527/1 AGRICULTURE

1. D
2. C
3. D
4. C

2. State five reasons for processing agricultural produce.

- It prolongs the useful life of a commodity
- It eases utilization e.g grinding maize into flour
- Reduces fluctuation in prices of goods
- Helps to destroy toxins in products
- Reduces wastage due to spoilage
- Adds value of products
- More products are got from a single products
- Reduce bulkiness and ease transportation

  Accept 5 points @ 1mk 5x 1 = 5 marks

3. Mention four advantages of using animal power in farm operations.

- Animal power can be used in fragmented land
- It requires low initial costs/ low maintenance costs.
- Animal drawn equipment are locally available
- Can be used in hilly area.
- Less skilled labour
- Faster than human power
- Cheaper than human power for large acrages.
- It is multipurpose.

  Accept 4 points @ 1 mark 4x1 = 4

4. State four reasons why fodder is conserved

- Conserved fodder can be sold for income
- Avoid wastage of forage
- To provide feed for dry seasons
- Distribute the available forage for the stock throughout the year.
- Reserve funds that would be used to purchase animal feeds
- To maintain stocking rate
- Provide roughage to animal even if they are fed on concentrates.

  Accept any 4 points @ 1 mark (4x1) = 4 marks

5. (a) Name four inorganic fertilizer that contain nitrogen.

NPK (Nitrogen phosphorous, potassium)
CAN (Calcium Ammonium Nitrate)
KNO_3 (potassium nitrate)
$(NH_4)_2SO_4$ (Sulphate of ammonia)
NH_2CONH_2 (Urea)
DAP Diammonium Phosphate
NH_4NO_3 Ammonium Nitrate

Accept any four points for ½ @ ½ x 4 = 2 marks

b) A farmer wishes to apply 300kg of nitrogen to his field. How many 50kg bags of ammonium Nitrate would he buy

Ammonium nitrate contains 32% N

32kg N $\longrightarrow$ 100kg NH_4NO_3

1 kg N $\longrightarrow \frac{100}{32}$

300kg N $\longrightarrow \frac{100}{32}$ x 300 = 937.5kg of NH_4NO_3

But 50 kg $\longrightarrow$ 1 bag of NH_4NO_3

1 kg $\longrightarrow \frac{1}{50}$

937.5 kg $\frac{1}{50}$ x 937.5 bags = 18.75 bags of NH_4NO_3 3 marks

Total = 20 marks

SECTION B

PART 1 (MECHANISATION AND FARM MANAGEMENT

6. (a) Methods of increasing the wheel grip of a tractor.

Tyre grip is the ability of a tyre to be firm/stable on the ground when running

- Reducing the pressure in the tyres
- Using metallic wheels but this is not recommended on public roads.
- Addition of weight that is either in front of the tractor or behind on the wheels, thee help to increase stability as the tractor moves thus increasing grip
- Increasing the number of rear tyres if possible or adding more wheels, particularly on rear axles.
- Ballasting the tyres, water can be added to the inner tubes of the tyres by either machines pumping or gravity. Award 1 ½ marks for the point for any four points
- Using large tyres to increase surface area
- Retrenching the tyres

- Use of four wheel drive.

(6 marks)

b) How a tractor operator ensures that the tractor is in good working condition before the day's work.
The operator should ensure that parts of the tractor given below are checked and are in good condition the parts include:
Fuel; there should be plenty of fuel in the fuel tank
Oil; the level of oil should be at the recommended level
Battery; it should contain electrolyte at the required level if it is below add distilled water.
Check the breaking system efficiency before the day's work
Terminals should be cleaned if corroded and apply grease
Radiator; there should be enough water if low add more
Nipples; apply grease with grease gun
Air cleaner; Add oil to the required level oil type
Remove dirty oil
Clean bowl and clean oil
Nuts and bolts; tighten them if they are loose
Fan belt; check its tension and correct if necessary
Tyres; check the pressure if low it must be pumped up
Sediment bowl; remove any large sediments from the bowl
Award 1 mk for 9 points = 9 marks

c) Limitations of using a tractor

- High cost of tractors such that only few people can afford them
- High cost of tractor maintainace in view of spare parts
- High cost of fuel
- Lack of skilled labour to operate and maintain the tractor
- Topography of land (in some parts too hilly or swampy)
- Lack of enough capital to buy more tractors and spare parts.
- High wire charges for the few tractors available
- Thick/dense vegetation that hinder use of tractors
- Tenure system and land fragmentation resulting in small land holding
- Inefficiency and corruption in tractor hire services.

7. (a) Suggest what financial institutions must do to ensure that farmers use credit properly

- Provide extension service to farmers to show/educate them how to use loans,
- Increase / improve supervision of loans by visiting the farmers regulary.

- Improve on staff training for effective coordination with farmers.
- Provide farmers with inputs at fair prices
- Organize marketing of farmers produce at fair prices.
- Provide farmers with loans in kind
- Give loans to farmers in time / at correct time
- Give adequate reasonable grace period to pay the loan/soft loan.
- Charge fair interest rates / soft loan.
- Should help farmers to identify viable projects
- Help farmers to choose projects they can handle/manage. (8marks)

b) Explain how farmers should guard against risks and uncertainties to ensure profitable production

- Diversify farm activities set up several enterprises to avoid total loss
- Select more certain enterprises to increase chances of success.
- Carry out contract farming, to ensure ready market.
- Carry out insurance to guarantee compensation in the event of a loss.
- Input rationing to avoid total loss
- Flexibility in production methods to be able to switch off from one enterprise to another with minimal costs
- Adopt modern methods of production to improve quality /quantity of produce.
- Build owner equity/ saving to improve credit worthiness
- Liquidity of the farms assets to allow easy off set of a loss.
- Proper storage facilities to maintain quality and sell when prices are high.

  6 points @ 2 marks 6 x 2 = 12 marks

PART B (SECTION B)

8. **(a) Why is fencing important on a farm** **(12 marks)**

- Enables mixed farming to be carried on
- Enables rotational grazing to be done
- Enables night paddocking/ differed grazing to be done
- Controls the spread of diseases from outside intruding animals
- Isolation of sick animals/ pregnant
- Safe guard animals from destroying peoples crops
- Grouping of animals according to age
- Isolates watering points.
- Reduces labour requirements
- Live fences act as wind breaks
- Controls parasites especially ticks and some internal parasites

- Adds value to the farm.
- Enables controlled mating to be carried out
- Seals off dangerous points to avoid accidents
- Prevents intruders

  Accept and 12 points @ 1 mark 12 x 1 12 marks

b) Describe how a hedge fence is established on a farm (8 marks)

- Clear the area of along the boundary where to plant the hedge
- Plough deeply removing all weeds
- Use a string to determine the straightness of a hedge
- Make deep holes along the strings
- Remove the seedling from the porting material
- Plant the seedling and firm it with soil
- Water the seedlings
- Top up with manure along the hedge.

  Award 8points for 1 mark @ point chronologically arranged total 20 marks

SECTION II PART 2 CROP PRODUCTION

9. (a) State the different forms of soil structure (4 marks)

- Blocky structure/cuboidal
- Prismatic structure
- Platy structure
- Granular/crumb structure
- Columnar

  Any 4 points @ I mark 4x1 = 4 points

b) (i) Give the importance of soil structure (6 marks)

- Facilitates good drainage avoiding water logging
- It controls the ability of roots to penetrate deep into soil
- Controls soil temperature through its control of aeration.
- Ensure good balance between soil water and air.
- Ensure enough retainsion of water for plant use
- Ease work ability
- Eliminates buildup of CO_2 in the soil to toxic levels through proper aeration
- It determines the ease with which the soil can be eroded and leached

  Any six points 6 marks

(ii) How is soil structure lost or damaged?

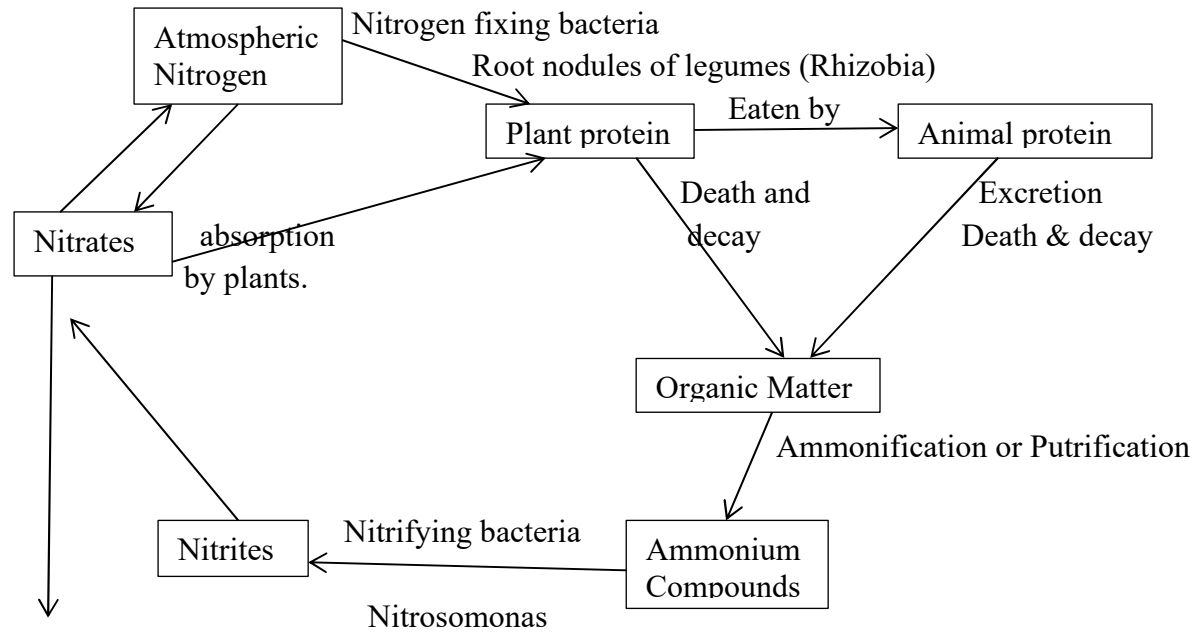
- By soil erosion
- Deep ploughing
- By deforestation
- Continous cultivation/ over cultivation
- Bush burning
- Over use of heavy tillage machines for a long time
- Over grazing/over stocking
- Ploughing in wet soils
- Mining/quarrying
  Accept 4 points @ I mark 4 x1 = 4 marks

c) In which ways can soil structure be maintained

- Cover cropping
- Addition of organic manure
- Drainage
- Mulching
- Minimum tillage
- Agroforestry and afforestation
- Bush fallowing
- Croprotation intercropping/mixed cropping
- Planting grass
- Liming

10. a) With the aid of a well labeled diagram describe the nitrogen cycle (10 marks)

THE NITROGEN CYCLE



Leaching
Immobilization

Description

- Nitrogen is fixed in root nodules of legume plants by rhizobium species bacteria to form nitrates.
- Nitrogen from the atmosphere is fixed in the soil by free living nitrogen fixing bacteria (non symbiotic fixation) to form nitrates by Azotobacter and clostridium bacteria.
- Nitrates can also be added to the soil by adding artificial fertilizers like CAN
- During lightening, Nitrogen gas from the atmosphere is converted to nitric acid that is washed into the soil as nitrates.
- Plants absorb nitrates from soil to form plant proteins.
- Animals eat plants to get animal proteins.
- When both plants and animals die and decay they form organic matter which is turned into ammonium compound through ammonification or purification.
- Ammonium compounds are changed into nitrates by purification bacteria called nitrosomonas.
- Nitrites are converted to nitrates by nitrifying bacteria called nitrobacter
- Nitrates are turned to nitrogen gas by denitrifying bacteria and through volatisation
- Nitrates can also be lost through leaching and soil erosion.

Diagram award 5 marks
Description 5 marks total 10 marks

b) What are the uses of Nitrogen in crop growth

- Necessary for chlorophyll formation
- Increase the size of grains in cereals
- Used in formation of proteins
- Controls the use or absorption of P/K
- Encourages vegetative growth/cell division
- Improves the quality of leaf crops especially vegetables
- Improves sucellency in fruits
  4 points ½ marks x 4 = 2 marks

c) Explain the methods used when applying fertilizers in crop production

- Broad casting: fertilizers are scattered on the soil surface later covered with some soil using a rake
- Band placement; fertilizers are applied between rows of crops in shallow strips/bands and covered with soil.
- Ring placement fertilisers are applied in circular from not far away the crop
- Top dressing, fertilisers are scattered on the soil surface where there is a growing crop.
- Side dressing; fertilisers are placed in a band a few centimeters on the side of the crop and covered with soil.
- Foliar application; fertilisers are mixed with water and sprayed onto the leaves and later absorbed through the stomata
- Fertigation; fertisers are mixed with irrigation water and then applied in the garden.
- Plough sole; fertisers are put in the furrow when ploughung and covered by the furrow slice.
- Drilling; fertilisers are put in planting hole with seeds
  Accept 54 points for 2 marks @ 4 x 2 = 10
  1 mark for mention
  1 mark for description
  Total 20 marks

11. a) Explain the types of damages caused by storage pests

- Eat up the produce e.g Rats, reduce weight and quantity.
- Bore holes into the seed/ reduce weight/quantity
- Reduce the viability of the seeds
- Causes bad smell/odour on produce/ reduce weight.
- Destroy/ weaken fibres of containers
- Cause discoloration/ tainting of the produced
- Lumping up of produce with webs making processing difficult.

- Loss in nutritional value of the produce
- Change in taste of the produce
- Mix up with produce thus lowering quality
  Award 7 points 1 mark @ 7 x1 = 10 marks

b) Explain the precautions that should be taken to ensure proper storage of grains crop on the farm.

- Grains should be dried to the recommended moisture content.
- The grains should be dressed with the recommended pesticide before storage
- Stores should be well constructed to ensure that;
  - They can keep dry ie rain proof
  - They are well ventilated
  - They are vermine proof
- Stores should be kept clean before grain is put in
- Crops/produce from different seasons should not be mixed during storage incase the old crops are infested with pests
  7 points @ 1 mark 7 x 1 = 7 marks

c)

- Explain the cultural practices used in pest and disease control
- Early planting: it gives the crop an early start before disease or pest attack
- Use of clean planting materials to ensure health start of the plant
- Field hygiene destruction of all plant residues and seeds in infected crops
- Use of close season/dead season
- Crop rotation
- Weed control
- Growing resistant varieties
- Use of trap plants
- Mulching

12. (a) Milk let down this is the process whereby milk is released for the alveolar cavity, where it is secreted to the udder cistern and heat canal. The release of milk is brought about by the action of oxytocin hormone which causes the alveoli cells to contract thus forcing out milk to the gland cistern. 3 marks

b) How a cow holds up its milk

- When pain or poor handling during milking occur the animal gets excited.
- a message is sent to the brain
- The pituitary gland orders adrenal gland to secrete adrenaline.
- Adrenaline is transported by blood to the udder.

- Contraction of the blood vessels hence less blood containing oxytocin reaching the udder.
- Milk is held and fails to reach the gland and teat cistern

6 points 1 mark @ 1 x6 6 marks

c) How clean milk is produced on the farm.

By cleaning the milk shed

- Healthy cows- milk cows which are free from diseases e.g. T.B, mastitis
- Washing udder- should be done before milking in order to prevent hair or dust from contaminating the milk
- Use of a strip cup to detect the presence of Mastitis.
- Cows with Mastitis should be milked last so as to avoid infecting the healthy ones and the milk poured away.
- Clip off the hair around the udder to prevent them from falling into the milk.
- Smear milking salve on teats to avoid cracking of teats while milking
- The milker should be clean and healthy to avoid transmission of diseases
- The miker should wash and dry his hands before milking to prevent contamination of milk.
- The milker should wear a cap to prevent hair dropping into the milk.
- The milker should cut his finger nails to avoid injuring the teats of the cow and contaminating milk
- The milking parlour and the surrounding should be clean to avoid contamination of the milk.
- Use of clean utensils
- Dry utensils after washing in the sun to kill germs.
- Use utensils with smooth inner walls for ease of cleaning
- Filter the milk with a strainer to remove foreign materials e.g hair, grass, utensils
- Cover milk well to prevent dust and flies falling into milk
- Store milk quickly in a cool nd clean place to avoid multiplication of micro organisms in the milk
- Remove plants with smell
- Avoid feeding sillage to cows before and during milking to prevent milk contamination
- Grooming.

11 points 1 mark @ 1 x11 = 11 marks

13. a) Problems associated with rearing of pigs in Uganda today

- Lack of good breeds for production which has led to low quality and quantity production of pig products.
- Lack of readily available market for pig products in the country
- Inadequate extension service on animal production that could advise farmers and help in treatment of sick pigs
- Inavailability of water in some areas for sanitation in piggeries and for watering the pigs
- Inadequate feeds for pigs
- Low returns from the sales of the pigs and their products
- Diseases which lead to high mortality rates in the pigs.
- General lack of transport for farmer to help in marketing process.
- General lack of drugs for hog pigs to help them in treating of diseases and worms.
- Negative attitudes or beliefs on pigs as animal especially the moslem community and tribes like the Bahima.
- Pigs as animal compete with man for the same type of food
- Poor housing system in the country.
- High temps can lead to heat stress leading to death of pigs

b) Qualities of good stock man on the farm are

- Hard working person with a high standard of personal hygiene.
- He should be kind to animals beating animals pulling their ears or torturing them in other way is a sign of bad stockmanship.
- Should have good integrity, trust worthy
- He should know the daily and monthly routine operations very well such as when to spray or dip cattle against ticks when to drench /deworm
- He should be able to recognize signs of ill health heat and signs of abortion or approaching parturition and be able to take appropriate measure in each case
- He should be able to keep up to date records on the farm e.g. records of production, breeding, accounts etc.
- Should be able to make decisions
- Be should be strong
- Should be healthy

14. (a) Define castration and give reasons for castration

Castration is the removal of testes from male animals.

Reasons for castration.

- To enable farmers to keep the best bulls for breeding and avoid in breeding in the hard

- To make animals docile and easier to handle
- Castrated bulls (steers) grow much faster than un castrated and reach market weight early
- To avoid a bad smell in meat of male animals especially he goats
- To improve on the quality of wool in sheep
- Increase feed efficiency in male animals
- To make animal more suited to work

1 mark for 10 points 1 x 10 marks

b) Describe briefly the cause of bloat and methods of its control

- Feeding animals young succulent grasses
- Feeding animals on feeds of high protein value

Control

In minor cases, the animal may recover on its own its however necessary to adopt preventive and curative measures.

Preventive measures

- Do not allow animals to eat excess of succulent gasses. It is advisable to give fairly wilted grass after cutting.
- Before allowing animals to freely graze on fresh pasture, give daily ration of hay.
- On commercial livestock farms, pastures are sprayed with vegetable oil or liquid paraffin to avoid bloat

Curative treatment

- If the bloat is mild, drench 2 – 30 ml of turpentine in half litre of milk or 0.75 litre of raw linseed oil.
- Puncture the rumen by inserting trocar and cannular through the abdorminal wall, this allows gas to escape and relieve the great pressures
- Exercise the animal by walking it around the compound this will agitate the rumen contents and help the gas to escape.

10 marks