NATIONAL SENIOR CERTIFICATE

GRADE 12

SEPTEMBER 2012

AGRICULTURAL SCIENCES P2

MARKS: 150

TIME: 2½ hours

AGRSE2

This question paper consists of 13 pages, including an answer sheet.

INSTRUCTIONS AND INFORMATION

1.   Answer ALL questions from BOTH SECTION A and SECTION B.

2.   SECTION A (QUESTION 1) must be answered on the attached ANSWER SHEET.

3.   Place your ANSWER SHEET for SECTION A (QUESTION 1) within your ANSWER BOOK.

4.   SECTION B (QUESTIONS 2 to 4) must be answered in the ANSWER BOOK.

5.   Start each question from SECTION B on a NEW page.

6.   Read the questions carefully and make sure you answer what is asked.

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

8.   DO NOT SPLIT the answers to the questions.

9.   Write neatly and legibly.
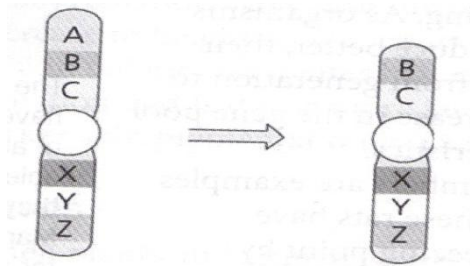
SECTION A

QUESTION 1

1.1   Various options are provided as possible answers to the following questions. Choose the correct answer and make a cross (X) over the appropriate letter in the block (A – D) next to the question number (1.1.1 – 1.1.10) on the attached ANSWER SHEET. NO MARKS WILL BE ALLOCATED IF MORE THAN ONE CROSS (X) APPEARS FOR AN ANSWER.

Example: 1.1.11 | A | B | ~~C~~ | D |

1.1.1   A part of a chromosome breaks off and it is lost during gamete formation as indicated in the diagram below:

This indicates …

A   inversion.
B   duplication.
C   translocation.
D   deletion.

1.1.2   Identify a description in the following statements that does not fall under the Basic Conditions of Employment Act:

A   Granting of maternity leave
B   Paid sick leave
C   Compensation for injured workers during working hours
D   Maximum working hours per week

1.1.3   In … marketing, producers receive a guaranteed price which gives them financial security.

A   co-operative
B   free
C   barter
D   segmentation

1.1.4   Selection of an animal based on the qualities of the relatives of its generation such as full-siblings or half-siblings:

      A   Pedigree selection
      B   Family selection
      C   Mass selection
      D   Progeny selection

1.1.5   The cattle in the picture indicate cross bred cows. The offspring of these breeds would have the following characteristics:

      i.   Very fertile
      ii.   Resistance to diseases
      iii.   Will always have porous bones
      iv.   Adaptable to extreme environmental conditions

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

1.1.6   Movement of money through a business over time is called …

      A   cash flow.
      B   money market.
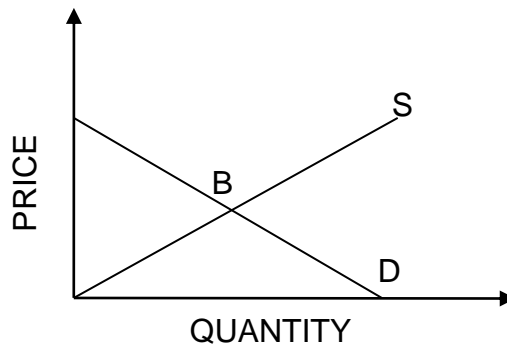   C   cash flow budget.
      D   assets.

1.1.7   Farm dwellers such as labour tenants were given an opportunity to own land and shares in an agricultural enterprise. This is referred to as …

      A   land redistribution.
      B   communal land ownership.
      C   co-operative farming.
      D   a farm equity scheme.

1.1.8 Mendel's second law of inheritance states that when an individual has two different unit factors for the same characteristic, one unit factor is dominant. In modern genetics, unit factors are called …

A   chromosomes.
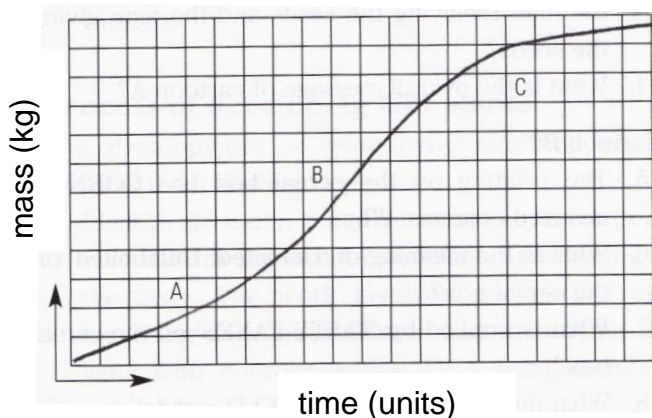B   DNA.
C   genes.
D   recombinant genes.

1.1.9 In a Free market economy, the price of a product is determined by the interaction of Demand (D) and Supply (S).

The letter B indicates …

A   market schedule.
B   equilibrium price.
C   over capitalization.
D   cub-web theory.

1.1.10 The growth curve represents the rate of growth of a genetically modified organism.

How do you interpret the growth at point B?

A   More rapid growth is taking place at B
B   Slow growth is taking place at B
C   Growth rate is steady at B
D   Growth is stagnant at B   (10x2) (20)

1.2   In the table below, a statement and two answers are given. Decide whether the statement in COLUMN B relates to A only, B only, both A and B or none of the answers in COLUMN A. Choose the correct answer and make a cross (X) in the appropriate block next to the question number (1.2.1 – 1.2.5) on the attached ANSWER SHEET.

Example:

	COLUMN A		COLUMN B
1.2.6	A:	radio	visual media
	B:	television	

Answer:

The statement refers to:			
Only A	Only B	A and B	None
A	~~B~~	C	D

1.2.6 is shown with a cross over B.

		COLUMN A	COLUMN B
1.2.1	A:	skilled workers	Mechanics and tractor drivers
	B:	seasonal workers	
1.2.2	A:	mass selection	Scientific way of breeding animals
	B:	pedigree selection	
1.2.3	A:	processing	Farm ⟶ product preparation ⟶ packaging ⟶ transport ⟶ consumer
	B:	marketing chain	
1.2.4	A:	pricing	Marketing mix
	B:	promotion	
1.2.5	A:	loss leading	Estimated returns of an enterprise
	B:	price lining	

                                                      (5x2)   (10)

1.3   Give ONE TERM/DESCRIPTION for each of the following descriptions. Write only the term next to the question number (1.3.1 – 1.3.5) on the attached ANSWER SHEET.

    1.3.1   A documented plan of the expected income, expenditure and profit of a business is called the …

    1.3.2   The law that explains the addition of successive units of one production factor that does not result in proportional increase in yield

    1.3.3   Breeding system in which individuals from the same breed but from a different flock are allowed to breed in the rural communities

    1.3.4   A tool to reduce or eliminate financial risk by reducing the impact of future changes in market prices

    1.3.5   An economic term used when the value of an item decreases over time   (5x2)   (10)

1.4   Change the UNDERLINED WORDS in the following statements to make them TRUE. Write only the appropriate word(s) next to the question number (1.4.1 – 1.4.5) on the attached ANSWER SHEET.

    1.4.1   In the <u>pool marketing</u> system, farmers sell their farm produce where and when they want and at prices of their choice.

    1.4.2   The heritability percentage of the fleece weight of a sheep is 23%. This characteristic is determined more by <u>genetic</u> factors.

    1.4.3   <u>The Upgrading of Land Tenure Rights Act (1996)</u> allows communities to take ownership of the communal land on which they have been living.

    1.4.4   <u>Recessive genes</u> are alleles that cause an individual to die or be badly deformed.

    1.4.5   A summary of assets and liabilities of an enterprise is called <u>budget</u>.

                                                                                      (5x1)   (5)

TOTAL SECTION A: 45

SECTION B

START THIS QUESTION ON A NEW PAGE

QUESTION 2   AGRICULTURAL MANAGEMENT

2.1 | One of the ways of effective management of a farm enterprise is to keep daily records of all farming activities. Farmers who keep records can easily evaluate their performance for the past season and do proper planning for the future. The records kept on the farm should include labour records, crops records and livestock records. |

    2.1.1   Provide TWO reasons from the scenario above to justify the use of records on a poultry farm.   (2)

    2.1.2   Predict the possible details that labour records should cover.   (2)

    2.1.3   Assuming that you have invoices of the following items:

| poultry feed | number of workers | fertilizers |

        Under which farm records in the scenario would you file each of these items?

        (a)   poultry feed   (1)

        (b)   number of workers   (1)

        (c)   fertilizers   (1)

2.2 The management team of a farm met to take decisions regarding the poor yield during the cropping season.

The manager listed the following as steps in the decision-making process that the meeting should look at:

o Choose the best solution
o Describe the problem
o Evaluate all possible solutions
o Identify all the possible solutions

2.2.1 Re-arrange the steps involved in the decision making process in QUESTION 2.2 appropriately. (4)

2.2.2 What positive conclusion can be drawn about the working relations in the scenario in QUESTION 2.2? (2)

2.2.3 The farmers decided to join a co-operative union to market their products in future. Identify THREE advantages the farmers will enjoy. (3)

2.2.4 Predict THREE methods the farmers should consider in setting prices in any market they would enter. (3)

2.3 A demand schedule for cashew nuts at a farm gate is recorded as follows:

Price	Quantity demanded
R1	900
R2	700
R3	500
R4	300
R5	100

2.3.1 Design a demand curve from the schedule in QUESTION 2.3. (4)

2.3.2 Deduce the law of demand from the demand curve you designed in QUESTION 2.3.1. (2)

2.3.3 Suggest THREE factors that can influence the supply of cashew nuts by the traditional farmers. (3)

2.3.4 Differentiate between stock sales and farm gate marketing and give ONE advantage of each of the marketing channels. (4)

2.4 Define the concept "business plan". (3)

[35]

START THIS QUESTION ON A NEW PAGE

QUESTION 3   PRODUCTION FACTORS AND MANAGEMENT

3.1   There is a range of legislation that controls and directs the use and management of natural resources in South Africa.

      3.1.1   List any TWO of the natural resource legislation.   (2)

      3.1.2   What are the THREE components of the land reform programme in South Africa?   (3)

      3.1.3   Justify the importance of the land reform programme with TWO reasons, considering the historical land policies in South Africa.   (2)

3.2   South Africa is a medium-sized country with a total land area of 1,2 million km². Because of the topography and other factors, only 14 million ha of the total land is arable.

      3.2.1   Suggest FOUR characteristics of land as a production factor.   (4)

      3.2.2   State TWO ways how farmers can improve the productivity of land.   (2)

3.3   Three types of farm workers are indicated in the photos as A, B, and C.

      Examine the photos carefully and answer the questions that follow:

A	B	C

      3.3.1   Deduce the types of farm workers in pictures B and C.   (2)

      3.3.2   Identify THREE management practices that could motivate the workers to maximize production.   (3)

      3.3.3   State the labour legislation which would be applied to any of the workers who become disabled or injured in the work place.   (1)

3.4 | An Agricultural Extension Officer organised a workshop for local farmers in a location. The officer stressed that all farmers need to keep financial records and records of <u>assets</u> in order to manage the capital of their farm businesses effectively. The officer trained the farmers to prepare samples of a budget on their farm for the 2012-farm season. The farmers had buildings, breeding livestock and feeds on their farms.

3.4.1 Define the underlined word in the scenario in QUESTION 3.4. (2)

3.4.2 Categorise the assets mentioned in the scenario. (3)

3.4.3 Differentiate between an enterprise budget and a whole farm budget. (2)

3.4.4 A farmer invested R54 600 in a commercial farm. At the end of the farming season, the total income was R64 500. Calculate the profit or loss of the farmer. Show all calculations. (2)

3.5 The changing of a product into a more usable form is sometimes required before the consumer will buy it.

3.5.1 Mention THREE advantages of processing tomatoes in South Africa. (3)

3.5.2 Suggest TWO ways to calculate interest on bank loans. (2)

3.5.3 List TWO traditional methods of food processing. (2)

[35]

START THIS QUESTION ON A NEW PAGE

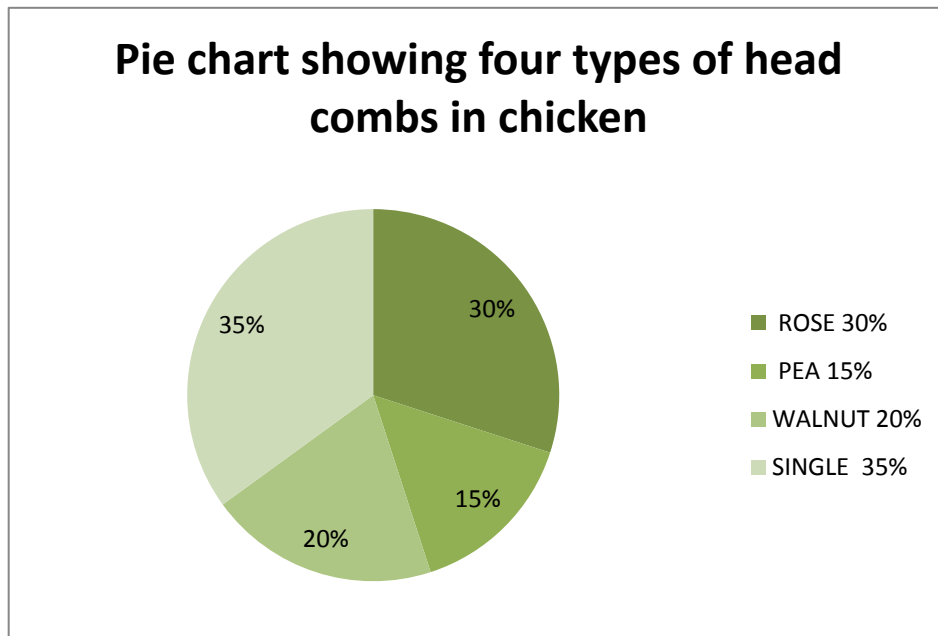**QUESTION 4   BASIC AGRICULTURAL GENETICS**

4.1   Long before Gregor Mendel was born, our ancestors were doing breeding and
      selection of crops and animals in South Africa with success. In some
      instances, breeding of different species of animals took place.

  4.1.1   Define inbreeding in plant systems and give ONE advantage of it.   (3)

  4.1.2   Identify FOUR environmental factors that could cause variations in
          the animals kept by our ancestors.   (4)

  4.1.3   Suggest THREE principles of selection that must be considered by
          local farmers during selection of cattle for breeding purposes.   (3)

4.2   The pie chart of four types of chicken head combs is shown below:-

Pie chart showing four types of head combs in chicken

ROSE 30%
PEA 15%
WALNUT 20%
SINGLE 35%

  4.2.1   Draw a bar graph to represent the pie chart in QUESTION 4.2.   (4)

  4.2.2   State the type of variation that shows a few clear-cut forms.   (1)

4.3   The illustration below indicates the mating of a pure-bred brown goat with the same pure-bred white goat. Brown (Q) is dominant over white (q).

     4.3.1   Draw a punnet square to show the crosses in the F_1 generation.   (4)

     4.3.2   State Mandel's law, which explains the brown colour of the offspring in the F_1 generation.   (2)

     4.3.3   Assuming that you are to compare the crosses for colour and size of the goats, what could be the genotype ratio in the F_2 generation?   (1)

4.4   Give brief descriptions of the following terminologies:

     4.4.1   Co-dominance   (2)

     4.4.2   Inbreeding depression   (2)

4.5   State THREE techniques used to genetically modify plants.   (3)

4.6   Imagine that you are a genetic engineer; draw a flow chart to show how you would apply agrobacterium tumefaciens to modify a plant.   (4)

4.7   Mention TWO hormones involved in the regulation of growth in animals.   (2)

                                                                 [35]

                              TOTAL SECTION B: 105

                                  GRAND TOTAL: 150

ANSWER SHEET   AGRICULTURAL SCIENCES P2

NAME AND SURNAME

SECTION A

QUESTION 1.1

1.1.1	A	B	C	D
1.1.2	A	B	C	D
1.1.3	A	B	C	D
1.1.4	A	B	C	D
1.1.5	A	B	C	D
1.1.6	A	B	C	D
1.1.7	A	B	C	D
1.1.8	A	B	C	D
1.1.9	A	B	C	D
1.1.10	A	B	C	D

(10x2) (20)

QUESTION 1.2

	ONLY A	ONLY B	BOTH A and B	None
1.2.1	A	B	C	D
1.2.2	A	B	C	D
1.2.3	A	B	C	D
1.2.4	A	B	C	D
1.2.5	A	B	C	D

(5x2) (10)

QUESTION 1.3

1.3.1 _____

1.3.2 _____

1.3.3 _____

1.3.4 _____

1.3.5 _____

(5x2) (10)

QUESTION 1.4

1.4.1 _____

1.4.2 _____

1.4.3 _____

1.4.4 _____

1.4.5 _____

(5x1) (5)

45