



education

Department:
Education
REPUBLIC OF SOUTH AFRICA

SENIOR CERTIFICATE EXAMINATION – 2008

AGRICULTURAL SCIENCE P2

STANDARD GRADE

MAY/JUNE 2008

MEMORANDUM

MARKS: 150

This memorandum consists of 11 pages.

SECTION A

QUESTION 1

1.1 Multiple choice questions

1.1.1 B✓✓ (2)

1.1.2 C✓✓ (2)

1.1.3 C✓✓ (2)

1.1.4 D✓✓ (2)

1.1.5 A✓✓ (2)

[10]

1.2 Correct terms

1.2.1 Crop✓✓ (2)

1.2.2 Enterocrynin✓✓ (2)

1.2.3 Supply✓✓ (2)

1.2.4 Crop factor✓✓ (2)

1.2.5 Pioneer vegetation/plants✓✓ (2)

[10]

1.3 Matching the columns

1.3.1 E✓✓ (2)

1.3.2 G✓✓ (2)

1.3.3 A✓✓ (2)

1.3.4 H✓✓ (2)

1.3.5 C✓✓ (2)

[10]

TOTAL SECTION A: 30

SECTION B**QUESTION 2 : ANIMAL NUTRITION**

2.1 Digestive tracts of farm animals:

2.1.1 (a) – Simple stomach/monogastric/non-ruminant/any type of poultry stomach✓ (1)

(b) – Simple stomach/monogastric/non-ruminant/pig stomach/dog stomach✓ (1)

(c) – complex stomach/ruminant stomach/cattle/sheep/goat stomach✓ (1)

2.1.2 True stomach:

(i) --- A✓ (1)

(iii) --- H✓ (1)

2.1.3 Enzymatic digestion takes place✓ (1)

Gastric juice is secreted✓ (1)

2.1.4 Pyloric valve/sphincter muscle✓ (1)

2.1.5 Protozoa✓ (1)

Bacteria✓ (1)

2.2 Nutritive ratio:

2.2.1 Nutritive ratio (NR) = $1 : \frac{72 - 8}{8}$ ✓
= $1 : \frac{64}{8}$ ✓
= $1 : 8$ ✓ ✓ (4)2.2.2 - the nutritive ratio is wide because it is above 1: 6✓
- the feed sample is suitable for maintenance or fattening✓
- the feed sample is not suitable for production or growth ✓ (3)

2.3 Vitamin A:

2.3.1 Carotene✓ (1)

2.3.2 -carotene is destroyed very easily in presence of sunlight ✓
- by oxidation✓ (2)

2.3.3 Green lucerne✓
Yellow maize✓
Carrots✓
Pumpkin✓
Green pasture✓ (Any 2) (2)

2.3.4 Normal vision sharpness✓
- building block of the pigment in the rods of the retina of the eye✓
Normal bone formation✓
- plays an important role in the control of bone growth✓
Maintenance of epithelial tissues✓
- required for healthy mucus membrane in the body, offering resistance to bacterial infection✓
Normal reproduction✓
- required for the fertility of both sexes, development of the foetus and the hatching of eggs✓ (Any 2 x 2 marks) (4)

2.4 - source of non-protein nitrogen for utilization by microbes✓
- concentrated source of nitrogen for amino acid or protein synthesis/formation✓
- cheap protein source for ruminants.✓ (3)

2.5 Roughages:

2.5.1 - cheapest source of feed✓
- provide bulkiness to the ration✓
- enhances rumen development in young animals✓
- ruminants are dependent on roughages✓
- dry roughages prevent bloating in ruminants✓
- causing saving in concentrate feeding✓
- cheapest source of vitamin A and D/minerals✓ (Any 4) (4)

- 3.1.5 Follicle stimulating hormone (FSH) ✓
Luteinizing hormone (LH) ✓ (2)
- 3.2 Artificial insemination:
- 3.2.1 - viable, healthy and disease-free semen ✓
- correct technique ✓
- appropriate sterile apparatus must be used ✓
- timeous heat spotting / insemination must take place at the correct time during the oestrus cycle ✓ (Any 3) (3)
- 3.2.2 - artificial vagina ✓
- electrical stimulation ✓ (2)
- 3.2.3 - provide nutrients for the sperm ✓
- protects the sperm against changes in pH and temperature ✓
- prevent bacterial growth ✓
- maintain the viability of sperm ✓
- increase the volume of the semen ✓ (Any 4) (4)
- 3.3 - greater production than pure breeds ✓
- hybrid vigour ✓
- faster growth rates / higher weaning weights ✓
- greater fertility ✓
- greater resistance to diseases / stronger constitution ✓
- better adaptation ✓
- better food utilization ✓
- possess better motherly instincts ✓
- development of new breeds ✓ (Any 5) (5)
- 3.4 Congenital defects:
- hypoplasia of the sex organs / underdevelopment of some part of sex system ✓
- Cryptorchidism / one or both testes remain in abdominal cavity and do not descend ✓
- sperm defects / poor quality, acrosome defects, loose head caps ✓
- scrotal hernias ✓ (Any 3) (3)

3.5 Libido in bulls:

3.5.1 Over work / exhaustion

- energy is spent on searching for the cow on heat and the mating process✓
- servicing too many cows / incorrect bull:cow ratio✓
- walking long distances for food or water / larger camps (Any 2) (2)

3.5.2 Diseases:

- diseases associated with high temperatures (e.g. tick-borne diseases, lumpy skin disease) ✓
- mineral deficiency (e.g. anaemia) will cause the bull's libido to decline✓
- foot rot or arthritis / inflammation of joints will prevent mounting because of the pain✓ (Any 2) (2)

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QUESTION 4 : OPTIMAL RESOURCE UTILISATION

4.1 Principles to be considered on a crop to cultivate:

4.1.1

- crop must thrive in the climate✓
- crop must thrive in the type of soil✓
- type of farming practiced in the area✓
- management skills of the farmer✓ (Any 2) (2)

4.1.2

- effective transport must be available especially if the crop is perishable✓
- sufficient labour must be available if the production of the crop is labour intensive✓
- correct rotation order of crops / succession of crops / deep rooted followed by shallow rooted crops✓
- producer prices✓
- crop demand/ market outlet✓ (Any 3) (3)

- 4.2
- loosen soil for better root penetration✓
 - prepare a proper seed-bed✓
 - prepare land for surface-flow irrigation and to ensure faster infiltration✓
 - incorporate lime and fertilizers into the soil✓
 - incorporate organic material of the previous crop into the soil✓
 - control weeds✓
 - better aeration✓
 - destroy soil crust, ensuring proper water infiltration✓
 - destroy impermeable layer in the subsoil✓
- (5)
(Any 5)
- 4.3
- rainfall✓
 - humidity✓
 - sunlight / light✓
 - temperature✓
 - wind✓
- (5)
- 4.4.
- contour banks to reduce water flow on sloping and high rainfall areas✓ ✓
 - prevent deforestation, cutting of trees must be controlled to prevent exposure of soil to rainfall✓ ✓
 - prevent veld fires or burning, only when required for management practices✓ ✓
 - prevent overgrazing by applying the correct stocking rates, rotational grazing should be practiced✓ ✓
 - the planting of trees as wind breakers to prevent wind erosion✓ ✓
- (Any 2 x 2) (4)
- 4.5
- use of pesticides in too higher concentrations✓
 - injudicious application of pesticides✓
 - unnecessary application of pesticides✓
 - incorrect irrigation practices e.g. flood irrigation✓
 - soil erosion through silt pollutes the drinking water✓
 - over-grazing leads to an increase in unwanted and poisonous plant species✓
 - application of excess quantities of fertilizer✓
 - discarding or dumping of empty chemical containers in unsafe places✓
 - incorrect storage of chemicals near food or people✓
- (Any 6) (6)

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QUESTION 5 : AGRICULTURAL ECONOMICS

5.1 Demand and supply graphs:

5.1.1 Demand✓ (1)

- 5.1.2 - when the price of tomatoes is high, the demand is low✓
 - when the price of tomatoes is low, the demand is high✓ (2)

5.1.3 B✓ (1)

- 5.1.4 - when the price of tomatoes is high, (increases) the supply is high /
 increases✓
 - when the price of tomatoes is low, (decreases) the supply is low /
 decreases✓ (2)

5.2 Farm labour:

5.2.1 Scarcity of labour:

- better working conditions would motivate labour to stay on the land✓
 - better living / housing conditions would satisfy basic needs to motivate labour to remain on the land✓
 - better wages / salaries to keep up with cost of living✓
 - better education facilities for the children to stay on the land✓
- (Any 2) (2)

5.2.2 Lack of skills:

- appropriate skills training on farm by service providers will motivate labour and improve production✓
 - specialized training on machinery will improve production and efficiency✓
 - labour should be trained in a specific number of tasks to improve efficiency and productivity and not in a wide variety of tasks✓
- (Any 2) (2)

- 5.3 - planning✓
 - organisation and co-ordination✓
 - motivation✓
 - decision making✓
 - control✓ (5)

5.4 Farm labour:

5.4.1 Fixed capital:

- which is invested in things of a permanent nature i.e. durable assets / invested over a long period ✓
- **ONE of the following examples:** land, fencing, buildings, infrastructure, boreholes, pumps, canals, orchards, vineyards, plantations, windmill ✓

(2)

5.4.2 Movable capital:

- capital of a less permanent nature that is medium term ✓
- **One of the following examples:** livestock, implements, machinery, equipment or any relevant example ✓

(2)

5.4.3 Working/floating capital:

- this form is very short term in nature and is easily used or consumed in one production season ✓
- **One of the following examples:** animal feed, fertilizer, dip, seed, pesticide, wages, money for repairs, transport costs ✓

(2)

- 5.5
- sales are usually for cash ✓
 - usually very little delay in receiving payment / producers receive payment on the spot or immediately ✓
 - entrepreneur can show initiative and drive ✓
 - stimulate entrepreneur to work harder ✓
 - middlemen are limited or eliminated ✓
 - production of quality products
 - provides job opportunities for many young entrepreneurs (Any 4)

(4)

[25]

TOTAL SECTION B: 120**GRAND TOTAL : 150**