

## GAUTENG DEPARTMENT OF EDUCATION

## SENIOR CERTIFICATE EXAMINATION

## AGRICULTURAL SCIENCE SG

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 Possible Answers / Moontlike Antwoorde  
 Feb / Mar / Maart 2006
 

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## SECTION A

## QUESTION 1A

1.1	C	1.11	C	1.21	B
1.2	A	1.12	A	1.22	D
1.3	B	1.13	D	1.23	A
1.4	D	1.14	A	1.24	B
1.5	C	1.15	C	1.25	A
1.6	B	1.16	B		
1.7	C	1.17	B		
1.8	A	1.18	D		
1.9	D	1.19	B		
1.10	D	1.20	C or A/B		

25x2= (50)

## QUESTION 1B

1.26	Cryptorchidism
1.27	Keratomalaise
1.28	Emulsification
1.29	Parotid
1.30	Scrotum
1.31	Percolation/seepage
1.32	Soil structure
1.33	Band placing
1.34	Tensiometer
1.35	Drainage

10x2= (20)

## QUESTION 1C

1.36	G
1.37	E
1.38	B
1.39	C
1.40	G

(5)

**QUESTION 1D**

- |      |         |                |     |
|------|---------|----------------|-----|
| 1.41 | Budding |                | (1) |
| 1.4  | 1.      | eye            |     |
|      | 2.      | T-cut          |     |
|      | 3.      | root stem      | (4) |
|      | 4.      | plastic ribbon | (5) |

**TOTAL FOR SECTION A: [80]**

## SECTION B

**QUESTION 2**

- |     |       |   |                 |
|-----|-------|---|-----------------|
| 2.1 | 2.1.1 | Calcium   |                 |
|     | 2.1.2 | Vitamin K   |                 |
|     | 2.1.3 | Potassium   |                 |
|     | 2.1.4 | Vitamin B1 and B2   |                 |
|     | 2.1.5 | Iron  |                 |
|     | 2.1.6 | Vitamin B12   |                 |
|     | 2.1.7 | Ca/P/Mg   |                 |
|     | 2.1.8 | Vitamin D   | (8)             |
| 2.2 | 2.2.1 | – Drinking water<br>– Metabolic water<br>– Water in feeds   | (2)             |
|     | 2.2.2 | – Solvent during absorption<br>– Medium for chemical reactions<br>– Medium for excretion as well as secretion<br>– Transport medium<br>– Regulates body temperature<br>– Lubricates joints<br>– Shock absorber<br>– Essential for hearing and sight   | (Five only) (5) |
| 2.3 | 2.3.1 | He has to check lower incisors.<br><br>1. One pair of permanent incisors = animal younger than 1 year 10 months<br>2. Two pairs of permanent incisors = animal younger than 2 years 6 months<br>3. Three pairs of permanent incisors = animal younger than 3 years<br>4. Four pairs of permanent incisors = animal younger than 4 years | (4)             |
| 2.4 | 2.4.1 | <b>Salivary glands</b><br>– Parotid<br>– Sublingual<br>– Submandibularis  | (3)             |

- 2.4.2 **Functions of digestive juice (saliva)**
- Serves as lubricant and keeps mouth moist
  - Helps in forming of bolus
  - Supplies an alkaline medium for the action of amylase
  - Amylase converts starch to maltose
  - Neutralises the acids in the mouth (4)
- 2.4.3
- a) simple stomach (1)
  - b) cardiac, fundic, pyloric regions (3)
  - c) hydrochloric acid/gastric juice (pepsin, rennin) (1)
- 2.4.4 bile (1)
- 2.4.5
- Formation of faeces
  - Fermentation
  - B Vitamins are synthesized
  - Water absorption
  - Bacterial fermentation (Two only) (2)
- 2.4.6
- c. Oesophagus
  - d. Simple stomach
  - e. Pylorus sphincter
  - f. Pancreas
  - g. Liver (5)
- 2.5 **Factors influencing the digestibility of a feed**
- Ratio composition
  - Type of animal
  - Quality taken in
  - Individuality
  - Feed preparation
  - Age of the plant
  - Ration composition (Six only) (6)
  -
- [45]**

### QUESTION 3

- 3.1 Forms of water loss prevented
- 3.1.1 Run-off (1)
  - 3.1.2 Transpiration (1)
  - 3.1.3 Surface evaporation/run-off (1)
  - 3.1.4 Percolation/run-off (1)
  - 3.1.5 Transpiration (1)
- 3.2 **Accessible water** is that quantity of water which is held at a moisture tension between capacity and wilting point e.g. capillary water/cohesion water. (2)
- Inaccessible water** is that quantity of water in soil at a point equal to wilting point and is completely unavailable to plants, e.g. adhesion water / or hygroscopic water. (2)

- 3.3 3.3.1 A. Orientation of land/slope  
 B. Radiation or reflection of the sun's energy  
 C. Vegetation  
 D. Soil depth (4)
- 3.3.2 – Water/Moisture content  
 – Soil colour  
 – Seasonal variation  
 – Texture and structure of soil (4)
- 3.4 3.4.1 Field method  
 – After a representative sample has been taken from the top and subsoils, mixed and moistened  
 – A small quantity of moist soil is rubbed between the thumb and forefinger to test for a presence of sand particles  
 – Moist sample rolled into a sausage. (6)
- 3.4.2 Texture classes  
 A. Clay  
 B. Sandy clay  
 C. Sandy clay loam  
 D. Sandy loam (4)
- 3.5 3.5.1 Soil profile  
 E. O horizon  
 F. A horizon  
 G. B horizon  
 H. C horizon  
 I. R horizon (5)
- 3.5.2 a) **Soil profile** is a vertical section through soil showing the different major horizons (2)  
 b) **Soil horizon** is a layer of soil, more or less parallel to the earth's surface (2)
- 3.6 3.6.1 A. Pipe drains  
 B. Rock drains  
 C. Open drains (3)
- 3.6.2 **Drainage** is an artificial removal of excess free water from the soil surface and root zone. (2)
- 3.6.3 Advantages of open drains  
 – Inexpensive to construct  
 – Water from the surface is easily removed  
 – Big slope unnecessary.  
 – Suitable as a temporary measure (three only) (3)

## QUESTION 4

- 4.1 4.1.1 **Photosynthesis:**  
 – Trellising  
 – Pruning  
 – Thinning out or using greenhouses (3)
- 4.1.2 Chloroplast (1)
- 4.1.3 Requirements of photosynthesis  
 – Solar energy  
 – Water  
 – CO<sub>2</sub>  
 – Chlorophyll (4)
- 4.2 Importance of phosphorus  
 – Stimulates growth tips and root system  
 – Stimulates flower formation and ripening of fruit  
 – Improves quality of products  
 – Improves plant resistance to fungous diseases  
 – Unnatural dark-green leaves (Four only) (4)
- 4.3 4.3.1 Raw phosphate (1)  
 4.3.2 Super phosphate (1)
- 4.4 Price of fertilizer  
 % Nutrient  
 =  $\frac{R350}{\text{ton}}$   
 10,5% phosphate  
 = R33,33c/kg (3)
- 4.5 4.5.1 Bisexual. Possesses both stamen (male part) and pistil (female part). (3)
- 4.5.2 a) Anther  
 b) Palea  
 c) Stigma  
 d) Filament  
 e) Swelling bodies with ovary  
 f) Lemma (6)

4.5.3

Monocotyledonous flower	Dicotyledonous flower
<ul style="list-style-type: none"> <li>– Petals absent</li> <li>– Pedicel absent</li> <li>– No receptacle</li> <li>– Gluma for protection</li> <li>– Large anthers</li> <li>– Large feathery stigma</li> </ul>	<ul style="list-style-type: none"> <li>– Brightly coloured petals</li> <li>– Pedicel connects flower to plant</li> <li>– Receptacle carries various corollas</li> <li>– Sepal corolla for protection</li> <li>– Small sticky stigma</li> </ul>
	(Four only) (8)

- 4.6 4.6.1 A. Tuber  
B. Runner  
C. Rhizome  
D. Bulb  
E. Sucker (5)

4.7 4.7.1 Grafting: The transfer of a part of one plant to another plant the same botanical species.

4.7.2 Artificial cross pollination: The crossing of selected parent plants by man with the aim of breeding a new cultivar

(4)  
[43]

### QUESTION 5

- 5.1 5.1.1 a. Uterine horn  
b. Cranucle  
c. Fallopian tube  
d. Infundibulum  
e. Ovary  
f. Cervix  
g. Vagina  
h. Urethra  
i. Vulva (9)

- 5.1.2 a) f  
b) e  
c) c  
d) d (4)

5.2	Oestrus	Pro-oestrus
	<ul style="list-style-type: none"> <li>- lasts 18 hours</li> <li>- visible signs of heat</li> <li>- cow allows mating</li> <li>- LH cause ripe follicle to burst</li> </ul>	<ul style="list-style-type: none"> <li>- lasts 2 – 3 days</li> <li>- development of graafian follicle</li> <li>- FSH enhances and stimulates development of graafian follicle</li> <li>- Oestrogen prepares uterus for reception of fertilized ovum.</li> </ul>

(8)

5.3 Anatomical defects

- Hypoplasia of the sex organs
- Double cervical canal
- Prolapse of the vagina
- Hermaphrodite
- Free martins
- Abnormalities of the hymen (6)

- 5.4 Causes of sterility in bulls
- Climatic conditions
  - Infections of sex organs/genital tract
  - Malnutrition and exhaustion
  - Disease
  - Congenital defects (5)
- 5.5 Signs of birth
- Loss of appetite
  - Restlessness
  - Urinates and defecates frequently
  - Cow isolates herself, chases other cows away
  - Nesting behaviour
  - Leaking milk and visible mucous strings
  - Signs of discomfort (Five only) (5)
- 5.6 5.6.1 Inbreeding: Mating of closely related animals, e.g. mother and son (2)
- 5.6.2 Line-breeding: Is a less rigorous form of inbreeding and the purpose thereof is to retain the relationship with an outstanding ancestor (2)
- 5.6.3 Advantages of inbreeding
- Obtain uniform blood lines
  - Increases heredity power
  - Eliminates undesirable characteristics from a herd
  - Increases the number of homozygotic gene pairs (3)
- [44]**

### QUESTION 6

- 6.1 Functions of soil
- Stores and releases water for plants
  - Provides air for respiration
  - Releases nutrients
  - Growth medium for plants
  - Allows water infiltration (4)
- 6.2 Aspects of climate
- Humidity
  - Light
  - Temperature
  - Wind
  - Rainfall (5)

- 6.3 Types of veld
- Scrub
  - Semi desert
  - Grassland
  - Savannah
  - Forest (5)
- 6.4 6.4.1 Flood irrigation (1)
- 6.4.2 – Furrow (2)
- Bed (2)
- 6.4.3 Advantages
- Low development expenditure
  - Little labour needed
  - Reasonable amount of water applied in short time
  - Saline water less harmful to plants
  - Water correctly measured (4)
- Disadvantages
- More water is applied than necessary
  - Over-irrigation occurs at top and bottom end of furrows
  - Salination and waterlogging are a danger
  - Weed-killers and insecticides cannot be applied through irrigation water. (4)
- 6.5 6.5.1 **Crop rotation** is the cultivation of different crops in succession on the same land. (1)
- 6.5.2 – Labour situation
- Transport facilities
  - Management skills of the farmer
  - Demand for the crop, market price, and correct rotation order (4)
- 6.6 Soil erosion factors
- Veld fires
  - Overgrazing
  - Soil nature
  - Steep slopes
  - Climate
  - Injudicious cultivation (5)



6.7 Production factors

- Soil
- Labour
- Capital
- Management (4)

6.8 Disadvantages of free marketing

- Prices may fluctuate
  - High marketing costs
  - Marketing responsibility rests on the producer
  - Wrong production decisions result in huge financial losses
  - Cartels are formed and consumers are exploited
  - Small bargaining power as an individual (5)
- [44]**

**TOTAL FOR SECTION B: [220]**

**TOTAL: 300**