**JINJA JOINT EXAMINATION BOARD**

**MOCK EXMINATIONS 2019**

527/1 AGRICULTURE

MARKING GUIDE

**PART A: (20marks)**

***Answer all questions in this part.***

***For question 1, write the letter corresponding to the best answer in the box provided***

***For questions 2 to 5, write all answers in the space provided.***

1(a) Which of the following factors will not influence the farmer’s decision on what to produce

1. current market demand
2. opportunity cost D
3. tastes and preferences of buyers
4. the law of diminishing returns

(b) Seedlings are transplanted during evening in order to

1. minimize water loss from the plant
2. allow seedlings to make enough food before transplanting D
3. allow roots absorb enough water before transplanting’
4. allow seedlings to adjust to new conditions at night

(c) Which of the following features of a farm tractor enables the operator to turn the tractor in a narrow space during ploughing

1. small front wheels
2. the differential B
3. hydraulic power steering
4. braking of rear wheel

(d) The process by which nitrogen is lost to the atmosphere in gaseous form is known as

1. immobilization
2. mineralization
3. hydration D
4. volatilization

***(02marks)***

2. Explain four precautions that should be taken when storing grains.

* Store dried grains.
* Ensure proper ventilation of the store.
* Store the grains in a clean store.
* Avoid mixing new stock with old produce to avoid cross infection.
* Put produce in clean bags to avoid contamination.
* Keep the grains on a raised platform to reduce dampness.
* Store the grains in a leak proof roofs to reduce rotting and germination of seeds.

3. State a possible cause of each of the following faults in an engine.

**i) Engine stops suddenly**

* No fuel
* Faulty ignition coil.
* Faulty spark plugs.
* Fuel line is blocked.
* Too much load on the engine
* Overheating.

ii) **Engine does not start.**

* Loose wiring connections
* Loose battery terminals/ dirty terminals
* Starter motor worn out.
* No fuel in the tank
* Faulty distributor
* Faulty ignition coil
* Faulty fuel pump.
* Faulty carburetor
* Faulty injector pump.
* Dirty / old spark plug.

iii) Engine overheats.

* Over speeding or excessive load
* Lack of adequate water in the radiator
* Too weak a fuel mixture
* Loose fan belt
* Little or no oil in the engine dirty radiator

b) Suggest an action to be taken to correct each of the following engine faults.

1).Engine jerking

* Replace injectors/ clean carburetor
* Change filters/clean the sediment bowl
* Bleed the fuel lines
* Re-adjust the carburetor
* Add more fuel
* Replace/repair injector pump
* Select the right gear for the speed or load
* Clean the spark plug/replace old spark plugs

ii) Engine producing black smoke.

* Service the air cleaner
* Replace injectors/carburetor
* Replace engine oil/put required amount of oil in the engine
* Replace piston/carburetor
* Replace old spark plugs
* Use correct oil grade
* Correct setting of the carburetor

4. a) Give reasons for feeding pigs on fresh pastures

- pastures provide the bulk that is necessary to satisfy the appetite.

- the roughage provided by the pastures help in peristalsis and in the movement of faeces through the

gut

- The pastures help to compliment the feeds got by the pigs from other sources.

- It saves the farmer some money since the pastures are cheaper than the commercial feeds

- The roughage provided by the fresh pastures help to hold the faecal mass moist and ease its passage

through the gut and controls constipation in the process.

5 a) What is land fragmentation?

* This is a situation where a farmer owns a number of small plots of land that are scattered in different places.

b) Outline three conditions that encourage land fragmentation.

* Increasing human population pressure on limited land resources.
* Customary inheritance.
* Polygamy
* Government allocation of land to settlers in a new area.
* Poverty where farmers lack money to buy large chucks of land.
* Accumulation of land as in the case of farmers with limited capital who wish to increase their land holdings, purchasing small pieces of land in different places at different times.

**PART B**

Qn 6(a) Benefits of circulating engine oil in a tractor.

* It reduces the rate of wear and tear of the moving parts by reducing fraction.
* Reduces the heat created
* Oil acts as a seal between
* Acts as a cleaning agent by washing soot and metal chopping from the oil ways to the sump.
* Prevents rusting by coating the materials and reducing their reaction with atmospheric gases
* Acts as a coolant by carrying away some of the engine.
* Reduces fraction by creating a firm between two sliding surfaces
* Absorbs the noise created by the engine.
* Acts as a shock absorber that would occur in the bearing.

**I mark each for 8 explained points 1X 8=08**

6(b) Ensuring that the lubrication system of a tractor functions efficiently

* Applying the proper grand of oil
* Replace oil filters when you change the engine oil
* Replace used oil regularly
* Contaminated or reused oil should not be reused
* Drain out the oil when it is still hot, it flows smoothing and avoids sticking to the engine parts
* Check the level of oil regularly using a dip stick and the oil to the required level
* Seal off any leakages in the system to prevent loss of engine oil
* Clean the crankcase breather according to the manufacturer’s instructions

**1 mark each for 8 correct point 1x8 = 08marks.**

6(c) Causes of contamination of lubrication

* UN burnt fuel, which gets past the piston and mixes with the oil due to incomplete combustion
* Water produced when fuel is burnt
* Dust and dirt which corers from the air
* Proven metallic particles that are a result of wear and tear in the engine
* Rusty particles that fall off from rusty engine pars and remain in the oil
* Water acids and alcohol (sludge) produced as a result of combustion
* Dirty oil filters
* Excessive heat

**1 mark each for 4 correct answers**

1x4 = 04 marks

Total = 08 +08+04 = 20marks

7(a) Types of records kept by any farm business

* Crop records

Showing items such as type and quantity of crops grown, yield , agronomic practices etc

* Production records

e.g number of livestock kept, amount of milk, beef, eggs produced etc

* Calving records showing date of calving weight of the calf , condition of the calf etc
* Health records showing disease incidence, treatment given, etc
* Breeding records to show items like parentage date of service, breed, sire, dam, etc.
* Records on farm history
* Feeding records to show the amount of records given per day , type of fedds etc.
* Expenditure records on the inputs
* Income records

Showing the money received from the sales farm produced

* Balance sheets

Showing the financial status of the farm at a particular date.

* Trading account / profit and loss account showing income and expenses incurred on the farm during a stated period of time, usually one year
* Operational records
* Labour records showing the amount and cost of labour used

**1 mark each for 10 point** 1x10 = 10

7(b) Importance of keeping good far records.

* Help the farmer in planning and making decision
* Enables the farm to know if he/she is making profits or losses
* Help farmer to obtain loans
* Help the farmer to improve by showing the areas of weakness
* Enable the farmer to remember his debts and pay them
* Enable the farmer’s taxes to be assessed correctly
* In cooperate farming, records help in showing profits and losses
* Act as incentives to the farmer as they show his progress.
* Show the history of the farm and its development.
* Helps in valuing the farm in case of sale.
* Health records enable the farmer to control diseases
* Records show the farmer’s income and expenditure.
* Help in breeding by showing an animal lineage / parentage
* Show whether farm plans are being operated correctly.
* Used in calculating the efficiency of farmer
* Are legal requirements in some countries?
* Helps in setting the estate in case of death
* Helps the farmer in making insurance claims.

**1 mark each far 10 points 1x10 = 10**

**Total = 10+10 = 20 marks**

8(a) Importance of farm structures in agricultural production

* They provide comfort to humans and animals
* They protect from harsh weather and thieves.
* Farm structure e.g poultry house protects vulnerable livestock e.g poultry against harsh weather and predators.
* Some farm structure e.g building increase efficiency and ease of management by acting as office.
* Some serve a sanitary function i.e bathrooms and toilets.
* Crop store increase the profit margin by storing crops to wait for higher prices.
* Farm structures increase the real estate value of the farm.
* Help in the conservation of labour e.g when a maize crib is installed in doors.
* They reduce crop losses by storing excess produce to reduce wastage.
* May increase the quality of produce through storage of grains like maize and millet and processing
* Farm structure assists the farmer in handling animals during operations like pest and disease control, mulching vaccine etc e.g crush, spray race and cattle dip

**I mark each for 8 correct point 1X8 marks.**

8(b) qualities of a good animal house

* It must be strong enough in the walls to protect the animals from wild animals and thieves.
* It should be in a dry and well drained site to reduce pest and disease incidence.
* It should have a hard impervious floor that slopes to one end to enable adequate drainage of liquid manure.
* The walls should be strong and high enough to keep the animals in
* It should have wind proof wall on the side from which the wind usually blows.
* It should have a strong roof to keep off rain and sun.
* It should have a large space between the tops of the wall and the roof for good ventilation, adequate light and for the animals to look out.
* It should have a water trough and feed trough.
* Should be near an adjacent dung heap down slop and down wind of the animal house to ease disposal of the manure.
* It should make economical use of local construction materials available
* The floor should be rough finished to avoid slipping by the animals
* Calf pens should be warm

**I mark each for 8 points.** marks 1X8= 08

8(c) Gives four examples of building materials.

* Wood
* Concrete
* Metal
* Stones
* Blocks
* Bricks
* Earth
* Bamboo
* Thatch
* Mortar

**I mark each for 4 correct examples**

**1X4=04marks**

**total =08+08+04=20marks.**

9. a) Outline the qualities of a good fertilizer.

* It should be easy to apply
* It should be easy to handle.
* It should supply the required nutrients readily to the soil.
* It should be affordable.
* It should have long lasting effect in the soil.
* It should be easy to store.
* It should have high nutrient content.

b) **Describe the factors that affect the response of crops to fertilizer application.**

* Type of fertilizer applied; if the fertilizer that contains the limiting nutrient is applied, response is better.
* Age of plant/ stage of application;different nutrients are required at different stages of growth.
* Amount of water in the soil; too little or too much water hinder the proper response of the crop to fertilizer.
* Healthy of the plant; healthy plants respond better to crops than infected ones.
* Amount of fertilizer applied; too much or too little fertilizer gives less response than the expected response, Optimum amounts give the best results.
* Agronomic practices carried out practices such as weeding, mulching and pruning increase the response of crops to fertilizers.
* Type of the crop; Certain crops need larger amounts of particular nutrients than others forexample legumes and cereals.
* Point of placement; If fertilizers are placed near the plant then the response will be better than when the fertilizer is placed far away from the crop.
* Fertility level of the soil; Crops responds to fertilizer higher in less fertile soils.
* Plant population; Response is best with optimum plant population.
* Weed infestation; Weeds will reduce response due to competition.

**10.(a) factors that influence crop distribution**

**- climate**

Rainfall and temperature are two aspects of climate responsible for cropdistribution

Some crops need low temperature others need moderate temperature

Some crops also need high rainfall and others need moderate rainfall

* **Soil condition**

Soil type, soil fertility, soil PH and soil depth

All the above influence crop distribution. For example some crops need deep- fertile soils while others my grow in sandy soils

* **Pastes and diseases**

Warm tropical areas have many pastes and diseases so farmers have to do regular spraying

* **Topography**

Higher altitudes are cool and favour certain crops eg. iris potatoes and Arabica coffee and low altitudes are warm.

* **Market**

Some crops such as vegetables are grown near urban areas where there is ready market

* **Price**

This influences the choice of crops grown. Farmers will always rush to grow crops with high price.

* **Transport and communication**

Bulky crop products require easy accessibility to market

* **Storage facilities**

Ease of storage ,makes the crops popular eg cereals

* **Availability of capital**

Land, money, machinery will influence the choice of crop to grow

* **Customary attitudes**

Most tribes are associated with traditional crops eg. Bantu- matooke, Luo and Iteso- millet, cassava and G-nuts

**b) Practices that a farmer should carry out to ensure uniform germination of seeds**

- select seeds of the same size, variety age and free from pastes and diseases

- plant the seeds at the same time

- prepare the whole field to the required uniform tilth

- plant at the right moisture content of the soil and irrigate uniformly

- treat against soil borne pastes and diseases

- plant at the correct depth

**11 a) Explain the factors that influence crop distribution.**

**b) State the practices that a farmer should carry out to ensure uniform germination of seeds.**

**11. a) What role does vegetation play in soil and water conservation.**

* It reduces the impact of rain drops on the soil.
* It reduces the speed of wind and so reduces erosion by wind.
* The plant roots also have binding effect on the soil particles and so make them harder to erode.
* It keeps the soil moist and heavy by reducing evaporation and so reduces wind erosion.
* The plants add organic matter to the soil and this has a binding effect on the soil particles.
* Some plants have strong roots which penetrate deeper into the soil and open up it increasing the entry of water into the soil and reducing surface run off.
* It increases surface roughness and so reduces the speed of run off and its erosive energy.
* Legume vegetation fix nitrogen into the soil thus maintaining soil fertility.
* They form shading effects which reduce surface evaporation thus conserve water below to the surface layers.

Dead foliage cover the ground and act as mulch.

* Vegetation aids in water and nutrient recycling.

**2marks each for 7 explained points.**

**2x7=14**

b) **State the characteristics of soils suitable for healthy plant growth.**

* It should have a high nutrient content, ie the soil should be fertile.
* It should have moderate water holding capacity , this enables the soil to retain only water enough for crop growth.
* It should have good aeration.
* It should have a favorable PH.
* It should have high organic matter content.
* It should have good drainage.
* It should have a good texture.
* The soils should be deep.
* It should contain beneficial microorganisms.

**1mark each for 6 stated points**

**1x6=06 marks**

**14+06=20marks**

12. State the differences between ruminants and non -ruminants.

|  |  |
| --- | --- |
| Ruminants | Non Ruminants |
| They chew the cud | Do not chew the cud |
| Have four stomach compartments (Polygastric) | Have one stomach compartment. (Monogastric |
| Most digestion and absorption occurs in the rumen | Digestion and absorption takes place in the small intestine. |
| Have no ptyalin in saliva | Have Ptyalin in saliva |
| Digest cellulose easily | Cannot digest cellulose |
| Fermentation is possible due to the presence of the rumen microbes. | Fermentation not possible due to lack of a rumen and rumen microbes. |
| They depend on volatile fatty acids for energy. | They depend on glucose for energy. |
| They have small ceaca because they already have microbes in the rumen. | They have large ceaca that hold some bacteria to assist in digestion |

b) How can a farmer ensure that feeds are efficiently utilized by animals on the farm.

- By giving the right amount of feeds to animals.

- By Giving the animals the right types of feeds.

- by providing enough water to go with feeds.

- By Feeding the animals at the right time.

- By presenting the feeds in the right form.

- By providing feeds in clean containers.

- By providing pastures at the right stage of growth.

- By providing feeds in palatable form to animals.

- By providing the right combination of feeds/ additives.

- By providing adequate feeding space/ containers

- By Controlling diseases and parasites to keep animals healthy.

- By providing feeds free from anti- metabolites like trypsin inhibitors in beans and soya beans when raw which prevents digestion.

13(a). **Outline the conditions necessary for proper hatching of eggs.**

* Temperature of 32.20c to 380c.
* Humidity of 60% for the first 18 days and then 70% later.
* Turning of eggs.
* Eggs must be fertile.
* Eggs must no have any defect
* Eggs must be of normal size.
* Proper ventilation.

**b) Describe the abnormalites that may occur in eggs during their formation.**

**-Meat spots:** this is formed when a piece of tissue tears from the ovary at the time of ovulation and it may come down with yolk.

**-** Double yolks: this is due to physiological defect in the oviduct/ ovary releasing two ova at the same time.

**-** Thin shells; may be due to disease or nutritional deficiency of vitamin A, or calcium or phosphorous.

**-**Deformed eggs: these eggs do not have the normal oval shape due to a defect in the isthmus where the oval shape is determined.

**-**Soft-shelled eggs: this may be due to immature laying of the egg.

**-**Shell less egg: this may be due to the defect in the uterus or failure of the shell gland to deposit caliciferous shell around the egg.

**-** Blood spots; this may be a result of a drop of blood added to the egg yolk as ovulation occurs

**-**Rough surfaced eggs: it is due to un even deposition of the egg shell.

**-** Dwarf eggs; these are eggs with no yolk and are a result of some irritant, which stimulates the oviduct where it sets up production f white of white around it and later membranes and shells.

**-**Egg with in egg . This occurs when an un abnormally small egg is formed first and for some un known reason starts moving up the oviduct instead of passing out in the normal way, when it meets the yolk passing down, it joins this and a new layer of white and eventually a new shell is formed around both.

**c) State the measures a farmer would take in order to produce high quality eggs.**

-Feed birds with good quality feeds that will not impart bad smell into the eggs.

-Give the birds a balanced to provide necessary nutrients for the formation of eggs.

-Provide clean nesting boxes regularly to avoid the soling the eggs.

- Gather eggs from the nesting boxes regularly to avid the eggs getting dirty and breaking.

- Grade the eggs according to size

-Store the eggs in egg trays with broad end of he egg facing upwards to allow air circulation.

- Keep eggs in cool place to prevent detoriation of egg quality.

**14 (a) Suggest and explain the factors that influence the yield and composition of milk in a dairy cow?**

The breed of the animal; Exotic animals tend to produce more milk than indigenous cows but with less butter fat.

Feeds; The amount and composition of milk depends on the type of feeds given to the animal.

Age of the cow; Milk yield tend to increase with age of the animal upto the seventh or eighth lactation; Old animals produce less butter fat content than the younger ones.

Stage of lactation; The yield of a cow increases until the sixth to seventh week after parturition and it then gradually decreases until the animal dries off.

Health of the animal. Both maximum yield and high quality milk can only be achieved when animals are healthy. Diseases affect both total production and quality of milk.

Period or season of the year; During the rain, cows produce more milk of lower quality than in the dry season when the cows also eat less and milk yield decreases.

Exercise; The more exercise the animal is inflicted upon, the less butter fat content.

Frequency of milking; The shorter the milking interval, the less the butter fat content.

Water supply; milk is largely made of water so good milking animals need a lot of water to supply more milk.

Use of drugs; Some traces of drugs may change the composition of milk.

Excitement; Nervous animals produce milk of varying composition in terms of butterfat content.

Temperature; High temperatures are known to reduce milk yields.

Animal handling during milking: gentle handling of the animal during milking ensures high yields.

Temperament of the cow; Quiet animals are the best milkier, nervous cows give less milk and they produce milk of varying butter fat content.

Stage of pregnancy; Changes in hormonal pattern in a pregnant animal affect milk composition by increasing solid not fat.

b) **Explain the causes of un pleasant flavours in milk.**

* **The animals skin** especially if the animal has been wallowing in dirty, muddy water or dung.
* **The environment around the milking barn;** the milk may absorb the flavours inherent in its environment.
* **Diseases:** Cows with mastitis produce milk which is salty to taste.
* **Feeds consumed by the animal;** some feeds have strong flavours that may be felt even in the animal products for example onions.
* **Bacterial contamination of the milk;** thisresults in the production of an acid taste in the milk.
* **The utensils in which the milk has been stored;**  if these have any strange flavor, then they will pass the flavor onto the milk.
* **Accidental addition of urine, medicants paraffin to the milk;** this introduces the odours and tastes associated with those materials to the milk.