JAMES RUSE

GESTA NON VERBA

2011
TRIAL HIGHER SCHOOL
CERTIFICATE EXAMINATION

Agriculture

General Instructions

- Reading time – 5 minutes
- Working time – 3 hours
- Write using blue or black pen
- Board-approved calculators may be used
- Write your Student Number at the top of this page

Total marks - 100

Section I – CORE **(80 marks)**
Part A – 20 marks
- Attempt questions 1 – 20
- Allow about 20 minutes for this section

Part B – 60 marks
- Attempt questions 21 – 27
- Allow about 110 minutes for this section

Section II – ELECTIVES **(20 marks)**
- Attempt ONE question from questions 28 – 30
- Allow about 50 minutes for this section

Section I – 80 marks
Part A – 20 marks
Attempt Questions 1 – 20
Allow about 20 minutes for this section
Use the multiple-choice answer sheet for Questions 1-20

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1. What is the function of Rhizobia bacteria in legume roots?

a) To increase soil nitrogen
b) To convert urea to nitrate for plants to use
c) To convert nitrogen in soil air to ammonia
d) To make soil nitrate available to plants

2. Which of the following best describes an Integrated Pest Management Program?

a) Using organic methods to manage pests
b) Using a range of strategies to manage a pest
c) Using a range of chemicals to control a pest
d) Using an introduced species to manage a pest

3. Which of the following plant hormones is used as a fruit ripening agent in controlled atmospheric containers?

a) Auxin
b) Gibberellins
c) Cytokinin
d) Ethylene

4. Which of the following statements regarding photosynthesis is incorrect?

a) Photosynthesis requires carbon dioxide and its concentration effects the rate of photosynthesis
b) Photosynthesis requires oxygen and its rate depends on the oxygen concentration
c) Photosynthesis requires water and its availability effects photosynthetic rate
d) Light intensity influences photosynthetic rate

5. Many farmers use artificial insemination in their flocks and herds.
Which of the following statements is **NOT** true of artificial insemination?

a) It decreases the size of the gene pool, thus reducing the chances of inbreeding
b) It allows farmers to more easily conduct cross breeding programs on their farms
c) It helps in the eradication and prevention of certain venereal diseases in animals
d) Semen can be transported around the world, this allowing famers access to a wider range of genetics.

6. Some farm animals breed throughout the year while others are seasonal breeders, only becoming sexually active for a part of the year.
Which environmental factor controls this seasonal breeding?

a) Temperature
b) Daylength
c) Rainfall
d) Food availability

7. Why are Integrated Pest Management systems vital?

a) They target one control method
b) They utilise organic principles
c) They are included in Quality Assurance programs
d) They can reduce chemical use significantly

8. Which ruminant stomach most closely resembles the true monogastric stomach?

a) Abomasum
b) Omasum
c) Reticulum
d) Rumen

9. Which of the following livestock have the most efficient Feed Conversion Ratio?

a) Temperate cattle (Bos Taurus)
b) Tropical cattle (Bos Indicus)
c) Chickens
d) Sheep

10. The digestible energy in a feed is:

a) Food energy
b) Absorbed energy
c) Available energy
d) Energy for maintenance and production

11. The nutrient required by animals that helps in tissue and muscle growth is

a) Carbohydrates
b) Fats
c) Protein
d) Vitamins and minerals

12. A common method used in animal disease prevention is:

a) Drenching
b) Vaccination
c) Administering antibiotics
d) Culling

13. The validity of a trial can be increased by using a statistical test. Which of the following is a statistical test?

a) Control
b) Standard error
c) Replication
d) Randomization

14. Students set up the following experiment:

4 pots received either1 wheat seed, 3 seeds, 4 seeds or 6 seeds.
Each pot was given the same amount of water, nutrients and light for the entire growing period
The trial was replicated 6 times
At the conclusion of the experiment, grain yield was measured

What was this trial used to determine?

a) The effect of density on plant yield
b) The effect of nutrients on plant yield
c) The effect of time on plant yield
d) Competition for water

15. Which of the following is the best experimental design to test the effect of temperature on photosynthetic rate?

a) Growing one plant of variety A in a glasshouse and comparing it with one plant of variety B grown outside
b) Growing ten plants of variety A in a glasshouse and comparing them with ten plants of variety B grown outside
c) Growing one plant of variety A in a glasshouse and comparing it with one plant of variety A grown outside
d) Growing ten plants of variety A in a glasshouse and comparing them with ten plants of variety A grown outside

16. One benefit of repeating an experiment is:

a) Allows for more plants to be grown
b) Increases the accuracy of data collected
c) Decreases the accuracy of data collected
d) Allows for less plants to be grown

17. Below is an extract from an agricultural company's website

Baiada Poultry Pty Limited is a privately owned Australian company which provides premium quality poultry products throughout Australia.
Our business operations include Broiler & Breeder Farms, Hatcheries, Processing Plants, Feedmilling and Protein Recovery. Our products include sales of live poultry including breeding stock, poultry feed, fertile eggs, day old chickens, primary processed chicken (raw) and further processed chicken products and pet food.

What is the best description of this company's marketing strategy?

a) A cooperative
b) A family farm
c) Vertically integrated
d) A marketing board

18. An advertisement in a local newspaper:

Lovedale Beef Tastes Better!
Organically grown with loving care
Produced from happy animals eating only the pastures
Place your order by ringing 0299999111 or find us on the web
lovedale@somewebsite.com

A farmer places the above advertisement in a local newspaper for the product that they are producing.

Why would a farmer bother to place such an advertisement in a local newspaper?

a) Advertising would increase demand for the product which they are producing by making more potential customers aware of the product.
b) Advertising would increase the supply of the product in the local area as more people will want it
c) The advertisement would make more people aware that organically grown beef is always produced from contented animals with love and care
d) The advertisement would allow the price per kilogram the customer pays to decrease as the supply for that product increases

19. Gross margins are a management tool based on:

a) Whole farm profit and operating loss
b) Fixed costs and depreciation
c) Variable costs and enterprise gross income
d) Parametric budgets and producer offsets

20. Which of the following is the LAW OF DEMAND?

a) At HIGH prices, consumers buy more of the product; and as market process DECREASE, less of the product is purchased
b) As producers SUPPLY more of the product, consumers DEMAND more product
c) At LOW prices, consumers buy more of the product; and as the prices INCREASE, less of the product is purchased.
d) Producers are willing to SUPPLY more of the product onto the market as market prices INCREASE

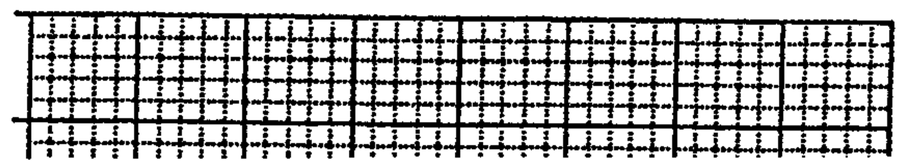
Section I (continued)
Part B – 60 marks
Attempt Questions 21-27
Allow about 1 hour and 50 minutes for this part
Answer the questions in the spaces provided. These spaces provide guidance for the expected length of response.

Question 21 (7 marks)
A trial was conducted at Gilgandra to compare the performance of three drought tolerant varieties of wheat. Each variety received the same amount of fertiliser, water, sunlight and all environmental conditions were consistent for each variety.

The results of the experiment conducted are provided in the table below

Variety of Wheat	Average Yield (t/ha)	Standard Deviation
Sunshine	10.0	8.1
Better harvest	8.0	1.4
Golden	12.0	5.2

a) Construct an appropriate graph representing the average yield from the table above (2 marks)



b) What does the standard deviation tell you about the results from the wheat variety Better Harvest? (1 mark)

c) Outline the role of TWO components of experimental design that may have been used in the above wheat trial (4 marks)

Question 22 (12 marks)
a) You have conducted a firsthand investigation into **the effect of light on plant growth**. STATE the conclusion of the experiment and suggest one improvement for the experiment. (2 marks)

b) Describe TWO major components of interference in plant communities. (4 marks)

(c) Identify a commercial application for TWO named plant hormones and EXPLAIN their role in the manipulation of plant production. (6 marks)

Question 23 (6 marks)

Discuss control methods used in an Integrated Pest Management (IPM) program for a named pest or disease of a plant production system you have studied.

Name of plant production system:
Causative organism:

Question 24 (7 marks)

a) (i) Distinguish between the terms 'permanent stunting' and 'compensatory growth'. (1 mark)

a) (ii) Identify from the following Agricultural Chemical label, some information which relates to 'safe practice' and some information which relates to 'correct usage'. (2 marks)

COOPERS®

PARAMAX®

POUR-ON FOR BEEF AND DAIRY CATTLE

For the treatment and control of ivermectin sensitive gastrointestinal nematodes (including inhibited immature *Ostertagia ostertagi*), lungworms (*Dictyocaulus viviparus*), eyeworms (*Thelazia* spp.), sucking and biting lice, chorioptic and sarcoptic mange mites, buffalo flies (*Haematobia irritans exigua*) and cattle ticks (*Boophilus microplus*).

DIRECTIONS FOR USE:

Restraints

DO NOT USE in pregnant cows less than 7 days before calving.

READ THE ENCLOSED LEAFLET BEFORE USING THIS PRODUCT.

DOSAGE:

COOPERS PARAMAX POUR-ON FOR BEEF AND DAIRY CATTLE is for external application to cattle. Do not use in other species. The formulation should be applied along the topline in a narrow strip extending from the withers to the tailhead.

The dose rate is 1mL for each 10kg of liveweight. This bottle contains enough solution to treat 40 cattle of 250kg liveweight.

Dose the mob according to the heaviest animal by liveweight in each group (cows, bulls, calves, heifers etc.). Do not underdose. When there is a large variation in size within the group, draft into two or more lines based on bodyweight, to avoid overdosage. Cattle should be weighed with either scales or with a weighband.

Liveweight (kg)	Dose Vol (mL)	This pack treats (head)
<100kg	1mL/10kg	≥100
101–150	15	66
151–200	20	50
201–250	25	40
251–300	30	33
301–350	35	28
351–400	40	25
401–450	45	22
451–500	50	20
501–550	55	18
551–600	60	16
601–650	65	15

Heavier animals (for example, mature bulls) should receive an additional 5mL for each 50kg over 650kg.

Treatment should not be repeated in less than 42 days.

Consult your veterinarian for assistance in the diagnosis, treatment and control of parasitism.

NOT TO BE USED FOR ANY PURPOSE OR IN ANY MANNER CONTRARY TO THIS LABEL UNLESS AUTHORISED UNDER APPROPRIATE LEGISLATION.

WITHHOLDING PERIOD:

MEAT: DO NOT USE less than 28 days before slaughter for human consumption.

MILK: NIL.

Bobby Calves: DO NOT SLAUGHTER for 4 days bobby calves born to cows treated during pregnancy.

TRADE ADVICE

EXPORT SLAUGHTER INTERVAL (EST): DO NOT SLAUGHTER for export for 28 days after treatment.

GENERAL INSTRUCTIONS:

Refer to administration instructions on immediate container.

Efficacy of COOPERS PARAMAX POUR-ON FOR CATTLE is not adversely affected if applied when the hide is wet or if rainfall occurs shortly after treatment. However, it is not considered good agricultural practice to treat animals if they are wet or if rain is likely.

PRECAUTIONS:

Use only in well-ventilated areas or outdoors.

Close container when not in use.

Cloudiness may result when COOPERS PARAMAX POUR-ON FOR BEEF AND DAIRY CATTLE is stored at temperatures below 0°C. Allowing to warm at room temperature will restore the normal appearance without affecting efficacy.

The antiparasitic activity of ivermectin will be impaired if the formulation is applied to areas of skin with mange scabs or lesions, or with dermatoses or adherent materials, eg. caked mud or manure.

This product is for application to skin surface only, do not give orally or parenterally.

COOPERS PARAMAX POUR-ON FOR BEEF AND DAIRY CATTLE is not recommended for use in species other than cattle.

NOTE TO USER:

The colour of COOPERS PARAMAX POUR-ON FOR BEEF AND DAIRY CATTLE may fade when exposed to light. This loss of colour does not reflect loss of potency of ivermectin. However, prolonged exposure (ie. weeks) to light can result in a gradual decline of ivermectin potency in the formulation.

Information relating to:

Safe Practice:

Correct usage:

(b) Discuss ONE ethical issue relevant to an animal production system you have studied. (4 marks)

Question 25 (8 Marks)

For a named animal pest or disease, EVALUATE an Integrated Pest Management program that is used in an animal production system you have studied.

Question 26 (12 marks)

Name a farm product

Farm Product_____

a) For the farm product named, OUTLINE ONE strategy a farmer can use to assess the quality or quantity of this product. (2 marks)

b) Describe TWO technologies used in production **and/or** marketing for the named farm product. (4 marks)

c) Discuss two named marketing options which are available to the farmer for this farm product. (6 marks)

Question 27 (8 Marks)

Name a farm product

Farm Product: _____

For the farm product named, EVALUATE TWO methods that could be used to add value to the end product.

Section II - 20 Marks

Attempt ONE question from Questions 28 – 30
Allow about 50 minutes for this section
Answer the question on the paper provided. Extra writing paper is available.

Question 28 – Agri-food, Fibre and Fuel Technologies **(20 Marks)**

(a) (i) Outline how biofuels can be produced from agriculturally produced sources. (2 marks)

(a) (ii) Describe the issues related to the production of biofuels. (6 marks)

(b) Assess the impact of gene technology applications on agricultural production (12 marks)

OR