



# education

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Department:  
Education  
**REPUBLIC OF SOUTH AFRICA**

**SENIOR CERTIFICATE EXAMINATION – 2008**

**AGRICULTURAL SCIENCE P2**

**HIGHER GRADE**

**MAY/JUNE 2008**

**MARKS: 200**

**TIME: 2 hours**

**This question paper consists of 14 pages.**

## **INSTRUCTIONS AND INFORMATION**

1. Answer ALL the questions.
2. This question paper consists of TWO sections, namely SECTION A and SECTION B.
3. Answer ALL the questions in an Agricultural Science context in the ANSWER BOOK provided.
4. Number the 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 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 A characteristic of roughage is that ...
- A it contains little digestible nutrients, less than 60% TDN.
  - B it is highly digestible in the absence of microbes.
  - C it retains a high percentage of nutrients at all stages of plant growth.
  - D it is permanently succulent.
- 1.1.2 The mineral essential for pigment formation in wool and hair:
- A Zinc
  - B Calcium
  - C Copper
  - D Potassium
- 1.1.3 The regular succession of different crops on the same piece of land for a number of years:
- A Monoculture
  - B Crop rotation
  - C Intercropping
  - D Intracropping
- 1.1.4 Which ONE of the following is NOT a source of energy?
- A Amino acids
  - B Nitrates
  - C Fatty acids
  - D Ammonium salts
- 1.1.5 The type of credit obtained to purchase production goods such as feed, fuel, fertilisers and other goods which are to be used within one production season:
- A Intermediate-term
  - B Medium-term
  - C Long-term
  - D Short-term

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- 1.1.6 The lowest price at which products may be sold in a controlled market, which guarantees a definite price for the producer:
- A Ceiling price
  - B Floor price
  - C Stabilisation fund
  - D Complete price control
- 1.1.7 The financial protection against unforeseeable events, such as sudden death, hail, fire, et cetera, that is required for the farmer or farming enterprise:
- A Estate duty
  - B Income tax
  - C Cash flow
  - D Insurance
- 1.1.8 Which ONE of the following is a physiological factor causing infertility in cows?
- A Hermaphrodite
  - B Double cervical canal
  - C Anoestrus
  - D Hypoplasia
- 1.1.9 A geographic factor that describes the slope and the altitude of an area and has an important influence on climate:
- A Terrain
  - B Contours
  - C Bare soil
  - D Grassland
- 1.1.10 A method of irrigation that utilises parallel soil ridges between which the irrigation water moves across the land in strips:
- A Micro-jet
  - B Centre-pivot
  - C Sprinkler
  - D Bed
- (10 x 2) (20)

- 1.2 Give ONE word/term for each of the following descriptions. Write only the word/term next to the question number (1.2.1 – 1.2.5) in the ANSWER BOOK.
- 1.2.1 The period that starts with fertilisation of the ovum and ends with parturition when the foetus is expelled
- 1.2.2 The skill or ability required for the process of managing the factors of production in any business enterprise
- 1.2.3 The veld type that is palatable to livestock throughout the year
- 1.2.4 The disease or condition found in fully-grown animals when too much calcium is removed from their skeletons
- 1.2.5 The enzyme that curdles milk in the abomasum of a ruminant (5 x 2) (10)
- 1.3 Change the underlined word(s) in each of the following statements. Write only the correct word(s) next to the question number (1.3.1 – 1.3.5) in the ANSWER BOOK.
- 1.3.1 Urea is a non-protein nitrogen that can be fed with carbohydrate-rich feed because it is less soluble and completely safe.
- 1.3.2 The additional quantity of feed that an animal requires over and above the maintenance ration, is known as the supplementary ration.
- 1.3.3 Fertilisation is the process by which a ripe ovum is released by the Graafian follicle from the surface of the ovary.
- 1.3.4 Under-capitalisation occurs in the situation where too much money is invested in capital goods in relation to other production factors.
- 1.3.5 Bare cultivation is an attempt to keep all plant residues on the soil surface during the whole process of cultivation. (5 x 2) (10)

- 1.4 Choose an item from COLUMN B that matches a description in COLUMN A. Write only the letter (A – H) next to the question number (1.4.1 – 1.4.5) in the ANSWER BOOK, for example 1.4.6 K.

COLUMN A		COLUMN B	
1.4.1	Acrosome	A	artificial insemination (AI)
1.4.2	Brucellosis	B	mule
1.4.3	Pistolette (Pistilet)	C	Bonsmara
1.4.4	Prolactin	D	spermatozoon
1.4.5	Specie crossing	E	ovulation
		F	infertility
		G	prostate gland
		H	milk production

(5 x 2) (10)

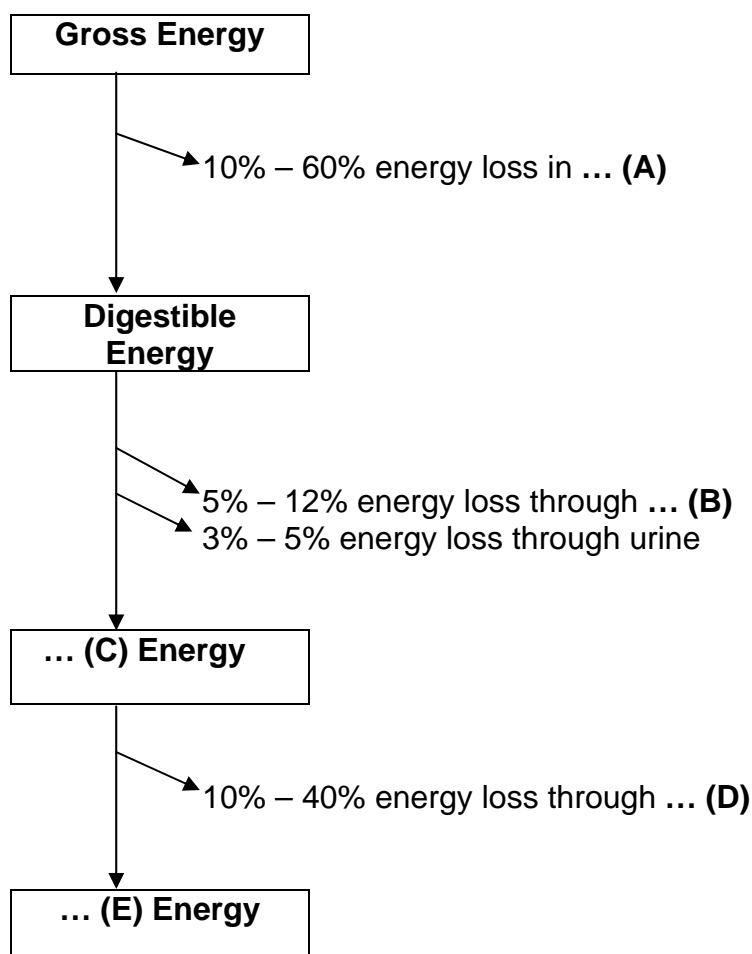
**TOTAL SECTION A: 50**

**SECTION B**

**QUESTION 2: ANIMAL NUTRITION**

Start this question on a NEW page.

2.1 The following is a flow diagram that represents the different measures of feed energy and the relation between them. Study it carefully and answer the questions that follow.



- 2.1.1 Complete the above diagram by identifying the missing words labelled A to E. (5)
- 2.1.2 Explain the difference between *gross energy* and *digestible energy*. (4)
- 2.1.3 The energy identified in E is used for certain functions in the body of an animal. State the TWO functions. (2)
- 2.2 Name FIVE functions of bile in the digestion of food. (5)

- 2.3 Lactating cows require certain nutrients. Explain how important the following nutrients are during the lactation period:
- 2.3.1 Proteins (2)
- 2.3.2 Carbohydrates (2)
- 2.3.3 Minerals (2)

2.4 Digestibility of feeds

- 2.4.1 Calculate the digestibility coefficient of a concentrate that is being fed to a dairy cow, using the following data:

- Intake of concentrate = 6 kg per day
- Moisture content of the concentrate = 5%
- Amount of dry material excreted = 1,5 kg

Show ALL calculations. (5)

- 2.4.2 Why is the digestibility coefficient in QUESTION 2.4.1 important to a dairy farmer? (3)

- 2.5 Look at the deficiency diseases listed below and indicate the name of the nutrient responsible for the deficiency. Also give a possible method of supplementing that nutrient in an animal.

Deficiency disease	Nutrient	Method of supplementation
2.5.1 Milk fever		
2.5.2 Anaemia		
2.5.3 Wasting disease		

(6)

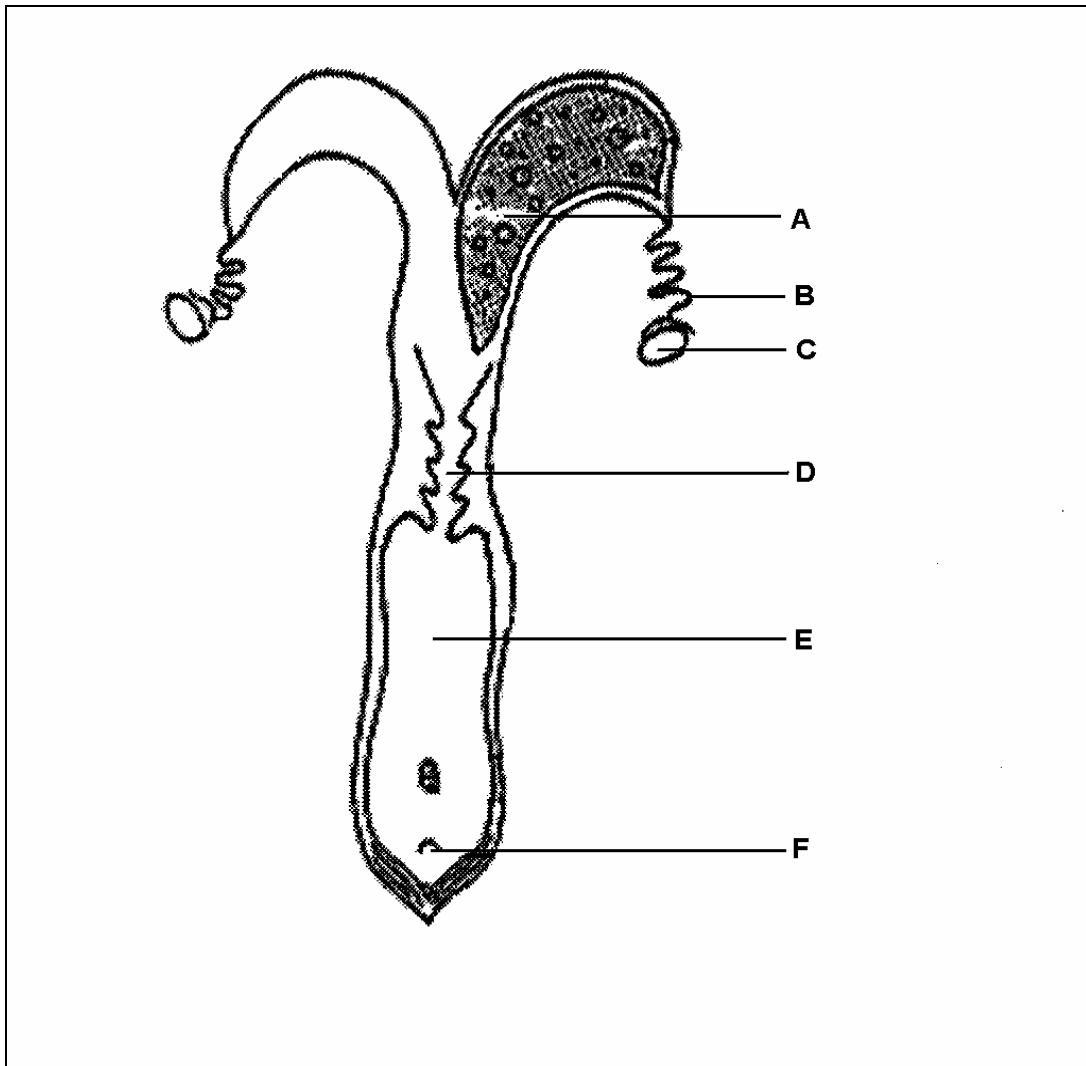
- 2.6 Explain the absorption of digested food in the small intestine of the fowl. (4)

**[40]**

**QUESTION 3: ANIMAL REPRODUCTION**

Start this question on a NEW page.

3.1 The following diagram represents the reproductive organs of a female animal:



3.1.1 Indicate the letter on the diagram for the following:

- (a) The place where fertilisation of the ovum takes place (1)
- (b) This part opens only during oestrus (1)
- (c) This part corresponds with the male reproductive organ (1)
- (d) The foetal membranes are attached here during pregnancy (1)
- (e) The primary organ of reproduction (1)
- (f) The place where semen is deposited during natural mating (1)

- 3.1.2 Explain the importance of the part labelled A during the pregnancy period of a cow. (4)
- 3.2 Answer the following questions regarding the accessory sex glands of a bull:
- 3.2.1 Name the part of the body where the accessory sex glands are situated. (1)
- 3.2.2 Name the largest accessory sex gland. (1)
- 3.2.3 Briefly discuss THREE functions of the largest accessory sex gland in QUESTION 3.2.2. (3)
- 3.2.4 State THREE functions of the prostate gland. (3)
- 3.3 Classify the following examples into the different animal breeding systems:
- 3.3.1 Homozygosis increases and heterozygosis decreases (2)
- 3.3.2 The crossing between two different species of animals (2)
- 3.3.3 The progeny are heterozygotic and do not breed 'pure' (2)
- 3.4 Mr Du Toit has just bought a bull to use for breeding purposes on his farm. Discuss FOUR factors that cause impotence (inability to copulate) in a bull with the farmer. (8)
- 3.5 What would you suggest to a dairy farmer to ensure that artificial insemination is a success? (4)
- 3.6 State FOUR symptoms of parturition (calving) in a pregnant cow. (4)
- [40]**

**QUESTION 4: OPTIMAL RESOURCE UTILISATION**

Start this question on a NEW page.

- 4.1 A group of farmers have just bought a farm for grazing animals. Briefly explain to these farmers the differences between plant succession and plant retrogression. (4)
- 4.2 Answer the following questions on irrigation:
- 4.2.1 Suggest the irrigation system/method suitable for each of the following situations:
- (a) Row crops in orchards are cultivated with a restricted amount of water. (1)
  - (b) Uniform or even distribution of water is required. (1)
  - (c) Water is very scarce and is used very economically. (1)
  - (d) Soil is very sandy or parts of the soil have different infiltration rates. (1)
- 4.2.2 Name ONE device a farmer may use to determine the time when plants need water through irrigation. (1)
- 4.2.3 Calculate the loss of water through evapotranspiration ( $E_t$ ) for a crop if the crop factor ( $f$ ) is 0,40 and the reading on the evaporation pan ( $E_o$ ) is 12 mm.  
Show ALL calculations. (3)
- 4.2.4 Evaluate the result obtained in QUESTION 4.2.3 in relation to irrigation scheduling. (3)
- 4.3 Vegetables are sometimes cultivated under controlled conditions in special structures covered with transparent material.
- 4.3.1 What is this structure called? (1)
- 4.3.2 Briefly discuss any FOUR advantages of this cultivation method. (4)

- 4.4 Answer the following questions regarding drainage systems:
- 4.4.1 Name THREE types of drainage systems. (3)
- 4.4.2 Discuss THREE precautionary measures that must be taken into consideration during the planning and maintenance of a drainage system. (6)
- 4.5 Soil surveys are critical to land utilisation planning. Name the SIX steps that are followed during the process of a soil survey. (6)
- [35]**

**QUESTION 5: AGRICULTURAL ECONOMICS**

Start this question on a NEW page.

- 5.1 A farmer continuously uses urea (fertiliser) on a piece of land to increase maize production. The amount of urea used and the yield of maize harvested are tabulated below:

<b>Applications of urea per hectare (in 100 kg bags)</b>	<b>Yield of maize per hectare (in tons)</b>
0	8
1	18
2	27
3	35
4	42
5	48
6	53
7	57
8	60
9	63
10	63

- 5.1.1 Use the information collected by the farmer in the above table to sketch a line graph. (8)
- 5.1.2 State the relevant law which is seen as a problem of soil and is shown in the line graph. (1)
- 5.1.3 Explain the problem stated in QUESTION 5.1.2. (3)
- 5.2 Different capital goods are used by the farmer to increase production. Examples of such capital goods are listed below:

implements; dam; cattle; animal feed

- Classify the above goods into the different categories for the types of capital. (4)

- 5.3 State FOUR advantages of a free-market system. (4)
- 5.4 Supply and demand are important in the marketing of agricultural products. Distinguish between the terms *supply* and *demand* of agricultural products. (4)
- 5.5 Discuss TWO types of temporary workers in agriculture using suitable examples for each. (6)
- 5.6 State FIVE principles that an entrepreneur can apply in order to improve management on the farm. (5)

**[35]****TOTAL SECTION B: 150****GRAND TOTAL: 200**