JINJA JOINT EXAMINATIONS BOARD

MOCK EXAMINATIONS JULY/AUGUST 2024

P515/2 - PRINCIPLES AND PRACTICES OF AGRICULTURE

PROPOSED MARKING GUIDE 2024

1. (a)Describe the trend of feeding in each cattle species.

✓ The quantity of grass eaten by cattle species x gradually increases from early morning hours up to midday and gradually decrease till evening hours(6pm)

✓ The rate of feeding in cattle species Y is high in the early morning hours and gradually decrease up to mid-day after which it steadily increases in the evening hours.

Award 2 marks for 2 points

2 × 2 = 4 marks

(b) Identify of each group of cattle represented by X and Y

✓ Cattle species X is local cattle. They are able to feed more during hotter hours of the day.

✓ Cattle species Y : exotics feed more during cooler hours ie(morning and late evening

Award 2 marks for 2 points

2 × 2 = 4 marks

(c) In which ways is animal species Y adapted to feed throughout compared to X

✓ Well-developed dewlap, hump and navel fold to regulate body temperature

✓ Small body size to reduce heat absorption and easy loss of heat

✓ Short fur/ hairs for easy loss of heat

✓ Thick skin to resist sun radiations

Award 2 marks for 2 points

2 × 2 = 4 marks

(d) What is the effect of high temperature on farm cattle?

✓ Increase water intake which in turn increases cost of production

✓ Decrease milk yield as animal divert energy to regulate its body temperature.

✓ Reduction in abundance of pasture due to wilting.

✓ Loss of appetite and reduction in growth rate.

✓ Increased stress in animals and decreased productivity.

- ✓ Sweating which waste energy.
- ✓ Reduction in grazing time.

Award 1 mark for 4 points.

1 × 4 = 4 marks

(e) Explain the factors that affect the quantity of feeds eaten by cattle.

- ✓ **Age of the animal:** Young animals eat less feeds compared to mature animals.
- ✓ **Health status:** Healthy animals eat more feeds than sick animals.
- ✓ **Psychological state of the animal:** Lactating animals, pregnant animals, and fattening animals eat more quantity of food.
- ✓ Management systems used to rear animals.
- ✓ **Production potential of animals:** Highly yielding animals eat more feeds to produce the products.
- ✓ **Breed of animal:** Exotic cattle eat more than the local breed.
- ✓ **Size of the animal:** Larger animals eat a lot of feed compared to smaller animals.

Award 1 mark for 4 points.

1 × 4 = 4 marks

2(a)(i) Importance of Nitrogen in plant nutrition

- ➢ Useful in chlorophyll formation
- ➢ Encourages rapid vegetative growth
- ➢ Increase succulence in crops e.g. pineapples, water melon etc.
- ➢ Increase grain size
- ➢ Increase protein content is cereals
- ➢ Influences utilization of other nutrients e.g. potassium and phosphorus

Award 1mark for 5ponts= 5marks

(ii) Importance of phosphorus in plant nutrition

- ➢ It promotes cell division
- ➢ Encourages root growth and development
- ➢ Promotes respiration in plant cells
- ➢ Promotes flower, fruit and seed formation
- ➢ Improves vegetables quality
- ➢ Improves disease resistance in certain crops

- Encourages leaf formation and development
- Prevents lodging of crops by strengthening the straw in cereal crops

Award 1mark for 6points =6marks

(b) Ways in which the soil loses fertility

- **Leaching**, nutrients are washed to deep soil layers.
- **Soil erosion,** removes nutrients from the top soil.
- **Weeds;** These take up soil nutrients.
- **Soil capping;** Prevents entry of water and air in the soil.
- **Change in soil PH;** Unfavorable PH affects soil fertility e.g. phosphorus becomes un available at low PH.
- **Water logging;** Reduces the amount of air in the soil.
- **Soil pollution;** This kills important soil organisms.
- **Mono cropping/** mono culture; Leads to depletion of nutrients.
- **Immobilization;** This reduces nutrients.
- Vitalization, nutrients are lost in volatile form.
- **Denitrification;** Nitrates are reduced by denitrifying bacteria to gaseous form
- **Over cultivation;** encourage rapid loss of nutrients through oxidation.
- Excess drainage leads to loss of nutrients
- **Soil compaction** due to use of heavy machines leading to development of hard pans
- Plant uptake/ plant root absorption
- **Uncontrolled bush burning** that leads to volatilization and killing of organisms
- **Fixation of nutrients;** Some nutrients are in insoluble compounds which are not accessible by plants.

Award 1½ mark for 6points= 9marks

½ mark for mentioning the point

1mark for explanation

3(a) Selectivity of herbicide **refers to the capacity of a herbicide to be able to kill a given species of weed and not another plant.**

Award 2marks for 1 definition =2marks

(b) Factors that contributes to the selectivity of herbicides.

- **Stage of growth of the plant;** Young plants are more susceptible to herbicides action because of their higher growth activity.
- Method of application where by high selectivity is attained by placing the herbicide where the weed is and away from the crop.
- Plant morphology and anatomy e.g. leaf angle, nature of leaf surface.
- Herbicides characteristics; Herbicides which interfere with photosynthesis are non-selective.
- **Concentration;** Under high concentration, herbicides kill all kinds of plants.
- Formulation; Oil formations are more toxic to plants.
- Physiological/ metabolic factors; beans have a poor rate of translation of 2;4-D while maize is able to neutralize the toxic levels of 2,4-D to less toxic 2,4-B.

Award 2marks for 6points =12marks

1mark for mention

1mark for explanation

(c) Reasons why most farmers prefer chemical weed control

- They are highly effective as total weed killers
- Herbicides do not disturb the soil structure
- Can be used to control weeds in closely spaced crops like millet
- Convenient where topography hinders mechanical cultivation.
- Labour required for weed control is greatly minimized.
- Roots of crops are not disturbed.
- Trans located, herbicides are more effective against perennial rhizomatic weeds
- Convenient where crop morphology makes hard weeding makes hard weeding unpleasant e.g. in sisals and sugar cane plantation.
- Time saving as a large area of land can be effectively covered in a short time.

Award 1mark for 6points =6marks

4(a)Fish sampling refers to the removal of fish from the pond to assess their growth and health status after which they are returned in the pond, café or tank.

(b) Factors that influence the stocking rate of fish in a fish pond.

- **Purpose of the fish kept,** those for feeding other animals may be overstocked than those required for market condition.
- **Amount of capital available**; Large fish ponds require a lot of capital to buy feeds.
- **Size of the pond,** the bigger the pond, the more amount it can accommodate
- **Type/ species of fish,** some species require more space than others
- **Growth stage, bigger and larger fish require more space than** smaller/ young fish.
- Level of management of the pond such as fertilizer application, supplementary feeding etc.
- Amount of natural and supplementary feeds available.
- Fertility of the pond and its ability to provide natural pond supply.
- The rate of reproduction e.g. low stocking rate is recommended with species which multiply fast.

Award 2marks for points =12marks

1mark for mention

1mark for explanation

(c) Control measures of fish predators in a fish pond.

- Using biological agents that have no preference for fish.
- Clearing the vegetable near the fish pond to keep off toads and snakes.
- Fencing off the pond with wire mesh to keep off predatory reptiles and mammals.
- Providing a strong net to cover top of the pond to keep off predatory birds.
- Using scare crows against predatory birds.
- Draining the pond to remove predatory amphibians at the pond bottom.
- Trapping, beating and shooting.
- Bathing and poisoning.
- Providing a wire mesh at the water inlet to trap predatory toads and snakes.

Award 1mark for 6ponits =6marks

5(a) Reasons why piggery is gaining popularity among Ugandan farmers.

- Have faster growth rate.
- Have a short gestation period.
- Gives quick returns.
- Have a high feed conversion ratio.
- Simple structure can be used.
- Provide high quality meat.
- Have low initial capital requirement.
- Make use of kitchen refuse/ left over.
- They provide manure.
- Produce many young ones.
- They can be kept on a small piece of land.
- Feed on a variety of food stuff.
- Pigs and pig product have ready market.
- They mature early/ reach slaughter weight early.

Award 1mark for 8points =8marks

(b) Management practices that should be carried out on piglets from farrowing to weaning.

- Removing mucus from nostrils to breath properly.
- Dry the piglets using dry grass.
- Count the piglets to establish litter size and number.
- Weigh the piglets to know the litter weight.
- Allow piglets to start suckling.
- Smear piglets with cresol disinfectant to remove bad smell from piglets.
- Separate the piglets from the sow and put them into a creep area to avoid sow from lying on them.
- Feed piglets on creep feeds from day 7 for proper growth.
- Provide clean drinking water.
- Give identification marks to the piglets for easy record keeping.
- Inject piglets with iron to control anemia or smear sow teats with anti-hill soil.
- Provide a source of heat to keep piglets warm.
- Clean and disinfect the creep feed area to control diseases.

- Give soft fodder to piglets to supplement the concentrates.
- provide dry grass as beddings.
- Deworm piglets to control diseases.
- Vaccinate piglets to control diseases.
- Treatment should be carried out in case of disease outbreak.
- Allow piglets to do exercise.
- Castrate male piglets.
- Keep pen clean to avoid disease outbreak.
- Regular washing/ dusting to control external parasites.
- Keep piglet records up to weaning stage.
- Wean piglets at about 5kg average weight.

Award 1½ mark for 8points=12marks

6(a) Materials that are required for roofing farm structure are;

- Nails to tightly join timber and iron sheets.
- Iron sheet to keep off rain.
- Gutter to trap the rain water and direct it appropriately.
- Hooking metal for attachment of wall plate.
- Timber to make the roof truss.
- Riojes to close/ join the top apex

Award 1mark for 5points =5marks

(b) Factors considered when selecting timber materials for roofing.

- **Cost of timber,** should be affordable and within farmers financial status.
- Availability of timber where a buyer can access.
- **Level of security required,** strong timbers are needed for high level security.
- **Farmers preference,** farmer may choose timber he or she likes most.
- **Durability of timber;** should be able to hold the roof for a longer period of time
- Availability of skilled labour for effective installation of the roof.
- Straightness of timber for straight roof truss.
- Type of building to be enclosed may require different of timber to take in wood preservation.

Award 2marks for 6points =12marks

1 mark for mention and 1 mark for explanation.

(c) Uses of a roof on a farm structure

- Give beauty and value to a farm building.
- Encloses the top part of the wall.
- Regulate temperature of the building.
- Protect animals and produce against bad weather.

Award 1mark for 3points =3marks

7(a) Features of a good spray race

- Concrete rough floor to reduce contamination.
- A leak proof roof to trap the splashing spray.
- Collecting yard for assembling animals from grazing
- Parallel walls that trap the splashing spray.
- sump/ reservoir to store the spray wash
- Pipe with nozzles to distribute the spray wash.
- Fitters on the nozzles to prevent blockage of the nozzles
- Entrance race to arrange animals in a single file.
- Drainage race where the spray trips off from the body of the animals.
- Foot bath to clean the hooves of animals

Award 1 mark for 9 points= 9marks

(b) **Advantages of using a spray race in tick control**

- Requires less labour to operate
- Sick/ pregnant animals can be sprayed
- No accidents like in a dip tank
- Quick / saves time
- A large number of animals can be handled in one day
- It is relatively cheaper to set up than a cattle dip.
- Suitable for calves/ small animals
- Fresh acaricides is used daily at the correct concentration

A ward 1 mark for 6 points =06 marks

(c) How a spray race is maintained ?

- Repair/ replace leaking pipes

- Un block the nozzles
- Service the pump regularly
- Regular cleaning of the sump after spraying
- Unblock the return pipe to the sump
- Ensure that there is a reliable source of power/ generator
- Replace/ repair broken rails/ poles on the race.
- Remove dirty water from the fast bath and put clean water
- Use clean water regularly when mixing acaricides

A ward 1 mark for 5 points = 05 marks

8(a) (i) **Opportunity cost** refers to the valve of the second best alternative forgone when choice is made.

A ward 2 mark =02 marks

(ii). **Effects of opportunity cost in agricultural production.**

- Choice made due to market needs and price can bring about food insecurity
- It leads to over production especially where many farmers take up the same enterprise
- Limited products due to bad conditions can lead to less capital accumulation
- Utilization of scarce resources can occur leading to diminishing marginal returns
- Great losses or no production due to adverse conditions such as disease out break

A ward 1 mark for 4 points =04 marks

(b) **Ways of reducing risks in farming**

- Building owner equity / personal saving to counteract any failure
- Input rationing
- Adopting modern farming methods
- Choosing reliable enterprises
- Liquidity ie maintain assets that can be easily be converted to cash
- Diversification
- Insurance
- Flexibility
- Ability to get a loan

A ward $1^1/_2$ mark for 6 points =09 marks

(c) **Benefits of diversification**

- There is efficient use of labour throughout the year
- There is better utilization of soil nutrients

e income throughout the year from crops and livestock products
n of land throughout the year
an be used in crop production for the case if mixes farming
rom the sale of a variety of products.
ity from the different farm enterprises
increasing employment opportunities
materials to agro- based industries
the economy when by products become useful in other industries
tainties on the farm which is created by fluctuations in prices.
cts to the population for consumption
Award 1 mark for 5 points =05 marks

efers to the rapid increase in number of people in an area
rd 2 marks for correct definition =02 marks
ulation explosion in Uganda today.
y with in the country enable people to find comfort and produce

ureas result into early marriages of girls as a way of getting

te which has promoted food production to support the growing

of women in Uganda which is at 6 children for women
are services that have reduced death rates and child mortality
cation of people resulting into reduced use of contraceptives and
methods
omen in polygamous marriage to be favored by their husbands.
neighbouring countries and lead to many refugees seeking for

l for settlement
igration which can not prevent influx of other people coming

ward $1^1/_2$ mark for 8 points =12 marks
be taken to mitigate population increase in Uganda.

- Use of family planning services to reduce on the number of children born as well as spacing birth
- Encouraging public awareness through educating and sensitizing people on the dangers of high population.
- Giving incentives and free services to people with few children to limit birth rates
- Discouraging cultural and religious practices like polygamy, contract marriages that rapidly increase population
- Providing cheap contraceptives to people reduce necessary conception and birth
- Promoting the girl child education in order to reduce early marriages of girls
- Formulation of legislation and proper implementation/ enforcement to limit the number of children per family

Award 1 mark for 6 points =06 marks

END