



Province of the
EASTERN CAPE
EDUCATION

**NATIONAL
SENIOR CERTIFICATE**

GRADE 12

SEPTEMBER 2014

AGRICULTURAL SCIENCES P2

MARKS: 150

TIME: 2½ hours



This question paper consists of 14 pages.

INSTRUCTIONS AND INFORMATION

1. Answer ALL questions in the ANSWER BOOK.
2. Start EACH question on a NEW page.
3. Read ALL questions carefully and answer only what is asked.
4. Number the answers correctly according to the numbering system used in this question paper.
5. Non-programmable calculators may be used.
6. Show ALL your 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 number (1.1.1–1.1.10) in the ANSWER BOOK, for example 1.1.11 D.

1.1.1 One of the following is not a risk management strategy on a livestock enterprise:

- A Specialisation
- B Diversification
- C Insuring against risk
- D Mass slaughtering of livestock (2)

1.1.2 An example of inbreeding in plant studies is ...

- A line breeding.
- B backcrossing.
- C self-pollination.
- D cross pollination. (2)

1.1.3 ... is the process of dividing up the market into smaller groups of buyers with similar characteristics and needs.

- A Marketing mix
- B Market segmentation
- C Mass marketing
- D Marketing chain (2)

1.1.4 An instrument or apparatus that fires desired genes into a piece of plant tissue in the process of genetic modification is a ...

- A gene gun.
- B ball gun.
- C pistolette.
- D syringe gun. (2)

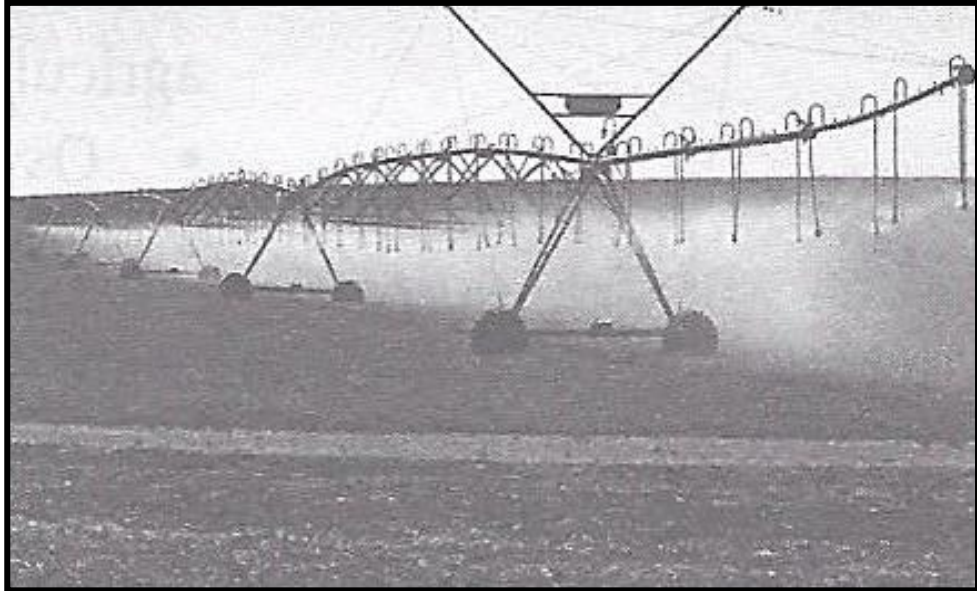
1.1.5 Agri-production factors do not include the following:

- A Management principles
- B Labour
- C Capital
- D Land (2)

1.1.6 This act controls the export of perishable products from South Africa:

- A Perishable Consumer Protection Act (Act No. 68 of 2008)
- B Perishable Products Export Control Act (Act No. 9 of 1983)
- C Perishable Meat Safety Act (Act No. 40 of 2000)
- D Agricultural Produce Agents Act (Act No. 12 of 1992) (2)

1.1.7 The figure below is an example of ...



- A fixed capital.
- B movable capital.
- C working capital.
- D None of the above (2)

1.1.8 The labour legislation that makes the farmer responsible for ensuring that the working environment is safe is the ...

- A Skills Development Act of 1998.
- B Labour Relations Act of 1995.
- C Occupational Health and Safety Act of 1993.
- D Basic Conditions of Employment of 1997. (2)

1.1.9 The phenotype ratio in the crossing below:

	AB	Ab	aB	ab
AB	AABB	AABb	AaBB	AaBb
Ab	AABb	AAbb	AaBb	Aabb
aB	AaBB	AaBb	aaBB	aaBb
ab	AaBb	Aabb	aaBb	aabb

A - flower color (purple)
a - flower color (white)
B - plant size (tall)
b - plant size (short)

- A 9:4:3:1
B 9:4:4:2
C 9:3:3:1
D 9:3:3:3

(2)

1.1.10 A mechanism of inheritance in which the expression of one gene is controlled by another gene is ...

- A epistasis.
B co-dominance.
C atavism.
D sex linkage.

(2)

(10 x 2) (20)

- 1.2 In the table below, a statement is given. Match the statement in COLUMN B with the term in COLUMN A. Choose the answer and write only the letter next to the question number in the ANSWER BOOK, for example 1.2.6 G.

COLUMN A		COLUMN B	
1.2.1	over capitalisation	A	the way the price changes demand or supply
1.2.2	paying bonuses	B	hybridisation
1.2.3	elasticity	C	mutation
1.2.4	executive summary	D	investing more than it is necessary in a business
1.2.5	crossing over	E	encourages labour productivity
		F	business plan

(5 x 2) (10)

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

- 1.3.1 The process of sorting agricultural products according to set standards
- 1.3.2 The effective combination and coordination of all resources to achieve a specific goal, usually maximising profit
- 1.3.3 A person, who identifies an opportunity, gathers resources and sets up a business, taking on the risk involved in the hope of making profit
- 1.3.4 A sudden re-appearance of a characteristic of an ancestor that has not been present for a long time
- 1.3.5 The assets and cash on hand which are the property of a business and can be used as the basis for production purposes of profit

(5 x 2) (10)

1.4 Change the UNDERLINED WORD/S 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) in the ANSWER BOOK.

- 1.4.1 Storage is an operation that changes a raw material to a form that satisfies consumers' needs.
- 1.4.2 Any process that produces an identical copy of biological material, from individual genes or cells, to a whole animal is referred to as synchronisation.
- 1.4.3 One production factor that can be restricted or underutilised because of urbanisation is capital.
- 1.4.4 One genetic effect of inbreeding is that more of the gene pairs in the population become heterozygous.
- 1.4.5 Multiple alleles is a mechanism of inheritance whereby one pair of alleles is responsible for the production of two distinct characteristics.

(5 x 1) (5)

TOTAL SECTION A: 45

SECTION B**QUESTION 2: AGRICULTURAL MANAGEMENT AND MARKETING**

Start this question on a NEW page.

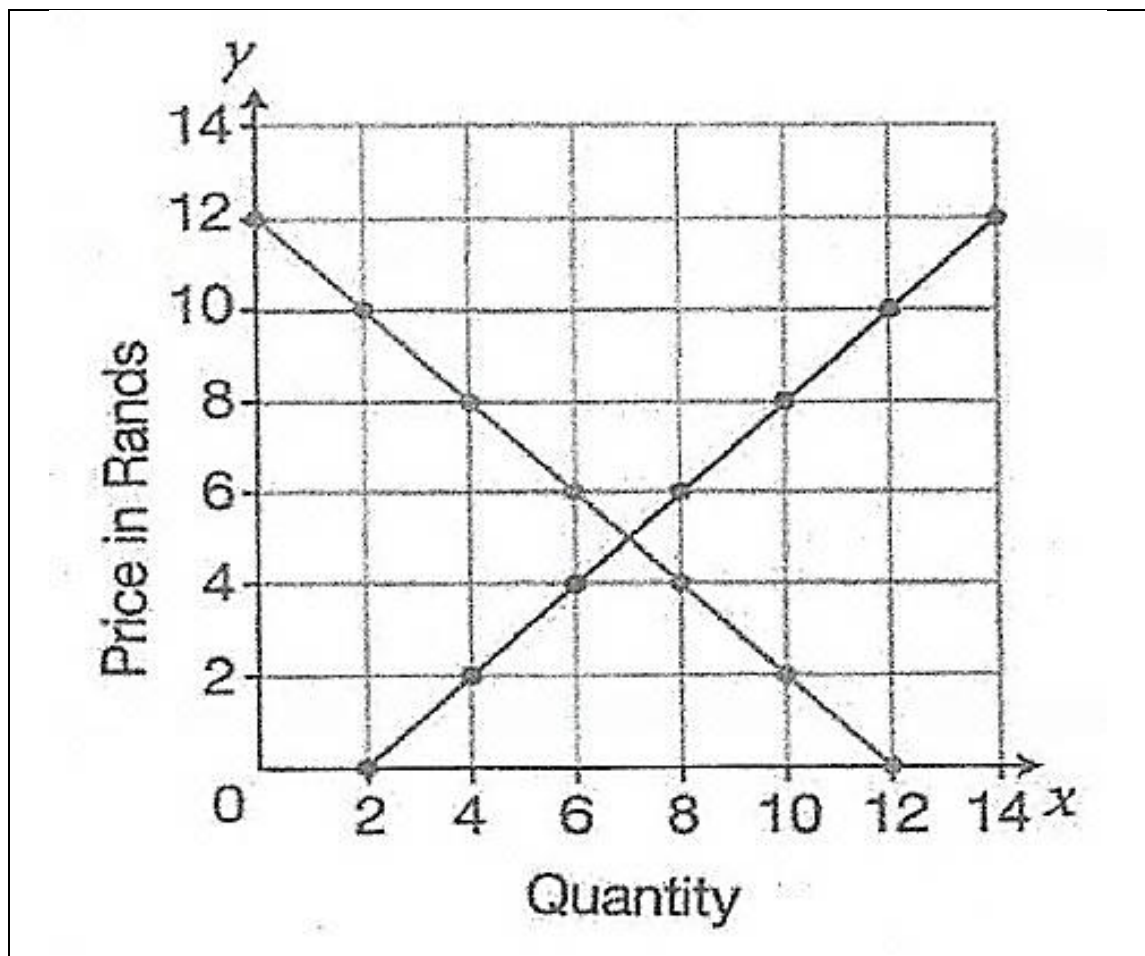
- 2.1 The illustration below indicates a marketing system where the members have formed a marketing association jointly owned, controlled, organised and operated on principles.



FIGURE 2.1

- 2.1.1 Identify the appropriate marketing system illustrated in FIGURE 2.1 above. (1)
- 2.1.2 Suggest THREE principles for the formation of the marketing system in QUESTION 2.1.1 above. (3)
- 2.1.3 Suggest THREE reasons why you would recommend the marketing system in QUESTION 2.1.1 to emerging farmers. (3)
- 2.2 The sequence or steps involved in transferring any farm produce from the farm to the final consumer involves costs.
- 2.2.1 Indicate THREE costs associated with transportation within the stages of the marketing chain. (3)
- 2.2.2 State THREE measures that could streamline and improve the agricultural business chain. (3)
- 2.3 Two important elements of marketing any product are: setting a good price and promoting the product. Promoting a product means telling people about it and convincing them to buy it.
- 2.3.1 Mention TWO methods and give an example of each method people use to promote products. (4)
- 2.3.2 Predict THREE factors an emerging farmer should consider in setting the price of products. (3)

- 2.4 The data below indicates the demand and supply of mangoes on a farm. Use the information to answer the questions that follow.



- 2.4.1 Interpret the law of supply as indicated with mangoes from QUESTION 2.4 above. (2)
- 2.4.2 Suggest the price at which demand is equal to supply. (1)
- 2.4.3 Indicate the quantity of mangoes that:
- A would be demanded at R10
 - B would be supplied at R10
- (2)
- 2.4.4 State THREE factors that affect the demand of mangoes. (3)

- 2.5 Five marketing channels related to a free market system are indicated in the table below.

Match the marketing channels to the processes involved from QUESTION 2.5.1 to 2.5.5.

Internet marketing
Fresh produce markets
Stock sales
Contract market
Farm gate marketing

- 2.5.1 Goats, sheep and cattle are sold on auction to the highest bidder. (1)
- 2.5.2 Goods are advertised and sold electronically mostly by using computers. (1)
- 2.5.3 An agreement or arrangement by the farmer to sell direct to wholesaler. (1)
- 2.5.4 A farmer sells cabbage direct from the farm. (1)
- 2.5.5 Mangoes and apples are graded, weighed and the whole lot is purchased and delivered immediately to markets. (1)
- 2.6 Suggest TWO reasons for drawing up a business plan in agricultural sector. (2)
- [35]**

QUESTION 3: PRODUCTION FACTORS AND MANAGEMENT

Start this question on a NEW page.

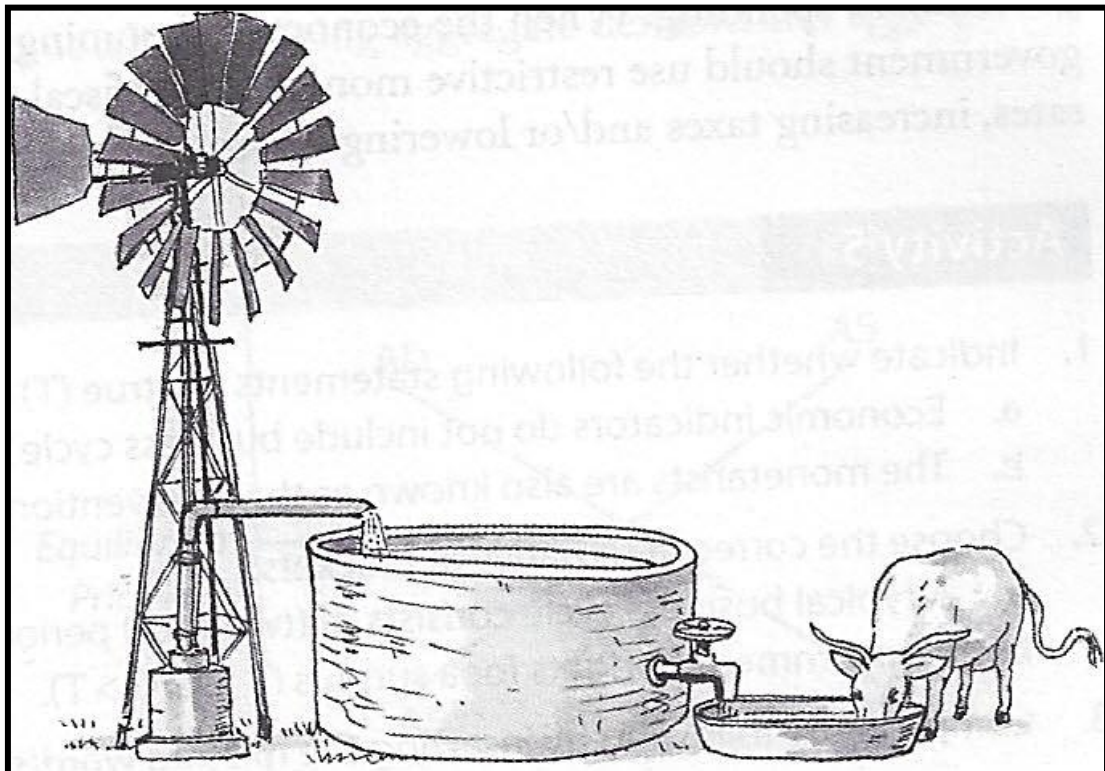
- 3.1 One of the economic characteristics of land is that, land is subject to the law of diminishing returns.

3.1.1 Briefly explain the implication of the underlined statement in production. (2)

3.1.2 List TWO other economic characteristics of land apart from the underlined statement in QUESTION 3.1. (2)

3.1.3 Describe THREE techniques/methods to increase the productivity of land. (3)

- 3.2 The illustration below indicates some materials on a farm that have monetary value.



3.2.1 Identify the TWO types of capital depicted in QUESTION 3.2 with examples. (4)

3.2.2 Justify your answer in QUESTION 3.2.1. (2)

- 3.3 An emerging farmer drew an estimated *income and expenditure plan* of his/her farm enterprise. The estimated plan included the following information:

Sale of sheep	R27 500,00
Wages of farm workers	R13 400,00
Payment of <u>overdraft</u>	R 3 700,00
Interest from savings	R 1 800,00

- 3.3.1 Draw an *income and expenditure plan* using the information in QUESTION 3.3 above. (4)
- 3.3.2 Calculate the farmer's expected profit or loss in QUESTION 3.3 above. (3)
- 3.3.3 Define the underlined description in QUESTION 3.3 above. (2)
- 3.4 A young livestock farmer kept several stocks on a field, without taking proper care of them. Most of the livestock contracted diseases and died. Other animals that survived were either stolen, or they got lost. The farmer heard that the demand for vegetables was lucrative and decided to go into intensive vegetable production. The farmer approached you as an agricultural sciences learner for advice on how to develop strategies that could help him/her to be successful.
- 3.4.1 Suggest THREE strategic management components the farmer should adopt for the new vegetable production. (3)
- 3.4.2 State TWO risk management practices to prevent any future loss. (2)
- 3.4.3 Indicate THREE external forces that affect the management of a business. (3)
- 3.5 In the workers' contract of employment, termination of employment is one of the conditions. Some workers are dismissed by farmers without any valid reason. Farm workers consult their unions and the CCMA to apply the appropriate labour laws and to find solutions to illegal dismissals.
- 3.5.1 Briefly explain the underlined condition in the worker's contract. (2)
- 3.5.2 Mention TWO labour legislations applicable when a worker's employment is terminated. (2)
- 3.6 Indicate ONE role played by the unions and CCMA. (1)

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QUESTION 4: GENETICS

Start this question on a NEW page.

- 4.1 The picture below is an Ancon sheep which has a mutation that makes its legs to be very short. It looks very different among the flock of Ancon sheep.



- 4.1.1 Define the term '*mutation*'. (2)
- 4.1.2 Mention THREE causes of mutation in the animal. (3)
- 4.1.3 Suggest TWO advantages of variation to farmers. (2)
- 4.2 The two biggest uses of genetic modification have been to create crops that resist the herbicide glyphosate (used to control weeds) and crops that generate their own internal insecticide (Bt, widely used by both organic and conventional growers). Both of those traits are popular with farmers, and the vast majority of corn, soya and cotton grown in the United States has one or both of them.
- [Source: www.washingtonpost.com]
- 4.2.1 Indicate the TWO traits from the scenario that are popular with farmers in the United States. (2)
- 4.2.2 Mention THREE potential environmental hazards of genetic modification in South Africa. (3)
- 4.2.3 Suggest TWO reasons why animals are genetically modified. (2)

- 4.3 A dairy farmer measured the milk yield of different dairy breeds of cows and made the following recording on 32 jersey breeds.

Milk yield in litres	Number of cows
100 – 2 999	2
3 000 – 3 999	5
4 000 – 4 999	8
5 000 – 5 999	10
6 000 – 6 999	6
7 000 – 7 599	3
7 600 – 8 000	2

- 4.3.1 Translate the information in the table on milk yield into a line graph. (5)
- 4.3.2 Identify the number of cows that produced the maximum in the table. (1)
- 4.3.3 Suggest TWO reasons why the cows in QUESTION 4.3.2 could be recommended for breeding purposes. (2)
- 4.4 Two farm animals were mated. A bull with a gene for brown (**B**) is dominant over a cow with a recessive gene (**b**) for white.
- 4.4.1 Draw a Punnet square to show the crossings. (4)
- 4.4.2 Indicate the phenotype ratio in percentages. (2)
- 4.5 A horse farmer wants to calculate the Estimated Breeding Value for weight of a breed he/she bought at an agricultural show. The farmer's farm records gave the following information:
- Weaning weight of the horse = 350 kg
 Average weaning weight of all the horses on the farm = 310 kg
 Heritability %: 60
- Calculate a simple estimated breeding value (EBV) for the horse by using the following formula:
- $$EBV = (WW - AWW) \times \text{heritability \%}$$
- Where EBV = Estimated breeding value
 WW = weaning weight of the horse
 AWW = average weaning weight of all the horses (4)
- 4.6 Suggest ONE major disadvantage of species crossing. (1)
- 4.7 List TWO advantages of upgrading in animals. (2)

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TOTAL SECTION B: 105
GRAND TOTAL: 150

