
- Water provision/management/irrigation ✓

(Any 2)

(2)

**3.2 Risk management strategy****3.2.1 Identification of the risk management strategy**

Diversification ✓

(1)

**3.2.2 Reason**

There are different production enterprises on the farm ✓

(1)

**3.2.3 Risk management strategy when production costs is distributed equally**

Risk-sharing ✓

(1)

**3.2.4 The source of risk**

Production risk ✓

Technical risk ✓

(Any 1)

(1)

**3.2.5 TWO management principles the farm manager can employ**

- Planning ✓
- Organizing and coordination ✓
- Implementation ✓
- Control/monitoring ✓

(Any 2)

(2)

**3.3 Contract between a farmer and a farm worker****3.3.1 Definition of a contract**

A legally binding document ✓ between the employer and employee ✓

(2)

**3.3.2 Indication of the type of farm worker**

Permanent/fulltime worker ✓

(1)

**3.3.3 Reason**

The contract will terminate at retirement ✓

(1)

**3.3.4 Labour legislation****(a) Number 7** - Basic Conditions of Employment Act/BCEA  
(Act No. 75 of 1997) ✓

(1)

**(b) Number 8** - Occupational Health and Safety Act/OHSA  
(Act No. 85 of 1993)/ ✓

(1)

**3.3.5 TWO reasons that lead to the movement of farm labourers**

- Poor working conditions/less leave days ✓
- Low wages/salaries ✓
- Longer working hours/ ✓
- Lack of protective clothing ✓

(Any 2)

(2)

**3.4 Capital****3.4.1 Identification of the types of capital****A** - Movable ✓

(1)

**B** - Fixed ✓

(1)

**C** - Working/floating/production ✓

(1)

**3.4.2 TWO methods to create more capital**

- Production/own capital ✓
- Savings ✓
- Credit/loans ✓
- Grants ✓

(Any 2) (2)

**3.4.3 TWO problems associated with capital**

- Scarcity/difficult access to capital ✓
- Expensive/high cost/interest rates ✓
- Depreciation ✓
- Law of diminishing returns ✓
- Undercapitalisation ✓
- Overcapitalisation ✓
- High risk ✓

(Any 2) (2)

**3.5 Balance sheet****3.5.1 Name of the financial statement**

Balance sheet ✓

(1)

**3.5.2 Identification of A from the financial statement**

Current/short term assets ✓

(1)

**3.5.3 Calculation of B**

- $R\ 55\ 000 + R\ 340\ 000 + R\ 570\ 000$  ✓
- $= R\ 965\ 000$  ✓

(2)

**3.5.4 Calculation of the net worth**

- Net worth = Total assets – Total liabilities ✓
- $= R\ 1\ 861\ 000 - R\ 965\ 000$  ✓
- $= R\ 896\ 000$  ✓

(3)  
[35]**QUESTION 4: BASIC AGRICULTURAL GENETICS****4.1 Line breeding flow chart****4.1.1 TWO common ancestors of individuals A and B**

- 1 ✓
- 4 ✓
- 5 ✓

(Any 2) (2)

**4.1.2 The relationship between individuals 2 and 3**

Siblings/brothers and sisters ✓

(1)

**4.1.3 TWO advantages of line breeding**

- Leads to stronger prepotency in the progeny ✓
- Undesirable recessive characteristics can be identified/uncovered for elimination from the herd ✓
- Favourable characteristics of an outstanding ancestor are quickly laid down in the progeny ✓
- Progeny display a high degree of homozygosity ✓ (Any 2) (2)

**4.2 Pedigree diagram****4.2.1 The number of the generations**

3 ✓ (1)

**4.2.2 The number of white males**

4 ✓ (1)

**4.2.3 Genotypes of the individuals****(a) 1 - Dd** ✓ (1)**(b) 5 - dd** ✓ (1)**4.2.4 Indication of homozygous or heterozygous****(a) 6 - Heterozygous** ✓ (1)**(b) 10 - Homozygous** ✓ (1)**4.2.5 The reason to support the answer to QUESTION 4.2.4(b)**

- The offspring is white in colour which is recessive ✓ and can only be expressed in homozygous condition ✓
- White recessive ✓ pure breed ✓ (Any 1) (2)

**4.3 The sex chromosomes****4.3.1 Male cattle - XY** ✓ (1)**4.3.2 Female cattle - XX** ✓ (1)**4.4 Punnet square****4.4.1 Punnet square**

| Gametes | B  | b  |
|---------|----|----|
| b       | Bb | bb |
| b       | Bb | bb |

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- Correct gametes of parent one ✓
- Correct gametes of parent two ✓
- Correct genotypes of the offspring ✓
- Punnet Square (populated with gametes and offspring) ✓ (4)

**4.5 Variation and selection****4.5.1 Type of selection**

Artificial selection ✓

(1)

**4.5.2 ONE animal production characteristic used by farmers**

- Growth ✓
- Health ✓
- Fertility ✓

(Any 1) (1)

**4.5.3 How to improve each of the following****(a) Genetic variation**

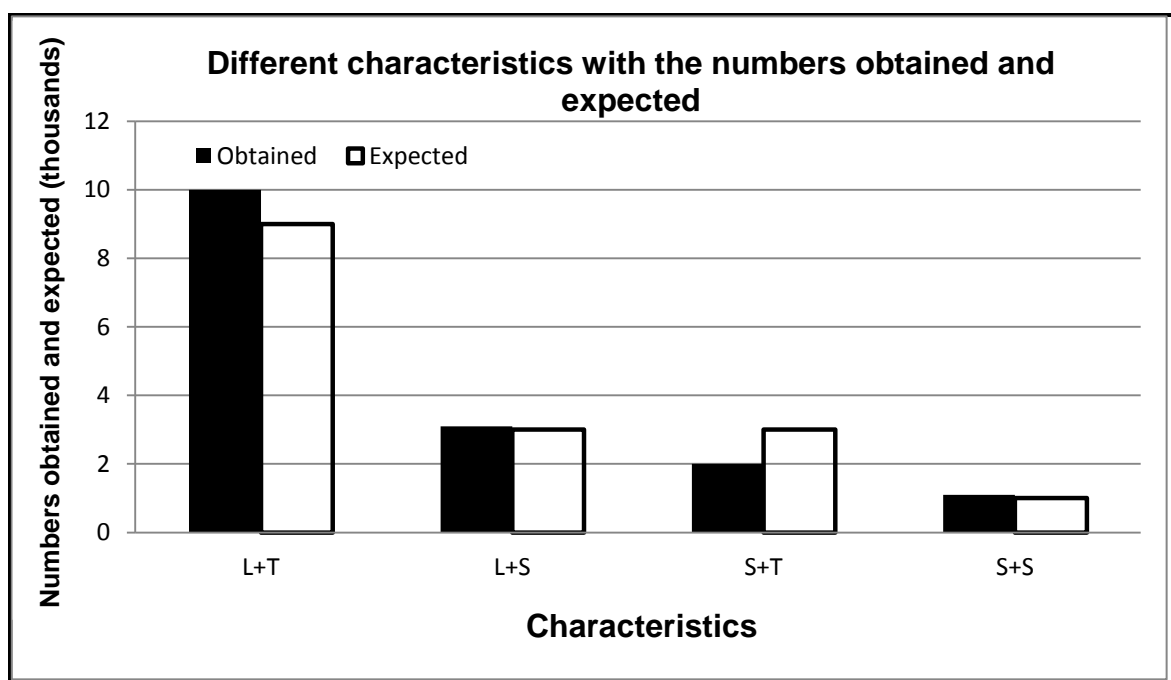
Best bulls for growth/health/fertility were shared ✓

(1)

**(b) Environmental variation**

Utilising the best available pastures/keeping them away from wet/muddy areas ✓

(1)

**4.6 Graph****4.6.1 A combined bar graph of the different characteristics with the numbers obtained and numbers expected****CRITERIA/RUBRIC/MARKING GUIDELINES**

- Correct heading ✓
- X axis - correctly calibrated with label (Characteristics) ✓
- Y axis - correctly calibrated with label (Numbers obtained and expected) ✓
- Correct unit (Thousands) ✓
- Combined bar graph ✓
- Accuracy (80% + correctly plotted) ✓

(6)

- 4.6.2 **Deduction of the trend of the obtained numbers**  
The obtained numbers are declining/decreasing ✓ (1)

4.7 **Genetic Modification**

- 4.7.1 **Identification of the technique**  
Bacterial carriers/Agro-bacterium tumefaciens ✓ (1)

- 4.7.2 **TWO potential benefits of GM crops to the Environment**
- Less chemicals/pesticides/insecticides are used/less susceptible to diseases ✓
  - It is target specific ✓ (2)

- 4.7.3 **TWO potential risks of genetic modified crops**
- Health ✓
  - Environmental ✓
  - Socio-economic ✓ (Any 2) (2)
- [35]**

**TOTAL SECTION B: 105**  
**GRAND TOTAL: 150**