

education

Department: Education **REPUBLIC OF SOUTH AFRICA**

NATIONAL SENIOR CERTIFICATE

GRADE 12



MARKS: 150

TIME: 2 hours

This question paper consists of 20 pages and 1 answer sheet.

Please turn over

INSTRUCTIONS AND INFORMATION

- 1. Answer ALL the questions from BOTH SECTIONS A and B.
- 2. SECTION A (QUESTION 1) must be answered on the attached ANSWER SHEET.
- 3. Place the ANSWER SHEET for SECTION A (QUESTION 1) in the ANSWER BOOK.
- 4. SECTION B (QUESTIONS 2, 3 and 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 answer and make a cross (X) in the block (A - D) next to the question number (1.1.1 - 1.1.10) on the attached ANSWER SHEET.
 - 1.1.1 An important source of carbohydrates for cattle is ...
 - А lucerne.
 - В legumes.
 - С maize meal.
 - D carcass meal.
 - 1.1.2 The element that is necessary for the production of hemoglobin and red blood corpuscles is ...
 - А iodine.
 - В iron.
 - С zinc.
 - D calcium.
 - 1.1.3 A management technique where a farmer may practise a number of different enterprises in order to reduce the risk factor, is known as ...
 - А diversification.
 - В cash flow budget.
 - С consolidation.
 - potential management skills. D
 - 1.1.4 Atoms with the same atomic number but different mass numbers are called ...
 - А isomers.
 - В elements.
 - С neutrons.
 - D isotopes.
 - 1.1.5 Which ONE of the following methods improves uniformity of families?
 - А Cross-breeding
 - В Inbreeding
 - С Upgrading
 - Species crossing D

- 1.1.6 Minerals are inorganic substances that play a very important role in chemical reactions in the body of farm animals, for example acute shortage of calcium in the body might result in an animal suffering from ...
 - A milk fever.
 - B tetanus.
 - C brucellosis.
 - D splenic fever.
- 1.1.7 The graph below represents the hormone levels of a cow during her period of oestrus. Indicate the position when ovulation would most likely take place by using the labels marked A D.



- A At position A on the graph.
- B At position B on the graph.
- C At position C on the graph.
- D At position D on the graph.

1.1.8 The diagram below represents the reproductive system of a cow. Indicate the part (organ) labelled A – H that protects the uterus from infections during pregnancy.



- A Part labelled H
- B Part labelled G
- C Part labelled F
- D Part labelled C
- 1.1.9 In farming, capital that enables the producer to buy goods required in the production process such as boreholes, pumps and canals are referred to as examples of ...
 - A fixed capital.
 - B movable capital.
 - C cash.
 - D working capital.
- 1.1.10 The quantity of maize demanded by the poultry farmers was exactly equal to the quantity of maize that could be supplied by maize farmers. How would you describe this situation?
 - A Standardisation of products
 - B Hypothetical demand
 - C Market equilibrium
 - D Shortage of maize

(10 x 2) (20)

1.2 Choose a word/term from COLUMN B that matches the illustration/diagram in COLUMN A. Write only the letter (A - J) next to the question number (1.2.1 - 1.2.5) on the attached ANSWER SHEET.

| | COLUMN A | COLUMN B |
|-------|---|---|
| 1.2.1 | | A HIV/Aids awareness |
| 1.2.2 | | B heart-water disease |
| | graup (NH ₂) H H OH GOOH | C structure of amino acid |
| 1.2.3 | | D artificial vagina |
| 1.2.4 | | E mineral lick to supplement calcium and phosphorus to farm animals |
| 1.2.5 | A.S. | F animal production |
| L | | G blood donation |
| | | H pistolette |
| | | I propanoic acid |
| | | J handling behaviour |
| | | (5 x 2 |

(10)

- 1.3 Give ONE term 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 The chemical reaction which takes place when equal quantities of acid and alkaline solutions are mixed
 - 1.3.2 The carbohydrate stored in the liver and muscles of animals
 - 1.3.3 The knowledge that a small farmer in the rural area uses when an extract of a root of *Tylsema fassoglense* is applied as a drench when the placenta is not expelled after the birth
 - 1.3.4 An economic term that decribes the total monetary value of goods produced and services provided in a country in one year
 - 1.3.5Agricultural legislation which promotes the return of land or provision
of compensation to those who had land taken away from them in the
past(5 x 2)
- 1.4 Change the underlined words in the following to make the statements 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 The breeding of closely related animals is called <u>upgrading</u>.
 - 1.4.2 A handy tool used to determine the nutritive value of feed or to calculate the quantities of feed components is the <u>punnett square</u>.
 - 1.4.3 <u>Credit</u> is the amount of additional money paid over and above the amount borrowed.
 - 1.4.4 The ability that certain animals have to carry over their specific characteristics to their progeny/offspring is known as <u>atavism</u>.
 - 1.4.5 The process by which salt crystals are broken down into ions in a solution is called <u>neutralisation</u>. (5×1) (5)

TOTAL SECTION A: 45

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SECTION B

Start this question on a NEW page in the answer book provided.

QUESTION 2

2.1 The diagrams below show the alimentary canals of three farm animals.



2.1.1 Identify the THREE types of alimentary canals using the information provided in the list below.

EXAMPLE: Animal FIGURE 1 = ...

- 2.1.2 Name the parts labelled A, M and L.
- 2.1.3 In FIGURE 3 grinding of food by physical means takes place in this organ. Identify the organ and write down the letter that denotes the organ.
- 2.2 Maize (A) and soya beans (B) were provided to a young farmer to prepare a balanced ration for his/her dairy cows. The cows need 25% protein in their ration for milk production. Maize has a protein content of 9% and soya beans 40%. Calculate the answers to the following questions using a square method:
 - 2.2.1 Calculate the ratio of feed A and feed B needed in the mix to get to the required protein value in the ration. (2)
 - 2.2.2 Calculate the percentage of maize that is required in this mixture. (3)
 - 2.2.3 Give ONE reason why a balanced ration is required for these cows. (1)

(3)

(1)

2.3 Below is a schematic representation that illustrates some environmental factors that affect the production of farm animals.



Name any FOUR factors from the schematic representation that can be controlled by the farmer to improve animal production.

2.4

SCENARIO

The indigenous knowledge system in South Africa has played an important role in Agricultural Sciences. Animal keeping was not only for meat and milk production in the past. Our ancestors used dry cow dung to make fire, fresh dung for cleaning floors of huts and to produce kraal manure which was used as a fertiliser. Oxen were used for ploughing. Clothes were produced from hides and skins of animals. This indigenous knowledge or indigenous methods of farming are still relevant to farming today.

- 2.4.1 Identify TWO products from the scenario above that were produced from animals other than milk and meat.
- 2.4.2 Suggest TWO uses for keeping animals in the past which are not mentioned in the scenario.

(4)

(2)

(2)

- 2.5 The government allocated 5 hectares of farmland to you to rear farm animals. You need enough money to start farming. Apart from that, you are puzzled with how to go about the farming enterprise. The following management principles have been given to you as guidance to start farming:
 - Control
 - Organisation of resources
 - Implementation
 - Planning
 - Evaluation of work
 - 2.5.1 Re-arrange the management principles and place them in logical or correct order/stages so that you can succeed. Give your answer as a schematic representation as indicated below:



- 2.5.2 Suggest TWO other ways by which farmers can increase their capital apart from using their savings at the bank. (2)
- 2.6 Indicate THREE environmental factors that promote variation in livestock. (3)

(5)

2.7 The following Lewis structure represents a typical monosaccharide.



- 2.7.1 Will this molecule be a good source of energy? Give a reason for your answer.
- 2.7.2 Assume that only hydrogen atoms bond to these carbon atoms. Each carbon should have four bonds.

Determine the number of hydrogen atoms that are needed in the ring structure in order to complete the bonding on the carbon atoms.

(2) **[35]**

(2)

QUESTION 3

Start this question on a NEW page.

3.1 The processes of normal parturition that can be observed by a farmer are listed in the table below and are marked A - F. Re-arrange the processes in the correct order as they occur in a normal parturition, by giving the correct sequence of the letters A - F.

| A | The placenta is expelled. |
|---|--|
| В | Rhythmic contractions of the muscles of the uterus/womb. |
| С | The membranes break and the amniotic fluid flows from the vulva. |
| D | The foetus moves to the normal birth position. |
| E | The head and front legs of the foetus emerge from the vulva. |
| F | Expulsion of the foetus. |

(6)

3.2 The diagrams below indicate the reproductive structures of farm animals. Answer questions (3.2.1 - 3.2.5) based on these illustrations.



| 3.2.1 | Identify the parts labelled B, C, D and E. | (4) |
|-------|---|-----|
| 3.2.2 | What product is formed when the structure in FIGURE 1 fuses with the part labelled D? | (1) |
| 3.2.3 | Indicate the gland labelled A which initiates the process in the part labelled B. | (1) |
| 3.2.4 | Name the TWO most important functions of the part labelled K. | (2) |
| 3.2.5 | Name THREE functions of the part labelled C. | (3) |

3.3 The following diagram represents the formation of proteins and shows children suffering from a nutritional disease.



| 3.3.1 | Distinguish between a <i>dipeptide</i> and a <i>polypeptide</i> . | (2) |
|-------|---|-----|
| 3.3.2 | Identify the nutritional disease that the children in the above diagram are suffering from. | (2) |
| 3.3.3 | Indicate how this condition can be prevented. | (1) |

3.4 A monozygotic black Percheron stallion was bred with a Hackney pony mare. The letter B represents the colour black and the letter b represents the colour red. Black is the dominant trait.

| | | Hackney pony mare | |
|----------|---|-------------------|----|
| stallion | | В | b |
| rcheron | В | Bb | Bb |
| Pe Pe | В | Bb | Bb |

- 3.4.1 Indicate the percentage of the F1 generation (offspring) that would show the black phenotype. (1)
- 3.4.2 What is the colour of the Hackney pony mare?

demand and price?

(1)

(2)

3.5 Demand and supply have a direct influence on the pricing of agricultural products. Use the information in the table below to answer the questions that follow.

| Price R | | | | | | | | | | |
|----------|-----|----|----|----|----|----|----|----|----|-----|
| | 10 | 20 | 30 | 40 | 50 | 60 | 70 | 80 | 90 | 100 |
| Quantity | | | | | | | | | | |
| demanded | 100 | 65 | 50 | 40 | 30 | 25 | 20 | 15 | 10 | 5 |

- 3.5.1 How many items are sold at the price of R50,00? (1)
 3.5.2 Compare the quantity of items that are sold at R100,00 and R50,00. What deductions can you make about the relationship between
- 3.5.3 Use the data provided in the table above to plot the demand curve. Use a line graph. (3)

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(1)

(2)

3.6

SCENARIO

HIV/Aids impacts on both subsistence and commercial farming. Because the disease is spreading rapidly, it is greatly affecting the farming community and agricultural production. Farm workers are dying in large numbers resulting in a decrease in the number of workers in the labour force. There is greater loss of skills and experience, workers are absent from work for longer periods and healthy workers have to work overtime. To sustain production, certain preventative measures must be taken by farm managers.

- 3.6.1 Indicate ONE way by which HIV/Aids will impact on the productivity of the labour force in the agricultural sector by referring to the scenario above.
- 3.6.2 Suggest TWO measures that you can advise farm managers to apply on how to limit the impact of HIV/Aids on productivity of farm labourers with reference to the scenario above.
- 3.6.3 The graph below represents the relationship between the infection rate of HIV/Aids and the productivity output of the labour force in the agricultural sector.



Time (Years)

Identify the graphs A and B by referring to the given data (scenario and graph) (2) [35]

QUESTION 4

Start this question on a NEW page.

4.1 Different organic compounds are indicated in the table below. Complete the table by filling in the missing parts.

| ORGANIC COMPOUND | MOLECULAR FORMULA | FUNCTIONAL GROUP |
|---------------------|----------------------|---------------------|
| Methanol | 4.1.1 | 4.1.2 |
| Ethanoic acid | 4.1.3 | 4.1.4 |

4.2

SCENARIO

Breeding methods like inbreeding and cross-breeding are also traditional methods of breeding that have been used over years to improve the quality of farm animals. Genetic engineering or modification is a new technique introduced to promote desirable characteristics in farm animals. This is done by inserting desirable DNA into the genes of another organism to change the characteristics of that organism.

Name THREE advantages that genetic modification will have in comparison to the indigenous methods of breeding.

(3)

(4)

4.3 Study the posters shown below and match each one to the appropriate pricing strategy from the given list.



THE PRICING STRATEGIES:

- I. **Price lining:** Using a limited number of prices for all goods on offer.
- II. **Promotional pricing:** Special offers to introduce goods, or set them apart from others.
- III. **Psychological pricing:** Giving odd prices to make it look like the customer is paying less, for example, R9,99 instead of R10,00.
- IV. **Loss leading:** Selling one product below cost to attract customers in the hope that they will buy other goods.

(4)

4.4 South Africa has a relatively high rate of unemployment. The government aims to create more jobs and develop skills to address this issue. However, many people find themselves unable to find a job. One way of earning money when you cannot find a job is to start your own farming enterprise. To be a successful entrepreneur, you need to have certain characteristics.

Look at the characteristics provided in the box below and identify any TWO of the most essential characteristics to possess for each of the following positions:

- a. Entrepreneur/Owner/Manager
- b. Farm labourer

| Financial skills | Human resource skills | |
|---|--|-----|
| Ability to work with your hands | Work individually | |
| Indecisive | Technically orientated | (4) |

- 4.5 Give THREE examples of laws/acts that were introduced after 1994 to address land issues.
- 4.6 Indigenous disease control and treatment is known as ethno-veterinary medicine. Name THREE advantages of using indigenous ways of treating farm animals.
- 4.7 Briefly outline how the young generation of South Africans can protect and sustain indigenous herbs for the treatment of animal diseases. (3)

 $\langle \mathbf{o} \rangle$

(3)

4.8 A veterinary officer observed the following conditions in farm animals as illustrated in the diagrams below.



- 4.8.1 What is the name of the deficiency diseases in the animals marked A and B?
- 4.8.2 Suggest the deficient mineral in animal A and the deficient vitamin in animal B that was responsible for these deficiency diseases.
- 4.9 There are different methods to supplement minerals in animal rations. Give the most suitable method of supplementation minerals in each of the following cases:
 - 4.9.1 A method of supplementing an iron deficiency in young pigs kept on concrete floors.
 - 4.9.2 Mineral provision where animals take in as many minerals as they require
- 4.10 The collection of semen from a male animal and placing it in the cervix/uterus of a female animal is known as artificial insemination. It involves the collection of semen, diluting and freezing it, thawing the semen and inseminating the female animal.

Indicate, by giving FIVE reasons, why this method of breeding has gained popularity among commercial farming enterprises.

(5) [**35**]

(2)

(2)

(1)

(1)

- TOTAL SECTION B: 105
 - GRAND TOTAL: 150

SECTION A

ANSWER SHEET

QUESTION 1.1

| 1.1.1 | А | В | С | D |
|--------|----|---|---|---|
| 1.1.2 | А | В | С | D |
| 1.1.3 | А | В | С | D |
| 1.1.4 | Α. | В | С | D |
| 1.1.5 | А | В | С | D |
| 1.1.6 | А | В | С | D |
| 1.1.7 | А | В | С | D |
| 1.1.8 | А | В | С | D |
| 1.1.9 | Α | В | С | D |
| 1.1.10 | А | В | С | D |

(10 x 2) (20)

QUESTION 1.2

| 1.2.1 | |
|-------|--|
| 1 | |
| 1.2.2 | |
| | |
| 1.2.3 | |
| | |
| 1.2.4 | |
| | |
| 125 | |
| 1.2.5 | |

(5 x 2) (10)

QUESTION 1.4

| 1.4.1 | |
|-------|-------------|
| 1.4.2 | |
| 1.4.3 | |
| 1.4.4 | |
| 1.4.5 | |
| | (5 x 1) (5) |

TOTAL SECTION A: 45

QUESTION 1.3

| 1.3.1 | |
|-------|--------------|
| 1.3.2 | |
| 1.3.3 | |
| 1.3.4 | |
| 1.3.5 | |
| | (5 x 2) (10) |