



education

Department:
Education
REPUBLIC OF SOUTH AFRICA

SENIOR CERTIFICATE EXAMINATION - 2006

AGRICULTURAL SCIENCE PAPER 2

STANDARD GRADE

OCTOBER/NOVEMBER 2006

802-2/2E

MARKS: 150

AGRICULTURAL SCIENCE SG: Paper 2

TIME: 2 hours



X10



This question paper consists of 9 pages.



INSTRUCTIONS AND INFORMATION

1. Answer ALL the questions.
2. This question paper consists of TWO sections: SECTION A and SECTION B.
3. Answer ALL the questions in the agricultural science context in the ANSWER BOOK provided.
4. Number your answers exactly as the questions are numbered.
5. Start each question on a NEW page.
6. Read the questions carefully and answer what is asked.
7. Non-programmable calculators may be used.
8. Write neatly and legibly.

SECTION A**QUESTION 1**

1.1 Various possible options are provided as answers for the following questions. Write only the letter (A - D) next to the question number (1.1.1 - 1.1.5) in the answer book, for example 1.1.6 D.

- 1.1.1 ONE of the following is NOT an agricultural production factor required to maximise production:
- A Soil
 - B Capital
 - C Market
 - D Management
- (2)
- 1.1.2 The stomach of a ruminant consists of four compartments. Which compartment is regarded as the true stomach?
- A Rumen
 - B Reticulum
 - C Abomasum
 - D Omasum
- (2)
- 1.1.3 Turbidity is caused by a high concentration of ... in water.
- A dissolved salts
 - B organic substances
 - C carbonates and bicarbonates
 - D dissolved gases
- (2)
- 1.1.4 The stomach of the pig secretes gastric juices which contain hydrochloric acid. This hydrochloric acid is responsible for changing ...
- A fats to fatty acids and glycerol.
 - B proteins to amino acids.
 - C soluble caseinogens to casein.
 - D sucrose to glucose and fructose.
- (2)
- 1.1.5 The gland which lies in the form of a ring around the urethra of a bull:
- A Cowper's gland
 - B Prostate
 - C Testis
 - D Seminal vesicle
- (2)

- 1.2 Give ONE word/term for each of the following descriptions:
- 1.2.1 The quantity of a particular product bought at a quoted price at a particular moment (2)
- 1.2.2 The mating of animals of different breeds, such as a Hereford bull and a Bonsmara cow (2)
- 1.2.3 A structure covered with transparent material to control the growing conditions of plants (2)
- 1.2.4 Artificial collection and transfer of semen from the male to the female reproductive organs (2)
- 1.2.5 The soil cultivation practice whereby an attempt is made to keep all plant residues on the field (2)
- 1.3 Choose a/an item/word(s) from COLUMN B that matches a/an item/word(s) in COLUMN A. Write only the letter (A - J) next to the question number (1.3.1 - 1.3.5) in the answer book, for example 1.3.6 K.

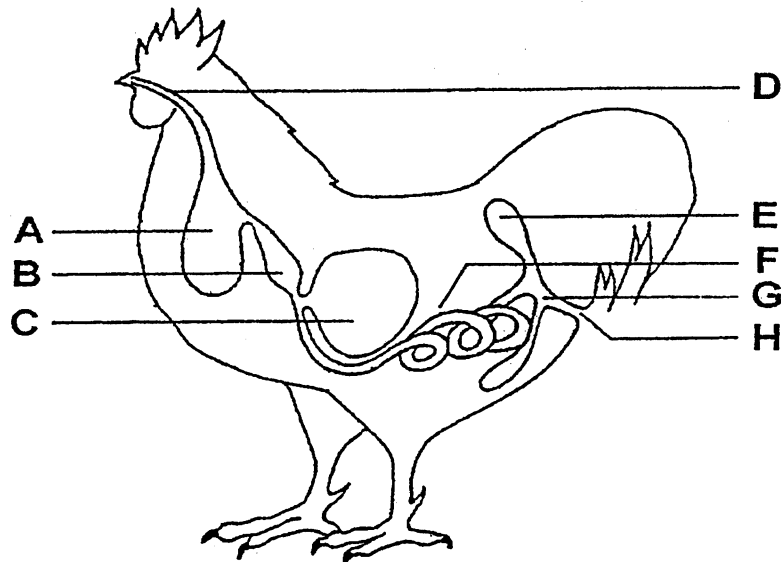
COLUMN A		COLUMN B	
1.3.1	Scrotum	A	drainage
1.3.2	Evaporation pan	B	sperm production
1.3.3	Credit	C	maturation of sperms
1.3.4	Testosterone	D	milk fever
1.3.5	Vitamin A	E	temperature control
		F	night blindness
		G	scheduled irrigation
		H	sperm deposition
		I	adequate leave
		J	borrowed money (5 x 2)

TOTAL SECTION A: 30

SECTION B**QUESTION 2: ANIMAL NUTRITION**

Start this question on a NEW page.

- 2.1 Study the following diagram of the digestive system of the fowl and answer the questions that follow:



- 2.1.1 Identify the parts labelled B to F. (5)
- 2.1.2 What are the functions of the parts labelled A and H? (2)
- 2.1.3 Which letter in the diagram corresponds to the 'true stomach' of the ruminant? (1)
- 2.2 Distinguish between concentrates and roughages. (4)
- 2.3 Name FIVE factors which determine the digestibility of animal feeds. (5)
- 2.4 The liver is an accessory gland to digestion and is essential to life. State FIVE functions performed by this gland. (5)

2.5 Calculate, using the following information, the digestible dry material content of the hay consumed by a cow:

Feed intake of the cow = 15 kg
Moisture content of the feed eaten = 15%
Amount of feed excreted = 6 kg
Moisture content of excreted feed = 20%

Show ALL the calculations. (5)

2.6 Answer the following questions on mineral nutrition:

2.6.1 Why do piglets that are born on concrete floors and never come into contact with soil, develop a blood shortage (anaemia)? (3)

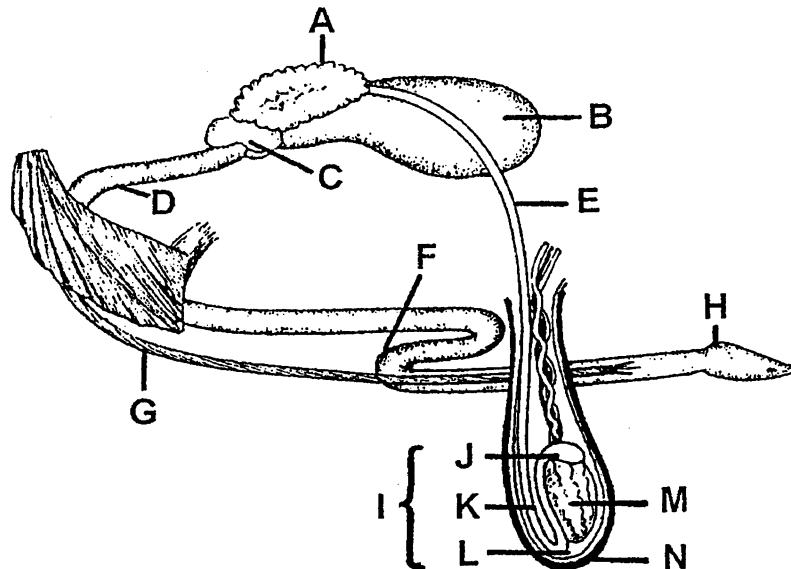
2.6.2 What can a pig farmer do to overcome this deficiency mentioned in QUESTION 2.6.1? (2)

2.6.3 Phosphorus deficiency is common in the animal producing areas of South Africa. State THREE functions of phosphorus in the animal body. (3)
[35]

QUESTION 3: ANIMAL REPRODUCTION

Start this question on a NEW page.

3.1 Study the following diagram of the reproductive organs of a bull, then answer the questions that follow:



3.1.1 Identify the reproductive organs labelled A, C, D, E and I. (5)

3.1.2 State ONE function of each of the organs labelled A, C, D, E and I. (5)

3.1.3 Sterility in bulls will lead to lowered conception rates in the cow herd. Discuss how each of the following factors affect sterility in bulls:

- (a) Congenital defects (2)
- (b) Climatic conditions (2)
- (c) Malnutrition (2)

3.2 Explain the function of the following hormones that are secreted by the female animal:

3.2.1 Progesterone (1)

3.2.2 Oestrogen (1)

3.2.3 Lutenising hormone (LH) (1)

- 3.3 Answer the following questions on artificial insemination (AI):
- 3.3.1 Heat spotting is critical for the successful use of artificial insemination (AI) in a dairy herd. Name SIX characteristics of oestrus that you would consider as being important for heat spotting. (6)
- 3.3.2 State FOUR requirements for the artificial insemination process to be successful. (4)
- 3.4 Explain what is meant by the following breeding methods:
- 3.4.1 Inbreeding (2)
- 3.4.2 Cross-breeding (2)
- 3.4.3 Indicate which ONE of the two breeding methods (inbreeding or cross-breeding) would be best applied to the following situations:
- (a) Commercial beef breeding (1)
- (b) Stud breeding (pure breeding) (1)
- [35]**

QUESTION 4: OPTIMAL RESOURCE UTILISATION

Start this question on a NEW page.

- 4.1 Pollution of the environment is an issue that is being addressed worldwide. Describe FIVE ways how injudicious (unwise) or careless agricultural practices can contribute to the pollution of the environment. (5)
- 4.2 The necessity of water for agricultural production and domestic purposes cannot be emphasised enough. Suggest THREE reasons why the government has undertaken the responsibility of building reservoirs (dams). (3)
- 4.3 Calculate the available soil moisture remaining in the soil, if the evaporation pan reading is 10 mm, the crop factor of export grapes is 0,7 and the moisture content was 90 mm the previous day. Show ALL the calculations. (4)
- 4.4 Justify, by giving FIVE reasons, why you would consider soil cultivation as an important operation in agriculture. (5)
- 4.5 Natural vegetation in Southern Africa can be divided into veld types. Name FIVE main types of natural veld. (5)
- 4.6 State THREE advantages of a drip irrigation system. (3)
- [25]**

QUESTION 5: AGRICULTURAL ECONOMICS

Start this question on a NEW page.

- 5.1 Read the following case study based on agricultural economics and answer the questions that follow:

A number of local agricultural co-operatives in one of the rural municipalities in South Africa have been financially supported by local government during their establishment. It has been realised that co-operatives cannot handle the marketing of agricultural products of the individual producers and still maintain low marketing costs.

- 5.1.1 As an agricultural advisor you tried to convince the co-operative manager that the implementation of a pool marketing system would be a solution to handle and sell products of individual producers. Give FIVE reasons why you suggested the implementation of this system to the manager. (5)
- 5.1.2 Explain how the pool system works with regard to co-operatives. (4)
- 5.2 Scarcity of capital remains a major problem which hinders agricultural production for emerging farmers. Indicate THREE possible ways, each with a relevant example, through which farmers can overcome this problem. (6)
- 5.3 State FOUR factors which influence the change of agricultural commodity supply at the market place. (4)
- 5.4 State FOUR functions of soil as a production factor. (4)
- 5.5 Name TWO types of temporary workers. (2)

[25]**TOTAL SECTION B: 120****GRAND TOTAL: 150**