basic education

Department:
Basic Education
REPUBLIC OF SOUTH AFRICA

SENIOR CERTIFICATE EXAMINATIONS/
NATIONAL SENIOR CERTIFICATE EXAMINATIONS

AGRICULTURAL SCIENCES P2

2019

MARKS: 150

TIME: 2½ hours

This question paper consists of 12 pages.

INSTRUCTIONS AND INFORMATION

1.   This question paper consists of TWO sections, namely SECTION A and SECTION B.

2.   Answer ALL the questions in the ANSWER BOOK.

3.   Start EACH question on a NEW page.

4.   Number the answers correctly according to the numbering system used in this question paper.

5.   You may use a non-programmable calculator.

6.   Show ALL calculations, including formulae, where applicable.

7.   Write neatly and legibly.

SECTION A

QUESTION 1

1.1   Various options are provided as possible answers to the following questions. Choose the answer and write only the letter (A–D) next to the question numbers (1.1.1 to 1.1.10) in the ANSWER BOOK, e.g. 1.1.11 A.

   1.1.1   Which ONE of the following is NOT an element of a marketing mix?

   A   Product
   B   Packaging
   C   Placement
   D   Pricing

   1.1.2   A merchant who buys products from producers to sell directly to consumers:

   A   Retailer
   B   Stockbroker
   C   Agent
   D   Processing company

   1.1.3   A marketing approach that responds to increasing environmental concerns is … marketing

   A   mass
   B   green
   C   niche
   D   free

   1.1.4   … is a strategic planning tool that helps an entrepreneur to evaluate the business idea.

   A   Vision
   B   Mission
   C   SWOT analysis
   D   Goals and objectives

   1.1.5   The following aspects are addressed and promoted by labour legislation:

   (i)   Empowerment of the labour force through training and education
   (ii)   Provision of good working conditions
   (iii) Provision of protective clothing to labourers
   (iv)   Full payment for unaccounted leave of absence

   Choose the CORRECT combination:

   A   (i), (ii) and (iii)
   B   (ii), (iii) and (iv)
   C   (i), (ii) and (iv)
   D   (i), (iii) and (iv)

1.1.6   The following is NOT an economic characteristic of land:

A   Destructibility
B   Durability
C   Restrictedness
D   Production potential

1.1.7   The type of credit a farmer will use to purchase land:

A   Short term
B   Medium term
C   Long term
D   Intermediate term

1.1.8   The management skill that a farm manager uses to reflect on changes and to develop new strategies:

A   Problem solving
B   Conceptual
C   Planning
D   Analytic

1.1.9   The statements below refer to heritability:

(i)   High heritability is influenced more by genetic factors.
(ii)   High heritability is influenced more by environmental factors.
(iii)   Low heritability is influenced less by genetic factors.
(iv)   Heritability can be expressed in a percentage.

Choose the CORRECT combination:

A   (i), (ii) and (iii)
B   (ii), (iii) and (iv)
C   (i), (ii) and (iv)
D   (i), (iii) and (iv)

1.1.10   A pure-bred black sow is mated with a pure-bred white boar. The F_1 piglets are all brown. If the F_1 piglets are allowed to inbreed and produce 28 piglets, the number of F_2 brown piglets produced will be …

A   28
B   7
C   21
D   14   (10 x 2)   (20)

1.2   Choose a term/phrase in COLUMN B that matches a description in COLUMN A. Write only the letter (A–H) next to the question numbers (1.2.1 to 1.2.5) in the ANSWER BOOK, e.g. 1.2.6 B.

COLUMN A	COLUMN B
1.2.1 Markets in large centres that sell fruit and vegetables	A biometrics
	B labour
1.2.2 A combination and co-ordination of human and physical resources	C heritability
	D capital
1.2.3 Efficient mechanisation improves the productivity of this production factor	E insurance
1.2.4 An example of fixed capital	F fresh produce market
	G management
1.2.5 Using statistics to analyse biological data	H borehole

(5 x 2)   (10)

1.3   Give ONE word/term for each of the following descriptions. Write only the word/term next to the question numbers (1.3.1 to 1.3.5) in the ANSWER BOOK.

1.3.1   The situation where more goods are produced than demanded

1.3.2   The change in price when the supply or demand of agricultural products changes

1.3.3   The study of how hereditary characteristics are passed from parents to offspring

1.3.4   The ability of animals to transmit their complete sets of characteristics to their offspring

1.3.5   A gene that does not express itself in the presence of the contrasting gene   (5 x 2)   (10)

1.4   Change the UNDERLINED WORD in each of the following statements to make them TRUE. Write only the answer next to the question numbers (1.4.1 to 1.4.5) in the ANSWER BOOK.

1.4.1   Marketing price tends to settle at one point when there is neither shortage nor surplus.

1.4.2   Labour is a production factor that can also be classified as fixed capital.

1.4.3   The outward appearance of an individual is referred to as genotype.

1.4.4   Crossing over is an example of an external cause of variation.

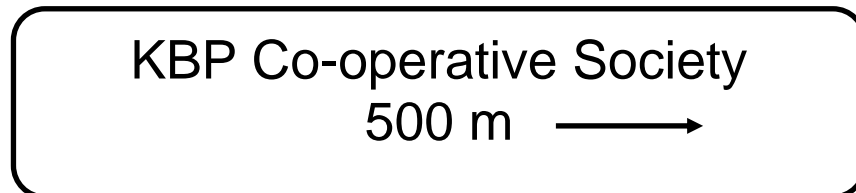1.4.5   Family selection involves selecting individuals based on the records of their offspring.   (5 x 1)   (5)
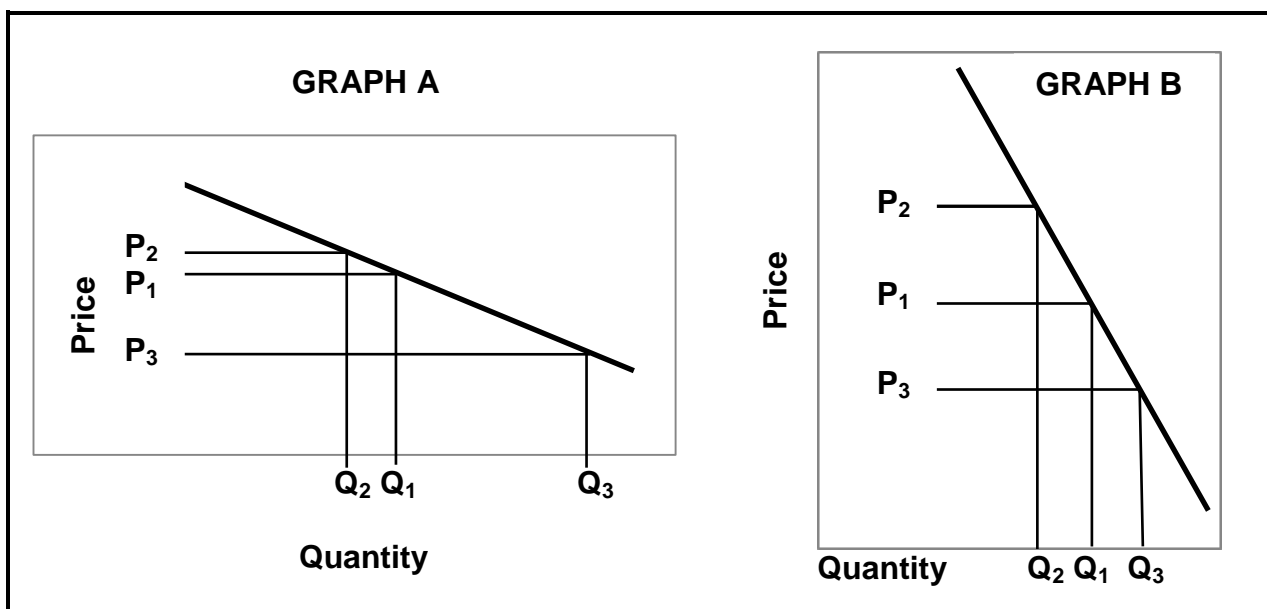
TOTAL SECTION A: 45

SECTION B

QUESTION 2: AGRICULTURAL MANAGEMENT AND MARKETING

Start this question on a NEW page.

2.1   The illustration below shows a type of marketing system used in the agricultural sector.

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┌─────────────────────────────────┐
│   KBP Co-operative Society       │
│        500 m  ──────▶            │
└─────────────────────────────────┘
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2.1.1   Identify the type of marketing system illustrated above.   (1)

2.1.2   Name TWO types of the marketing system identified in QUESTION 2.1.1, based on their roles.   (2)

2.1.3   Differentiate between *marketing* and *selling*.   (2)

2.1.4   State TWO problems that can hamper the marketing chain of agricultural products.   (2)

2.2   The graphs below show the change in the demand for products in relation to the change in price.

2.2.1   Identify the graph (A or B) that represents EACH of the following:

(a)   Price inelasticity of demand   (1)

(b)   Price elasticity of demand   (1)

2.2.2   Give a reason for your answers to QUESTION 2.2.1(a) and (b).   (2)

2.2.3   State THREE other factors that may cause elasticity of demand.   (3)

2.3   The table below represents the quantities of fruit sold at different prices.

PRICE (R)	QUANTITIES OF FRUIT (POCKETS)
20	3 500
25	3 000
30	2 500
35	2 000
40	1 500
45	1 000

2.3.1   Use the data in the table above to draw a line graph comparing the quantities and the prices of the pockets of fruit.   (6)

2.3.2   Deduce the relationship between the price and the quantity of fruit demanded.   (2)

2.4   A business plan is a plan of action that an entrepreneur should have for a business.

2.4.1   Give TWO reasons for drawing up a business plan.   (2)

2.4.2   List THREE items that should be included in the format of a good business plan.   (3)

2.4.3   State TWO problems that may be encountered when drawing up a business plan.   (2)

2.5   An entrepreneur is a person who identifies an opportunity for a business, does research on what will be needed and combines good ideas with the forces of production to produce and make profit.

2.5.1   In the scenario above, identify THREE phases of the entrepreneurial process.   (3)

2.5.2   Name THREE personal characteristics of a successful entrepreneur.   (3)

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QUESTION 3: PRODUCTION FACTORS

Start this question on a NEW page.

3.1   The yield capacity of a piece of land is mainly determined by the physical characteristics of the soil. It can be increased to a certain limit per unit by means of improved technology. A point will be reached where production no longer increases with increased units of input.

   3.1.1   Identify the economic characteristic of land illustrated in this scenario.   (1)

   3.1.2   Describe the implication of the economic characteristic of land identified in QUESTION 3.1.1.   (2)

   3.1.3   State TWO ways in which a farmer can improve the productivity of land.   (2)

   3.1.4   State THREE functions of land as a production factor.   (3)

3.2   Farmers employ different types of labourers for specific tasks to be performed on farms but often lose them to other sectors.

   3.2.1   Name TWO types of labourers that are employed on farms based on the period of employment.   (2)

   3.2.2   Indicate TWO main reasons for the loss of farm labour to other sectors.   (2)

   3.2.3   State TWO ways in which farmers retain their labourers.   (2)

3.3   Indicate the labour legislation that addresses each of the following issues:

   3.3.1   Training workers to improve their efficiency   (1)

   3.3.2   Ensuring that the working environment is safe   (1)

   3.3.3   Labourers can claim compensation if they get injured at work   (1)

3.4　　The table below shows a record with the estimated income and expenditure for an enterprise for a financial year.

EXPENDITURE (R)		INCOME (R)	
ITEM	AMOUNT	ITEM	AMOUNT
Water	10 300	Roses (floral shop)	50 000
Manure	22 345	Roses (nursery)	20 000
Labour	24 500	Compost	7 500
Electricity	13 308		
Potting soil	8 800		
Vegetative material	45 555		
Chemicals	18 756		
TOTAL	--------------	TOTAL	R77 500

3.4.1　Identify the financial record illustrated in the table above.　　(1)

3.4.2　Give a reason for the answer to QUESTION 3.4.1.　　(1)

3.4.3　Use a formula and calculate the possible net income of this enterprise.　　(4)

3.4.4　Identify the problem that this enterprise is likely to experience.　　(1)

3.4.5　State TWO possible ways in which this farmer can make the enterprise viable.　　(2)

3.5　　Farming businesses in some parts of South Africa have been experiencing a drought since 2017, while flash flooding has been occurring in other parts since 2018. As a result of the poor weather conditions, the quality of production is negatively affected and it has resulted in a loss of profits.
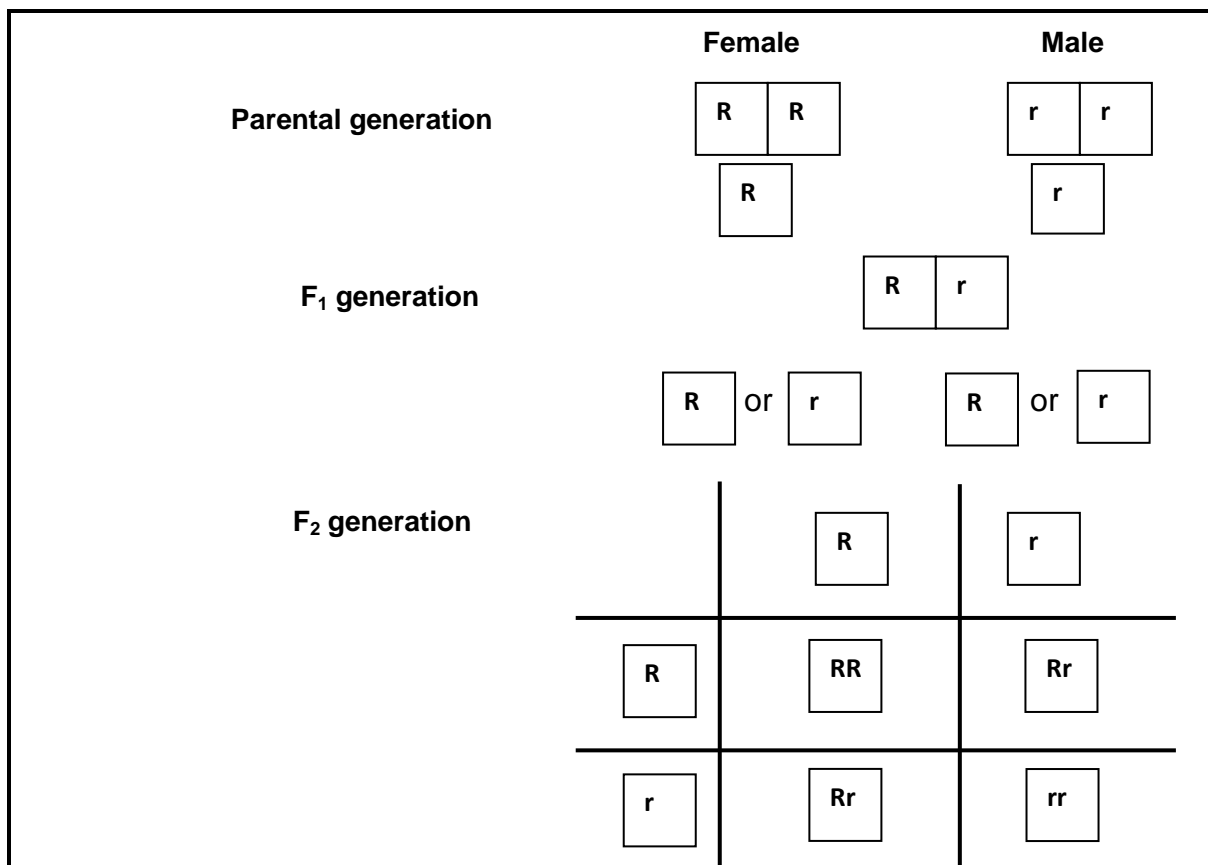
3.5.1　Identify THREE types of risk in the farming industry.　　(3)

3.5.2　Name ONE skill a manager needs to be able to identify the risks in QUESTION 3.5.1.　　(1)

3.5.3　Name TWO strategies that farmers can employ to reduce the risk impact stated in the scenario above.　　(2)

3.5.4　List THREE main principles for the successful management of a farming enterprise.　　(3)

[35]

QUESTION 4: BASIC AGRICULTURAL GENETICS

Start this question on a NEW page.

4.1 The schematic representation below shows how the genotypes are passed down from one generation to the next. (**R** is for red and **r** is for black)

4.1.1 In the schematic representation above, identify the parent with a red phenotype. Give a reason for the answer. (2)

4.1.2 In the schematic representation above, identify the following:

(a) The ratio of the phenotype in the F_2 generation (1)

(b) The ratio of the genotype in the F_2 generation (1)

(c) The phenotype of the F_1 generation (1)

4.2 An investigation was conducted on how certain traits are transmitted in animals. In cattle, black hair colour is dominant (B) over brown hair colour (b). Long hair is dominant (L) over short (l) hair. A bull with short brown hair was crossed with a cow that is homozygous dominant for all traits.

4.2.1 List the traits that are being investigated above. (2)

4.2.2 Indicate the genotype of the bull. (2)

4.3 The effects of genotype and feeding on the growth performance of broilers were investigated. Two different types of broilers were used. Feed restriction resulted in lowered feed conversion rate and less average weight gain.

4.3.1 Identify the following by referring to the scenario above:

(a) Genetic factor of variation (1)

(b) Environmental factor of variation (1)

4.3.2 Refer to the above scenario and explain the relationship between feed restriction and average weight gain. (2)

4.3.3 Formulate a hypothesis of this investigation. (2)

4.4 The crossings below represent different breeding systems applied in cattle farming.

A	B	C
Commercial Brahman cows **X** Drakensberger bull	Sussex bull **X** Sussex cow (bull's daughter)	Pure-bred Afrikaner bull **X** Inferior Afrikaner cows

4.4.1 Identify the breeding systems represented by **A** and **B**. (2)

4.4.2 Write down the letter (A–C) that represents the breeding system which promotes heterosis. (1)

4.4.3 Name TWO disadvantages of inbreeding. (2)

4.4.4 From the crossings above, write down the letter (A–C) that represents the breeding system used to change the enterprise from an ordinary beef herd to a stud beef herd over a long period of time. (1)

4.5 Farmers use selection and different breeding methods as tools to optimize the production output of their enterprises.

4.5.1 Define the concept *selection*. (2)

4.5.2 Name the type of selection used in nature. (1)

4.5.3 Name THREE characteristics farmers select for in animal production enterprises. (3)

4.5.4 Indicate how the farmer can improve each of the following through selection:

(a) The genetic composition of farm animals (1)

(b) Environmental conditions (1)

4.6   The DNA of plants, like maize and wheat, can be changed through genetic modification.

        4.6.1   Name TWO techniques which could be used in this genetic modification process.   (2)

        4.6.2   State TWO disadvantages of genetically modified plants.   (2)

        4.6.3   State TWO advantages of genetically modifying plants.   (2)
                                                                                    [35]

                                                    TOTAL SECTION B: 105
                                                    GRAND TOTAL: 150