AGRICULTURE MARKING SCHEMES

1994 – 2005 TOPICAL

Introduction to Agriculture.

1. **1996:** This is a system of farming in which one crop is grown in large scale.
2. **1997**: **Characteristics of shifting cultivation.**
   - When fertility of the soil goes down crops are not grown again until fertility is restored.
   - Plenty of land is available to the farming community
   - Practicable with annual crops not with the perennials.
   - Agricultural output from the whole system is low / subsistence production.
   - Input such as pesticides, fungicides fertilizer are rarely used / build up of pests and diseases is avoided by periodic movements to the new lands.
   - Use of simple hand tools.
3. **2001:**
   - It is a source of food for the population.
   - Earns foreign exchange for the country
   - Provides market industrial goods.
   - Farmers earn a lot of income
   - Provides employment both directly and indirectly.
4. **2002**
   - Providing market for industrial goods.
   - Providing raw materials that are used in industries.
5. **2004** **Limitations of pastoral farming**
   - Drought and aridity Diseases and parasites.
   - Diseases and parasites
   - Attack by wild animal
   - Soil erosion due to over stocking
   - Poor pastures species
   - Inadequate land/over population.
6. **2004**
   - Low production
   - Uncontrolled mating
   - Difficult to control parasites and diseases
   - Leads to overgrazing hence soil erosion.

FACTORS INFLUENCING AGRICULTURE.

1. **1995**
   - Temperature/altitude
   - Prevailing winds
   - Soil types
   - Rainfall
2. **1996:**
   - Cause physical damage / breakages to crops (accept any physical damage)
   - Causes water stress / increases rate of transpiration in crops.
   - Spread crop pests, diseases and weeds.

- Can cause stress to crops due to chilling caused by cold air.
- Cause soil erosion leading to loss of soil fertility.
- Encourage transpiration hence water and mineral uptake.

3. 1999:

- Rainfall intensity
- Rainfall reliability
- Rainfall distribution
- Rainfall amount

4. 1999:

- Poor soil fertility due to lack of manure and fertilizer application.
- Less rainfall/unreliable rainfall/too much rainfall.
- Poor soil type leading to water logging or excess leaching.
- Inappropriate pH/poor soil pH.
- Pest attack
- Poor weed control leading to competition.
- Too high or low temperature / inappropriate temperature.
- Excess wind that increase evapotranspiration/lodging of crop/floral abortion.
- Inappropriate humidity, either too high or too low.
- Extreme light intensity that may reduce photosynthesis / exhaustion of nutrients.
- Inappropriate topography that may limit crop growth.
- Hailstorm damage.

5. 2000:

- Decompose organic matter.
- Help to aerate the soil
- Atmospheric Nitrogen to nitrates.
- Upon death and decay release plant nutrients.

6. 2001

- Ploughing at the same depth season after season
- Use of heavy machinery on wet soil.

7. 2002: a)

- Physical weathering
- Biological weathering
- Chemical weathering

b)

- Soil texture is the relative proportion of the different sized particles in the soil;
- Soil structure is the genera appearance of the soil in relation to the arrangement of the individual soil particles.

c)

- Allows proper infiltration/drainage of water
- Has good aeration.
- It is not easily eroded.

8. 2003:

a)

- Light intensity.
- Light wavelength
- Light duration / photosynthesis

b)

i) Capillarity in the three different soil samples.

ii) G – Sandy soil
H – Loam soil
J – Clay soil

iii) G – Rough and coarse texture
J – Fine textured

iv) Addition of organic manure – Addition of lime

9. 2004:

a) Why soil is important to crops.

- Supports plant life anchorage.
- Provides nutrients and water
- Contains organic matter, food for micro – organism

b) Benefits of optimum soil temperature.

- Increase the rate of bio chemical reactions hence breakdown of materials to form organic matter i.e. for every 10^oC rate doubles.
- Activates soil micro – organism especially the useful bacteria for nitrogen fixation,
- Ensures maximum activities for bio chemical enzymatic reactions that bring about growth e.g. germination process.

c) Factors of soil which influence soil productivity.

- Good supply of plant nutrients and oxygen.
- Good depth
- Good drainage
- Abundance of useful soil and organism
- Adequate water retention.
- Freedom from plant pests and disease causing agents.

10. 2004

- Provide anchorage to crop roots
- Provide nutrients to crops
- Provide water to crops
- Hold air/oxygen for crop growth.

11. 2004 a)

- Good aeration is necessary for root respiration.
- Suitable for microbial activity
- Easy to work on.
- Raises soil temperature
- Removes toxic substances e.g. sodium, iron and magnesium salts.

b)

- Enhance seed germination
- Enhances plant growth.
- Enhance soil microbial activities
- Improves quality of crops e.g. Tea, pineapples.

c)

- Soil depth / drainage / aeration
- Water holding capacity
- Level of nutrients / cation exchange
- Soil pH/ Soil borne – pests and diseases.

12. 2005:

- Improves soil structure

- Reduces leading.
- Improves water holding capacity
- Increase cation exchange capacity
- Improve nutrient status upon decomposition
- Moderate soil temperature. Butter the soil pH.

FARM TOOLS AND EQUIPMENT

1. **1995:** i) – Riveting / flattening metal sheets / driving cold chisel
ii) – Breaking / crushing hardcore / big stones
- Driving wedges into wood.

2. **1996**

- N I – pipe wrench
- N II – Adjustable spanner
- N III – Ring spanner

i) Holds different sizes of nuts and bolts.
ii) NI is used for holding pipes during plumbing work.
iii) Maintenance of NI – Lubrication of adjustable screw.

3. a) i) 1 – Disc harrow
2 – Disc plough
ii) Secondary cultivation / Harrowing
b) i) 2 (Disc plough)
ii) It is able to fide over obstacles, bouncing on its springs.

4. **1996:**
i) Smoothing rounded/curved edges of timber.
ii) To check verticalness of an upright object.

5. **1997**: Hacksaw / pipe cutter.

6. **1998:**

- Cleaning it after use.
- Lubricating the adjustment screw.
- Sharpening the plane iron / blade
- Tightening loose screws and nuts.
- Proper storage
- Replacing the broken parts.

7. **1998:**

- Spirit level/trowel/float.
- Plumb bob/plumb line.
- Mason's square/tape measure.
- String/line/mason's hammer
- Mason's chisel/bolster.

8. **1999 (a)**

- A tenon saw is shorter
- A tenon saw has a rigid flame at the back
- Unlike a cross cut saw.
- A tenon saw has more teeth per unit length
- Than a cross cut saw.
- A tenon saw is used in joinery work while the cross cut saw cuts wood across the grains.

b)

- Hold the work firmly.

- Ensure the saw is in good working condition / straight blade / sharp teeth / well set teeth/firm handle.

c)

- proper storage after use
- Oil the blade to avoid rusting
- Sharpen the teeth
- Set the teeth properly
- Tighten the handle screws if loose / replace broken handle.

9. 2000

- Soil type/ hardness of the soil
- Vegetation cover of the field.
- Cost of the tool. Skills required
- Availability of the tool
- Availability of capital

10. 2000 <u>When to use a jembe and not a disc plough.</u>

- When the land is very steep.
- Lack Technical skills in operation of disc plough
- When size of land is too small
- When capital is inadequate to acquire a disc plough.
- When it is cost effective to use a jembe.
- When disc plough is not available.
- When inadequate time is available
- When land is rocky / stony.

11. 2000: a)

i) – Pruning / cutting crops
- Harvesting rice / grasses

ii) Pruning
- Cutting vegetative materials for planting / harvesting flowers.

b)

- To avoid injury to the user.
- To reduce repair / replacement cost
- To increase their durability / life span
- To make them more efficient.

c)

- Soil type/hardness of soil.
- Vegetation cover of the field
- Cost of the tool
- Skill required / availability of the tool
- Availability of capital.

12. 2001: (i)

L – Monkey strainer / wire strainer.
M – Sash clamp
N – Dibber
O – Spoke

(ii)

L – Touting fencing wire during fencing.
M – Holding pieces of timber together when joining them together. i
N – Making holes for transplanting. J
O – Smoothing curved/round edges of timber.

13. Tools used.

i. Monkey strainer/wire strainer.
ii. Steel/wood float
iii. Drenching gun.
iv. Butter churner.

14. 2003.

- Hand saw/bow saw.
- Claw hammer/plumb bob
- Hole digger/soil anger/panga.
- Ramming rod/builders trowel.
- Soil scoop/spade/shovel.
- Tape measure/mallet/garden line.

15. 2004: (a) M – Sickle
N – Pruning saw
P – Float
Q – Garden trowel.

(b) M – Harvesting rice/grasses
N – Pruning/cutting stems/branches in crops e.g. coffee citrus.
P – Spreading screed on concrete floors/wall
Q – Transplanting seedlings

LAND PREPARATION

1. 1994

- To kill the weeds
- Bury crop residues/organic matter into the soil
- Loosen up the soil/facilitate rainfall infiltration/improve aeration/easy penetration of roots.
- Control soil borne pests/diseases by destroying their life cycles.
- Make subsequent operations easier.

2. (ii)

- Clean after use.
- Hammer bent share
- Replace worn out parts e.g. hooks, share.
- Check, tighten loose nuts and belts during the day's work
- Oil shiny parts e.g. mould board, if of use.
- Paint metallic parts e.g. handle, beam and braces, to prevent rusting.
- Store properly in a shed.

3. 1997:

- To kill weeds
- To bury organic matter/crop residual into the soil
- To loosen up the soil/improve aeration/improve water infiltration/improve root penetration. To control soil borne pests/diseases.
- To make subsequent operations easier.

4. 1999:

- Type of crop/rooting system of crop to be grown.
- Type of implement available.
- Type of soil.
- Soil moisture content at ploughing time
- Presence of certain weeds e.g. cough grass.
- Source of power.

5. 2000:

- When the land steep
- Lack of skill to operate the disc plough
- When capital is inadequate to acquire disc plough
- When it is cost effective to use a jembe
- When there is adequate time.
- Where the land is rocky/stony.

6. 2000: (a)

- Kills soil organisms.
- Leads to loss of nutrients.
- Destroys soil organic matter.
- Leads to accumulation of some nutrients to toxic levels e.g. potassium.

(b)

- Control weeds/control pests and diseases
- Incorporate organic matter in the soil
- Improve soil physical conditions/attain appropriate tilt
- To make seedbed appropriate for growing certain crops e.g. in ridging.

(c)

- Saves time/reduce cost of production.

- Maintain soil structure
- Minimizes soil erosion.
- Minimizes root/tubers disturbance.
- Less laborious/conserves soil moisture.

7. 2001:

- Use of heavy machinery/implements when soil is wet.
- Continuous shallow cultivation.

8. 2001: Maintenance practices of a plough

- Cleaning after work
- Storing under shed
- Tightening loose nuts and bolts
- Replacing worn out parts/ repair broken parts.
- Greasing moving / rotating parts
- Oiling / painting for long storage.

9. 2002 <u>Destroy soil organisms</u>

- Loss of soil nutrients / loss of soil fertility.
- Accumulation of some nutrients to toxic level e.g. potash.
- Destruction of organic matter by oxidation / burning.

10. 2003 <u>Reasons for secondary cultivation</u>

- Control weeds
- Control pests and diseases
- Incorporates organic matter in the soil
- Improves physical condition / form required tilth
- Make appropriate tilth for planting certain crops e.g. ridging, rolling. leveling.

11. 2004 <u>Benefits of minimum tillage</u>

- Saves time and costs of production.
- Maintains soil structure
- Minimizes soil erosion.
- Less laborious
- Conserves moisture
- Minimizes root damage.

12. i)

- Cost / expenses / when distance is short
- Availability of skilled worker.

13. 2000:-

- Disc harrow / rotavators
- Spring tine harrow / rigid tine harrow / ox – tine harrow.
- Spike toothed / peg – toothed harrow
- Chain harrow / zigzag harrow

14. 2004

- Application of herbicides.
- Use of mulch / timely cultivation
- Use of cover crops
- Uprooting / slashing / grazing to control weeds

<u>WATER SUPPLY IRRIGATION</u>

1. 1994

- Transporting in containers.
- Piping / use of channels.

2. **1995:** Dams/ ponds, Tanks / containers

3. **1995:**

- Draining the land / Any method of drainage.
- Growing water tolerant crop e.g. rice
- Ridging / making furrows.

4. **1996:**

- Boiling water / filtration
- Use or chemicals / chlorination / alum / soda ash
- Aeration of water / sedimentation.

5. **1997**

a) Dams / weirs tanks / containers

b)

- Piping / use of pipes
- Use of channels
- Use of containers by vehicles , animals

6. **1998:**

- Centrifugal / rotor dynamic pump.
- Reciprocating / piston pump
- Semi – rotary pump
- Hydram pump / hydraulic ram.
- Rotary pump / hydraulic ram.

7. **1998:**

- Quantity of the material / durability.
- Size of the pipe / diameter / length
- Working pressure / thickness of the wail.
- Colour of the pipe of the pipe.

8. **1998: a)**

- Type of soil
- Type of crop to be grown
- Source of water / quality of water
- Size of land to be irrigated
- Capital available / topography of land
- Profitability / viability of the enterprise.

b)

- Water is evenly distributed over the required area
- Less water is used / it more water economical.
- Causes less soil erosion in sloppy areas compared to surface irrigation
- Leveling of land is not necessary
- Help to clean the plant for ease of transpiration / photosynthesis.
- Soluble fertilizers can be applied with irrigation water more easily than in surface irrigation.

c)

- Use of sprinkler
- Use of hose pipes
- Use of watering cans.

9. **1998**

- Quality of material used for making the pipes / durability / resistance to rodent attack.
- Size of pipes i.e. diameter / length.

- Working pressure of the pipe / thickness of the pipe wall.
- Colour of the pipe.

10. 1998:

- Centrifugal motor dynamic pumps
- Piston / reciprocating pump
- Semi rotary/Hydram
- Rotary pump.

11. 2000 Uses of water

- For diluting / mixing chemicals used to control pests, diseases, weeds for watering livestock e.g. drinking.
- Watering plants e.g. irrigation
- In processing farm produce e.g. coffee, carrot hides.
- Domestic use e.g. drinking cooking
- For rearing fish.
- Mixing concrete in construction
- Recreation e.g. swimming pooling.
- Cooking and running machine engines water treatment plant and process.

12. 2000: a)

- To remove bad smell/taste from water thus makes it fit for human consumption.
- To kill disease causing organism that thrive in dirty water.
- To remove solid particles/impurities.
- To remove excess chemicals e.g. fluorine/that may cause hardness in water.

b)

- For diluting/mixing chemicals e.g. pesticides.
- Acaricides, herbicides, fungicides.
- For watering livestock.
- For irrigation/watering crops.
- For processing farm produce e.g. hides, coffee, carrots.
- For washing farm tools equipment and farm structures e.g. animal houses.
- For domestic use e.g. cooking, drinking, sewerage disposal.
- For rearing fish.
- Mixing concrete/mortar in construction.
- Recreation purposes e.g. swimming pools.
- For cooling/running machines

c)

Stage I: Filtration at intake: Water is made to pass through a series of sieves. Sieves trap large solid impurities.

Stage II softening of water Soda ash (sodium hydrogen carbonate is added into the water).

Stage II coagulation and sedimentation Alum/aluminum sulphate is added into the water. Alum facilitates coagulation and sedimentation of solid.

Stage iv , filtration Water is passed through a filtration tank, that removes all solid impurities.

State v; chlorination Small amounts of chlorine solution is added to the water chlorine kills pathogens disease causing organisms.

Stage vi storage Treated water is stored in clean tanks before use/distribution.

13. 2001

- Size of the farm

- Type of enterprises in the farm
- Source of water
- Method of conveyance of water

15. 2002

- It is water economical
- Can use water under low pressure
- Does not encourage fungal diseases
- Discourage growth of weeds between the crop rows

16. 2003

- Repair/ replace worn out parts
- Regular cleaning
- Regular painting to prevent rusting

17. 2003 The water treatment process

Stage 1. **Filtration of an intake**
Water is made to pass through a series of sieves where large particles of impurities are trapped

Stage 2 **Softening of water**
Water is let to circulate in a tank (open) and mixed with soda ash to soften it

Stage 3 **Coagulation and sedimentation**
Alum is added to water to facilitate sedimentation and coagulation. Water stays here for 36 hours

Stage 4 **Filtration**
Water passes into infiltration tank where all the remaining solid particles are removed.

Stage 5 **Chlorination**
Filtered water enters chlorination tank where a small amount of chlorine is added to kill disease agents.

Stage 6. **Storage**
Treated water is stored before entering distribution channels for use.

18. 2003

- Furrow irrigation/ corrugate irrigation
- Basin irrigation/ flood irrigation

19. 2003

- Open ditches
- Underground perforated pipes
- French drains
- Cambered beds/ pumping water
- Breaking hard pans/ sub- soiling

20. 2004 (a) Dams/ weirs/ streams/ river ponds/ lakes

(b)

- Kill pathogens
- Remove sediments
- Remove bad smell/ taste
- Remove chemical impurities

21. 2004 Reasons for water treatment

- To remove bad smell and taste
- To kill harmful micro-organisms which thrive in dirty water e.g. bacteria.
- To remove solid particles e.g. soil, sand sticks

- To remove excess chemical impurities e.g. fluorides to soften water

SOIL FERTILITY

1. Benefits of farm yard manure

- Improves soil structure/ water holding capacity
- Supplies more than one plant nutrient
- Longer residual effect
- Promotes microbial activities in the soil
- Locally available
- Imparts a dark colour to the soil which help in temperature regulation
- Buffers soil PH/ improves cation exchange capacity

2.(a)

- Ability of a soil to produce and sustain high crop yields continuously by providing adequate moisture, nutrients, oxygen, space and freedom from pests and diseases damage.

(b)

- Adequate depth
- Enough aeration
- Adequate moisture
- Sufficient nutrients
- Freedom from pests and diseases

3. (a)

(i)

- Foundation materials e.g. maize stalks accept material that occur in abundance
- Kitchen refuse, leaves
- Farm yard manure/ any well rotten manure
- Ash/ pottesic fertilizer
- Top soil
- Leaves cover/ trash

(ii) Importance

- Provide source of micro- organism
- Enrich the manure with K and P.3
- Provide food for micro- organism that bring about decay

(b) (i) Sharp pointed stick checks the temperature of the manure during its formation to avoid over heating

(ii) Prevent entry of too much water causing water logging, poor decomposition and leaching of nutrients.

4. (a)

(i) A- Pit method
B- Heap system

(ii)

- Drainage/ free draining soils on site
- Type of soil
- Topography/ slope should be gentle

5. 1995

A crop is grown and then ploughed and incorporated into the soil while it is still green

7. (a)
- Farm yard manure (FYM) improves soil structure/ improves soils water holding capacity.
- Supplies a variety of plant nutrients
- Has a longer residual effect
- Promotes microbial activities in the soil
- It is locally/ easily available
- Moderates the soil pH/ increases cation exchange capacity

(b)
- Species of animal from which the waste is collected
- Food material eaten by the animal
- Material used as bedding
- Method of storage of the FYM
- Age of the animal which produces the waste matter
- Age of the farm yard manure.

(c)
- It is bulky hence difficult to apply/ laborious/ difficult to store/ handle
- It has less nutrients per given volume
- May spread weed seeds
- May spread crop diseases e.g. black scurf in potatoes
- Releases nutrients slowly

8. 1998
- Leaching/ soil erosion
- Plant uptake
- Volatilization/ burning/ denitrification

9. 1999
- Leaching/ soil erosion
- Change of soil pH
- Burning of land/ volatilization/ denitrification/ accumulation of salts
- Fixation of nutrients/ nitrogen lock up
- Uptake by plants/ weeds/ continuous cropping
- Soil capping/ formation of hard pan
- Presence of soil – borne pests/ monocropping

10. 2000
- Rapid growth rate
- Production of abundant foliage
- Rich in plant nutrients/ leguminous/ rich in nitrogen
- Ability to decay quickly
- Adaptable to wide range of conditions/ hardy.

11. 2002
- Method of storage
- Degree of decomposition
- Type of organic matter used
- Presence/ absence of non – biodegradable materials

- Amount and type of inorganic fertilizers added.

12. 2003
- Appropriate depth
- Proper drainage/ good water infiltration
- Well aerated/ good water holding capacity
- Adequate nutrients/ correct pH
- Free from excessive infestation of soil borne pests and diseases.

13. 2003
- Cultivation along the slopes/ across contours/ along river banks
- Continuous cropping with annual crops
- Pulverization of soil due to over- cultivation
- Burning of vegetation/ overgrazing

14. 2005
- Improves soil structure
- Reduces leaching
- Improves water holding capacity
- Increases microbial activities
- Increases cation exchange capacity
- Improves nutrient status upon decomposition
- Burning of vegetation/ overgrazing

LIVESTOCK PRODUCTION (COMMON BREEDS)

1. 1996

(i) Dromedary *camelus dromedaries*

(ii)
- Can stay for long periods without water
- Can with stand extremes of temperature
- Able to eat dry feeds
- It has thick hide and deep layer of subcutaneous which insulates in against effect of radiant heat
- Feet have large surface area which enable it walk on sand without sinking

(iii) Characteristics of indigenous cattle
- More resistant to tick borne diseases/ trop diseases
- Can withstand high temperatures
- Can survive on poor quality pastures
- Can walk long distance in search of pasture and water
- Have lower feed and water intake

(iv) Features of exotic beef cattle
- Blocky/ square/ rectangular in shape
- Low set/ short legs
- A fleshy body
- Thick neck
- Smaller udders

3. 1998 (i) Jersey verses Friesian
- Jersey requires less food.
- Jersey are more tolerant to heat.
- Jersey can survive on poorer pastures.

ii. Characteristics of goats that adopt them rid areas
- Good foragers hence survive on poor pastures.
- Ability to eat dry feeds
- Heat tolerant tissues.

iii. <u>Ways of improving indigenous cattle production.</u>
- Cross breeding with exotic breeds with superior characteristics.
- Supplementary feeding.
- Proper control/prevention of livestock diseases.

1 (i) Jersey
(ii) Friesian

4. 1999:
- Are more resistant to tick-borne diseases/tropical diseases.
- Can withstand high temperature.
- Can survive on poor quality pastures
- Can walk for long distances in search of pasture and water.
- HAVE lower feed and water requirement.
- Layers/Broilers/Dual purpose

AGRICULTURAL ECONOMICS

1. 1994 The four types of records that a farmer should keep
- Field operations records.
- Production records
- Consumable goods inventory.
- Permanent goods inventory.
- If there is no inventory records.
- Market records
- Labour records
- Breeding records.
- Breeding records
- Benefits of labour

2. 2001 Reasons for keeping health record
- For use in selection and culling of animals on health grounds.
- Help to detect theft on the farm
- Help in planning and making sound decision
- Provide information for income tax assessment
- Help to determine how creditworthy is a farmer.
- Shows the assets and liabilities of the farmer
- Determine the value of the farms.
- Used in comparing performance between' enterprises/seasons/different farms.
- Help to solve disputes on the farm.
- Provide a history of the farm
- Help to determine terminal help trace history of diseases for better approach in treatment.
- Show when to vaccinate, deworm.
- Show costs on health of the animals in assessing/no fat ability of animals.

3: Conditions under which opportunity cost is zero
Where there are no alternative enterprises to choose from/competing for resources available
This is the value of foregone best alternative/choice. When resources are free/unlimited.

9. 2005: If there is no choice. When resources are free/unlimited.

SOIL FERTILITY II- INORGANIC FERTILIZERS

1. **2001:**
   They are highly soluble water/ easily leached/ no residual
   Have a scorching/ burning effect on crops
   They are highly volatile
2. **1996:**
   5 kg of K2o is contained ii 100kg of 25: 10:5

   Therefore 400kg of fertilizer contains $\frac{400x5}{100}$=20kg
3. **1996:**
   Help in Carbohydrate formation and translocation/plays role in plant metabolism
   Assists in uptake on Nitrates from the soil
   Imparts diseases resistance to crops
   Strengthens straws of cereals
   Formation of chlorophyll
   Help neutralization of organic acids in plants.
4. **1997:**
   - Lodging in crops/ weak sterns
   - Scorching of leaf tips and margins.
   - Chlorosis.
   - Premature leaf fall.
   - Mottling/brownish spots on leaves
   - Stunted growth.
5. **1998:**
   - Leaching
   - Plant uptake.
   - Volatilization/burning
6. **2001**
   (a)
   - Needed in protein synthesis.
   - Hastens vegetative growth in crops.
   - A constituent of the chlorophyll molecule
   - Increases the size of cereal grain
   - Regulates the availability of phosphorous and potassium.
   - Improves succulence in crops.

   (b)
   - Chlorosis of leaves
   - Stunted growth.
   - Premature ripening of crops.
   - Premature leaf fall
   - Formation of purple pigments.
7. **2003:**
   - Lodging? Weak stems? over succulence of stems
   - Scorching of leaves
   - Delayed maturity.
   - Excessive foliage growth.
   - Cause blossom end rot in tomatoes
8. **2004:**
   - Amino acids/protein synthesis
   - Increase oil content and hormones

- Needed in formation of chlorophyll.
- Aid in Nitrogen fixation in legumes
- Needed in carbohydrates metabolism.

9. 2004:

Leave have purple pigmentation
Stunted growth
Poor root development
Lodging/weak stems in cereals
Poor seed and fruit formation

10. 2005:

- Broadcasting
- Foliar application
- Side/row/basal application
- Fertigation
- Hole placement/drilling

11. 2005: a)

Macro nutrients are required by the plants in relatively large quantities, but macro nutrients are required in small quantities

b)

- Elongation of apices of roots and shoot,
- Strengthens plant cell wall
- Help in protein formation
- Help in formation of the middle lamella
- Used in cell division

CROP PRODUCTION- PLANTING

1. 1995

- Early maturity of the crop
- Plant assumes desired shape and size.
- Possible to obtain two or more varieties of oranges on one root stock
- Highly yielding.
- Maintains parental genetic characteristics.
- Possible to propagate seedless e.g orange varieties.

2. 1995: (a)

- Seed economical
- Easy to achieve correct spacing
- Make subsequent operations easy

b)

- To obtain optimum plant population/efficient land use.
- Avoid competition for resources.
- Control spread of pests and diseases.
- Makes subsequent operations easy/easy to mechanize.

3. 1996.

- Soil moisture content
- Seed size.
- Soil type.
- Type of germination
- Soil moisture content
- Soil fertility.
- Machinery to be used.
- Intended use of the crop.

- Growth habit
- Prevalence of pests and diseases.
- Cropping system used.

4. 1997

- To enable the crop to smoothens.
- For maximum utilization of seasons rainfall.
- Enable the crop evade serious attack by pests and diseases.
- Enable maximum utilization of available nutrients before they are leached.
- Reduced competition for labour.
- To get good market price.

5. 1997

- To improve Nitrogen fixation in the roots of legumes

6. 1997

- Highly yield.
- Eases control of weeds/pests/diseases.
- Aids in soil and water conservation.

7. 1998

- Variety of maize
- Method of planting
- Purpose of the crop.
- Soil fertility
- Soil moisture content
- Number of seeds per hole.
- Use of machinery in subsequent operations

8. 1998

- Rainfall pattern/reliability.
- Variety of beans
- Incidence of pests and diseases attack.
- Expected harvesting time.

9. 1999

- To obtain high yield.
- Reduce pest/disease /weed attack
- To ensure high germination percentage,
- To obtain high quality produce.
- To obtain high quality produce.
- To obtain seeds suitable to the particular area.

10. 1999

- Fertility status of the soil
- Use moisture content.
- Use to which the crop is to be put, machinery to be used.
- Growth habit of the crop/variety
- Number of seeds per hole.
- Prevalence of certain diseases, pests
- Crop stands either pure or mixed.

10.2000

- Intensive land use.
- Control soil erosion.
- Reduce cost of production
- Ensure early pasture establishment.

11. 2000: (a)

- Induces lodging

- Difficult to carry out field operations.
- Reduced yields.
- Low quality produced/ small cobs.

(b)

1 ha= 10,000m^2

1m x 0.5m

= 20,000 plants/ha

12.2002

- Thinning
- Gapping

13.2002

- Free from pest/ disease attack
- Resistant to diseases
- High yielding
- Has high quality produce
- High rooting ability
- Early maturing

15.2002

- Rainfall availability
- Incidence of pests and diseases
- Expected weather conditions during harvesting
- Market demand of the crop
- Type of soil

16. 2002

- Uses higher seed rate
- Not easy to sue machines
- Not easy to establish the right population
- Overcrowding in some areas
- Uneven germination
- Difficulty to carry out field practices

17. 2004

- Soil type
- Soil moisture content
- Size of seeds
- Type of germination

18. 2005

- Enable the crop to withstand competition from weeds
- Enable the crop to escape attack by pests and diseases
- To better utilization of nutrients in the soil
- For better utilization of available rainfall
- To get good market
- To reduce competition for labour
- To time harvesting to occur during appropriate weather conditions

CROP PRODUCTION – NURSERY PRACTICES

1. 1996/ 2005

(i) Reduce competition/ ensure healthy seedlings

(ii) Prepare the seedlings for the harsh conditions expected in the field

2. 1997

Removal of the shade

Reduce the frequency of watering

3. 1998:

- Free from pest/ diseases
- Resistant to diseases
- Adaptable to different soil pH
- Can withstand water loggings
- Compatible with several scions

4. 2006

- Requires less skills to establish
- Easier to prune
- Higher yielding in the early years of bearing
- Does not allow accumulation of CBD due to frequent removal of old stems
- Comes to bearing earlier

CROP PRODUCTION – FIELD PRACTICES

1. 1997/2005

- Allow adequate light penetration into the plant
- Improve quality of the fruits
- Reduce incidence of pest and disease attack
- Enable effective use of chemical sprays
- Facilities easy harvesting

1998:

- To prevent sprouting
- Reduce pest attack
- To prevent fungal diseases/ rotting

4. 1999 (a)

- Facilitates field practices e.g spraying and harvesting
- Improves the quality of crops by preventing soiling
- Enable crop grow in the required direction
- To improve yield
- To control pests and diseases

(b)

Passion fruits, tomatoes, cucumber, grapes, tea, pumpkin, water melons, Boungain vellia, garden peas, yams, gourds, indeterminate beans, roses, money plant, hops, okra

5. 1990

- Moisture content of grains
- Colour of leaves and grains
- Intended use of the crop

6. 1999

- Improves soil aeration upon decomposition
- Reduce toxicity of plant poisons upon decomposition
- Reduce soil erosion
- On decomposition it improves soil structure
- Modify the soil temperature

- Add nutrients on decomposition
- Improves water infiltration
- Increases microbial activity
- Control weeds
- Reduces evaporation of water
- Buffer soil pH upon decomposition

7. 2000

- Reduce run - off thus increase soil moisture
- Reduce evaporation thus maintaining high moisture in the soil

8. 2001 (a) Growing of different types of crops on the same piece of land following orderly sequence.

(b)

- Ensure maximum utilization of nutrients
- Control soil – borne pests and diseases
- Control weed
- Add nitrates into the soil
- Control soil erosion
- Improve soil structure

(c)

- Deep rooted crops alternate with shallow rooted ones
- Crop easily weeded are alternated with those difficult to weed
- Crops of the same family should not succeed each other
- Heavy feeders should come first in the cycle
- Include a legume crop

CROP PRODUCTION V- VEGETABLES

1. 1996 (a)

- Irregular watering of the crop/ water stress
- Excess application of Nitrogen in early stages
- Deficiency of element calcium in young fruits

2. 1996/ 2005 (a)

- Regular watering
- Addition of calcium into the soil
- Mulching

(b)

- Regular watering
- Addition of calcium into the soil
- Mulching
- Avoid excess Nitrogen in the soil

(c)

- Size of fruits
- Degree of ripeness
- Damage of tomatoes
- Shape of fruits

LIVESTOCK HEALTH – INTRODUCTION

3. 1996/1997 (a)

- They have a longer productive life
- Produce high quality produce
- They are less expensive to keep

- They are high yielding
- Do not spread diseases others/ man
- They breed regularly

2 (b) 1997

- Foot and mouth diseases
- Anthrax
- Rinder pest
- Lumpy skirt disease
- Rabigs

3. 1999

- Prevent deficiency disease
- Improves animals and ability to resist diseases

4. 2000

- General farm hygiene/ cleanliness of houses. Feed/ water trough – W proper carcass
- Disposal; to destroy pathogens
- Isolation; prevents spread of the diseases
- Drenching; to control internal parasites
- Treat sick animals; prevent spread of the diseases
- Vaccination; develop resistance against diseases.
- Control vectors, prevent transmission of diseases
- Prophylaxis; avoids infection
- Slaughtering en- mass; prevent spread of diseases
- Proper breeding; control breeding diseases
- Quarantine; avoid spread of the diseases
- Hoof trimming; minimize occurrence of foot rot
- Proper housing; avoid predisposing causes of diseases

5. 2002

- Through vectors/ external parasites
- Ingesting contaminated feed, water, milk
- Inhaling contaminated air
- Through surgical and instrument e.g. scalpels, needles, docking knife etc
- Mating
- Suckling young ones

LIVESTOCK HEALTH – PARASITES

2. 1995 (a) (i)

- Red water (Babesiasis)
- Gall sickness (Anaplasmosis)

(ii)

- East Coast Fever (ECF) Theileriosis
- Red water (Babesiasis)
- Nairobi sheep disease
- Texas fever

(b) Two hosts

2. 1998 (a)

- Anaemia
- Irritation/ scratching
- Loss of hair
- Wounds on skin

- Presence of parasites on the body

(b)

- Regular drenching
- Rotational grazing
- Drain swampy areas
- Use of latrines by farm workers
- Use appropriate chemicals on swampy areas/ sue $CuSO_4$ solution
- Burn heavily infested pastures
- Plough infested pastures
- Peripheral fencing
- Use of ducks on snail

(c)

(i) Pig
(ii) Fresh water snail

3. 2000

- Larvae climbs on host
- Larva feed on 1st host
- Larva drop on the ground and moults into a nymph
- Nymph climbs – onto 2nd host
- Nymph feeds on 2nd host
- Nymph drops on the ground and moult into an adult
- Adult climb on 3rd host
- Adults feeds and mate on 3rd host
- Mated, engorged female drops and lay eggs on the ground
- Egg hatches into larvae

4. 2003

- Burning infested pastures
- Hand picking and killing of ticks
- Rotational grazing
- Double fencing of pastures
- Zero grazing
- Ploughing infested pastures

5. 2004

- Proper meat inspection
- Proper disposal of infested carcass
- Routine deworming of livestock/ human beings pets
- Rotational grazing
- Proper use of latrines
- Proper cooking of meat
- Burning/ ploughing infested pastures

LIVESTOCK HEALTH – NUTRITION

1. 1995/ 2002

- Production ration is the feed given to an animal over and above maintenance level in order to produce a given product

2. 1995

- Water soluble vitamins
- Fat soluble vitamins

3. 1996

- Size of the animal
- Level of production
- Type of feed eaten
- Ambient temperature
- Physiological status of the animal
- Species of the animal

4. 1996

(a) Roughage is a feed with high fibre content and low energy content; while concentrates is a feed with high protein/ energy content and low fibre content

(b)

- Synthesis/ formation of various products e.g. milk, meat
- Foetal development
- For work. Provide draft energy
- Growth

4. 1992

- Bulky
- Low digestibility
- Low in energy/ protein content
- Highly fibrous
- Plant origin

5. 1998

- Raw materials for synthesis of livestock products e.g milk, eggs
- Growth of cells
- Production of energy
- Formation of enzymes. Hormones and antibodies
- Repair of worn out tissues

6. 1999/ 2002

- Body weight/ size
- Age of the animal
- Work done
- Level of production
- Physiological condition e.g. pregnancy
- Weather conditions ambient temperature

7. 2000

- A component of milk
- Formation of the skeleton / teeth
- Blood clotting
- Nerve functioning/ control milk fever

8. 2001

- Nutrient requirement of the animal
- Age of the animal
- Type of animal whether ruminant or non- ruminant
- Availability of feedstuffs
- Cost of the food stuffs

10. (a) 2002

- Production ration is the feed given to an animal over and above maintenance level in order to produces a given product

(b) 2002

- Body weight/ size

- Age of the animal
- Work done
- Level of induction
- Physiological condition e.g. pregnancy
- Weather conditions/ ambient temperature

11. 2004

- Provide energy/ maintenance of body temperature
- For growth and repair of body tissues
- For maintenance of good health
- Production of various products
- Enhance reproduction

LIVESTOCK PRODUCTION (III)–SELECTION & BREEDING

1. 1994

By concentrating genes from the parents to the offspring's

2. 1994

- Reddening and swelling of the vulva
- Clear mucus discharge from the vulva
- Frequent bellowing
- Cow mount others
- Cow stands still when mounted by others
- Cow becomes restless
- Slight rise in body temperature
- Slight drop in milk in lactating cows
- Loss of appetite urinating frequently

3. 1996

- It is uneconomical to keep a bull
- May lead to uncontrolled mating
- High risk of transmission of breeding diseases
- Only a small number of cows can be served

4. 1997: Mating of two unrelated animals of the same breed

5. 1997 (a)

(i) A- Oviduct/ fallopian tube
B- Ovary
C- Uterus
D – Vagina

(ii) A – passage of Ova from the ovary to the uterus
-Site of fertilization
B – Production of ova
Production of female sex hormones

(b)

(i) Artificial insemination
(ii) Natural method

(c) 19 – 23 days/ 3 weeks

1998:

Increased ability and performance of the offsprings above the average of the parents

7. 1999

- Should be of age/ mature S – 7 months old/ 90 – 100kg live weight
- Good mothering ability
- Able to grow fast
- Good conformation

- With no physical defects
- Healthy
- Has 12- 14 teats
- Highly prolific
- Able to withstand heat stress during mating

8. 2003

(i) Mating closely related animals e.g brother and sister
(ii) Mating unrelated animals but within the same

(b)

(i) Harmful traits/ diseases can spread fast
(ii) Requires trained personal/ skills
(iii) Laborious
(iv) Low chance of conception due to poor timing/ death of sperms,

(c)

- Good body conformation/ wedge shaped
- Docile/ mild temperament
- Her ancestors should have a record of high milk production
- Free from physical deformities
- Good health
- Good size/ weight for the breed

LIVESTOCK PRODUCTION (IV) – REARING PRACTICES

1. 1994

- He goats
- Male calves
- Rams

2. 1993

- Bad smell
- Overheating
- Lack of food/ water
- Sick/ infertile queen
- Attack by predators/ destruction of brood
- Too much noise

3. 1996: J (i) Docking/ Tailing

(ii)

- To facilitate mating/ to ease mating
- To control blow fly attack
- To ensure uniform distribution of fat

(iii) 1-2 weeks after birth

(iv)

- Use of elastrators and rubber ring
- Use of sharp knife
- Use of a docking iron

(v) Hoof trimming

(vi) The animal would become lame
Foot rot may develop

(vii) In a sitting position facing away from the person shearing

4. 1998: To make the bees less aggressive

5. 1998

- Old age
- Low fertility

- Difficult in furrowing
- Less milk production
- Passing undesirable characteristics to its young ones
- Poor hearth
- Poor mothering ability

6. 1998 (a) Thick yellow secreted by the mammary glands within the first week after giving birth

(b)

- Has a laxative value that helps to cleanse the bowels
- Rich in antibiotics that confers artificial immunity
- Highly nutritious is necessary for fast growth) of the calf
- It is highly digestible, hence appropriate for the underdeveloped calf's digestive system

(c)

- Bucket feeding/ Artificial feeding
- Natural method/ calf sucks the dam

6. 1999

- Restlessness
- Loss of appetite
- Swelling of vulva
- Udder enlarges
- Mucus discharge from the vulva
- Presence of colostrums in the teats
- Relaxation of ligaments on either side of the pelvic bones
- Cow isolate herself

7. 2000

- To make them docile
- To improve growth rate
- Control breeding diseases
- To prevent inbreeding
- To control breeding
- To improve meat quality

8. 2000

- Highly palatable
- Has high digestibility
- Rich in nutrients

9. 2000

- Prevent the bees from absconding
- To avail food during time of seed scarcity
- To attract bees into a new hive
- To encourage multiplication of bees
- To ease access of feed

10. 2000

- Proper feeding
- Control internal parasites
- Control external parasites
- Vaccination
- Zugging/burlying
- Hoof trimming
- Provision of adequate clean water
- Treat in case of infection

12. 2001
- Routine feeding
- Application of manure/ fertilizer
- Cropping
- Maintenance of water flow/ changing the water regularly
- Control of predators

13. 2002
- Restless
- Loss of appetite
- Udder/ teats enlarge
- Present of milk in the teats 24hrs before farrowing
- Vulva enlarges
- Muscle on either side of the tail/ pelvic bones slackens
- Sow prepares a nest

14. 2002
- During drought/ when there are no flowers
- Incase of a new colony
- When the colony is small/ to encourage fast multiplication

15. 2003
- Deworming
- Flushing
- Crutching/ ringing/ cutting wool around reproductive organs
- Riddling
- Wigging/ cutting wool around the face

16. 2005
- Catfish
- Tilapia
- Trout
- Carps
- Bass
- Tench
- Blue gill
- Nile perch

FARM STRUCTURES

1. 1994

(i) 0.5m/50cm
(ii) To prevent dampness
(iii) To allow proper lighting
(iv)
- Nearness to the milking shed
- Well drained area/topography.
- Soil type
- Security
- Wind direction

2. 1995
- It is cheap
- It is attractive
- It is easily available
- Easy to work with

3. 1995 Siting

- Should be near the homestead for security
- Should be in an accessibility place
- Sheltered from strong wind
- A well drained area
- On the leeward side of the farm house
- Where there is large space for possible expansion in future

Selection of building materials

- Use easily available materials
- Choose durable materials
- Consider the cost of the material
- Consider the skills needed to work with the materials
- Materials to choose from; iron sheets, wire mesh off cuts, timber, concrete

Requirement of the hutch

- Should be leak proof
- Should be well ventilate
- Should be free from draught
- Should be easy to clean
- Should have raised floor
- Floor should allow free drainage

3. 1996

- To prevent warping/ bending / twisting
- To prevent rotting/ damage by fungi
- To prevent it from pest attack
- To enable timber to achieve it maximum strength

4. 1996

Advantage: It's more effective in preventing animals from forcing their way through the fence

Disadvantage: It's more expensive than plain wire
The bars may cause injury to the animal/ destroy wool.

5. 1996

- Allows air circulation in the house
- Controls temperature in the house
- Prevent humid condition inside the house

7. 1996: 1 cement, 3 and, 4 ballast/ gravel

(b) 1/ cement

(c)

- It is durable
- It is fire proof
- It is easy to clean
- Can be moulded into various shapes

9. 1997

- Should be raised from the ground
- Should be leak proof
- Should be easy to clean
- Should be well ventilated
- Should be rat proof/ vermin proof
- Should be easy to toad/ offload
- Strong enough, spacious

10. 1998

- Reduces incident of accident when using them

- Ensure efficient usage of the structure
- To increase its durability
- To give high re- sale value of the structure

10. 1998

- Topography/ drainage
- Accessibility of the pen
- Wind direction
- Direction of the sun
- Security of the calf
- Location of existing, structure/ amenities
- Space for future expansion

(b)

- Strength/ durability of the material
- Cost of the material
- Availability of the material
- Availability of capital
- Workability/ skills required in using the material
- Type of pens (permanent/ temporary)
- Climate of the area
- Safety of the calf

(c)

- Repair/ replace worn out/ broken parts
- Clean the pen regularly
- Ensure drainage system is working
- White wash the walls

11. 1999

- Partial burning/ charring of the posts
- Cut the top in a sloping manner
- Cover the top with a plastic/ metal sheet
- Reinforce with concrete

12. 1999

- Well ventilated
- Easy to clean
- Leak proof
- Well drained floor
- Draught free
- Spacious
- Well lit

13. 1999

- Repair/ replace broken parts
- Regular cleaning to remove dirt
- Dust/fumigate/ spray to control parasites and diseases
- Apply old engine oil on timber parts
- Ensure good drainage around the house
- Maintain a footbath at the entrance

14. 2001

- It is more durable
- Its stronger
- Its fire resistant
- Its not attacked by vermin's

15. 2001 (a)

- Provide security from thieves, predators
- Enable paddocking/ rotational grazing/ mixed farming
- Control parasites and diseases by keeping away foreign animals
- Show boundaries between farms
- Hedges act as wind breaks
- Have an aesthetic value
- Hedges help to conserve soil and water
- Hedges may be source of fruits/ fodder/ firewood
- Provides privacy
- Enables isolation of animals for different purposes

(b)

- Wind direction
- Soil type
- Security
- Accessibility of the structure
- Location in relation to existing structure
- Topography/ drainage
- Government policy/ regulations
- Purpose of the structure
- Position of the sun
- Proximity to social amenities
- Space for future expansion
- Farmers tastes and preference

16. 2002 adds beauty to the farm

- Source of firewood
- Source of fodder/ mulch material
- Serves as a wind break
- Control soil erosion
- Controls animal/ human movement
- Provides security/ privacy
- Mark farm boundaries

17. 2003

- Top bars can easily be removed and replaced when inspecting the combs
- Easy to construct
- Ensure high quality honey
- Easy to harvest
- Help to avoid mass killing of bees
- Possible to exclude the queen from the honey combs

18. 2003

- Paint metal tanks
- Regular washing of the tank
- Repair any leakage

19. 2004 (a)

- **Claw hammer;** for driving in and out nails from wood
- **Tape measure;** to measure the required sizes of timber
- **Tin snip;** for cutting iron sheets for roofing
- **Clamp/ sash camp;** for holding tightly together pieces of wood when cutting/ joining
- **Handsaw:** for putting timber to the required size
- **Wood chisel/ Brace/ hand drill;** for boring holes in wood
- **Mallet;** for hitting the chisel when boring holes

- **Pliers;** for cutting wires
- **Jack plane;** For smoothing timber surface
- **Marking/ mortise gauge;** for marking points for cutting / planning on timber
- **Ball pen hammer;** for straightening/ shaping metal sheet
- **Try square/ combination square;** for determining right angles on cutting points of timber

(b)

- Clear the site to be fenced
- Use a string to layout the fence line
- Determine the position of posts using a tape measure
- Dig the holes using a hole digger/ claw bar
- Use a ruler to determine the right hole depth
- Obtain the right length of the posts using a tape measure
- Obtain the posts to the required depth using a handsaw
- Put concrete at the bottom of the hole
- Place the posts in the holes
- Ensure posts are vertical/ right angles
- Fill up the hole with soil/ concrete
- Firm the soil/ concrete in the hole using a ramming rod
- Heap soil/ concrete at the base of post

20. 2005

- It is more expensive
- It requires a lot of skills to work with
- Prone to rusting
- Its not easily available
- Its heavy and difficult to transport

SOIL AND WATER CONSERVATION

1. 1995

- Reduce the speed of water hence erosive ability
- Trap soil being carried by moving water
- Increase infiltration of water hence reduce surface run- off

2. 1996

- Reduce the volume of run- off due to increased infiltration
- Acts as windbreakers
- Reduce the impact of raindrops on the soil
- Tree roots bind the soil particles together reducing its erodibility
- Reduce the impact of raindrops on the soil
- Reduce speed of run- off
- Improve soil structures thus reducing the erodibility of soil

3. 1997

- To prevent loss of plant nutrients
- To maintain good soil structures

4. 1998

- Reduce the seed of run- off thus lowering the erosive of water
- Reduce impact of raindrops thus reducing splash erosion
- Cover the soil protecting it from wind erosion
- Grass roots bind the soil particles together reducing the erodibility of soil
- Reduce speed of run – off, thus reducing the erosive power of water

- Organic matter from grass improves soil structure thus reducing erodibility of the soil

5. 2003 – Reduce evaporation
- Reduce surface run- off

6. 2004 (a) Afforestation is the practice of growing trees in areas where they had not existed,

(b) Re- afforestation is the practice of growing trees where they have been harvested.

6. 2005
- Topography of the area
- Rainfall intensity/ amount
- Type of soil
- Soil depth
- Vegetation cover
- Farming practices

WEEDS AND WEED CONTROL

1. 1998
- Prevents weeds from establishing in the field
- Prevent allelopathic effects of weeds
- Reduce the cost of crop production
- Reduce multiplication and spread of the weeds
- Reduce spread of pests/ diseases for which weeds acts as alternate hosts
- Reduce competition between weeds and the crop
- Avoid contamination of crop with weed seeds
- Prevent injury to the farmer/ livestock

2. 2000
- Uprooting
- Cultivation
- Mulching
- Application of herbicides
- Slashing

3. 2000 (i) G – Couch grass *(digiteria sealarum)*
H- Sodom Apple *(solanum incarium)*

(ii)
- Compete for resource with cultivated crops
- It increases the cost of crop production
- Lowers the quality of pastures

(iii) It has deep underground structures difficult to remove

4. 2001 Disadvantages of weeds
- Compete for resources with crops
- Increase the cost of crop production
- Some may contaminate the crop lowering the quality.
- Irritate the workers lowering labour efficiency.
- Some weeds are parasitic to crop pests and diseases
- Some weeds are allelopathic.

4.2004:
- Produce large quantities of seeds
- Seeds remain viable for along time
- They have effective mechanisms of dispersal

- Some weeds have the ability to propagate both by seeds and vegetatively.
- They have elaborate root system.
- Some have underground structures difficult to control.
- Some are able to survive with limited nutrients.
- Some are able to compress their life cycle.
- Some weeds are allelopathic.

6.2004:

(i) Thorn apple (*Datura stramonium*)
(ii) Annual weed
(ii) Poisonous if eaten

LAND TENURE AND REFORMS

1. **1997:**
   - Difficult to control pests and diseases/diseases and parasites spread faster.
   - Land disputes are common
   - No motivation to conserve land
   - No motivation to make long term investments
   - An individual cannot use land as security to acquire
   - Difficult to control breeding in livestock.

2. **1999:**
   - Saves time and money
   - Makes it easy to have a sound farm plan e.g rotation programme.
   - Eases soil conservation.
   - Eases supervision as al enterprises are at one place.
   - Facilitate mechanization.

3. **2003:**
   - To settle the landless.
   - To ease population pressure.
   - To increase agricultural production.
   - To improve people's standard of living.

4. **2005:**
   - Communal tenure
   - Co-operative tenure

PESTS AND DISEASE CONTROL

1. **1994:**
   (i) Weaver bird
   (ii)
   - By eating the grains
   - Opening the cab to water that leads to rotting of the grains,

   (iii)
   - Use of scare crows
   - Trapping
   - Use of explosives
   - Use of resistant varieties

2. **1994**: (i) Cutworm/Agrotis
   (ii) Cuts the stern causing lodging.

- Use of appropriate insecticide.
- Removing it and killing it.

3. 1995:

- Its cheap
- Saves on labour.
- Does not cause environmental pollution.

4. 1995:

- Destroy the alternate host
- Practice crop trapping.
- Destroy the crop remains

5. 1996:

- Seed dressing using appropriate chemical.
- Use of resistant varieties
- Practice close season.
- Practice field hygiene/destroy crop residual.

6. 1998:

- Concentration of the pesticide
- Weather condition during and soon after application
- Stage of development of the pest.
- Persistence of the pesticide.
- Formulation of the pesticide.
- Mode of action of the pesticide.

1999: (a)

- Biting and chewing
- Piercing and sucking

(b)

- Store hygiene/ensure store is clean
- Proper drying of grains.
- Ensure store has proper ventilation.
- Keep store airtight.
- Clear the bush around the granary.

8 1999:

- Proper plant nutrition, increase disease resistance/control deficiency diseases.
- Crop rotation breaks life cycle of pathogens
- Rogueing, prevent further spread of the disease.
- Use of disease free planting materials: prevents introduction of pathogens in the field.
- Close season breaks the life cycle of pathogens.
- Timely /early planting; help crop to establish early before attack.
- Proper spacing; creates unfavorable conditions for some pathogens.
- Weed control; eliminate weeds that could be alternate hosts for particular pathogens.
- Resistant varieties; ensure crop is not attacked by the pathogen.
- Use of clean equipment/tools, prevent spreading of the disease from one plant to the other.
- Quarantine; prevent spread of the pathogen from one farm to the other.
- Heat treatment; kills the pathogen.
- Pruning; creates unfavorable microclimate for some pathogens/prevent spread of the disease.
- Destroy crop residue; kills the pathogen.
- Control the vectors, prevent further spread of pathogens.

9. 2003:

- Plant resistant varieties

- Practice crop rotation.
- Practice field hygiene.
- Use of clean planting materials.
- Trim roots of suckers before planting.
- Plant Mexican marigold close to the banana plants.

10. 2003:

(a) Point at which damage on a crop by pest is beyond tolerance and has to be controlled.

(b)

- By contact
- Through ingestion
- By suffocation

(c)

- Pesticides are expensive.
- Pesticides requires special skills to handle. They are poisonous/environmental hazard.
- Some are non-selective/they kill useful organisms.
- Some pest develop resistance to the pesticide.

11.2004:

- Lower the quality of farm produce.
- Lower they yield.
- Increase cost of production
- Some pests are vetors of crop diseases.
- Some pest lower labour efficiency by irritation.

12.2005:

- Early planting
- Roqueing
- Trap cropping

13.2005 :

- Attack by nematodes.
- Root nodules due to nitrogen fixing bacteria.

FIELD PRACTICES (II)

1. **1994:**
   - Field birds; *accept any appropriate example.*
   - Shoot fly;
   - Stem borers.
   - Diseases; Rust, Downy mildew, Ergot, smut
2. **1996:**
   - The crop has well developed roots to absorb the nitrogen before it can be lost
   - Maize is growing fast and requires a lot of nitrogen.
3. **1996:** Head smut/smut
4. **1996:**
   - Putting rat guards/ ensures granary is vermin proof.
   - Ensure store is clean.
   - Clear the vegetation around the granary.
   - Harvest the grains on time to prevent attack in the field.
   - Proper drying of grains.
   - Use rat traps
   - Use of cats.

5. **1996:**
   - Weevils,
   - Flour beetles,
   - Lesser grain borer;
   - Greater grain borer;
   - Khapra beetle;
   - Warehouse moth;
   - Saw toothed grain beetle;
   - Angoumois grain moth.
6. **1996**

   (i) K, G, H, J

   (ii) Failure of boll to develop

   (iii)
   - Do not pick the lint when it is wet
   - Pick on weekly bases
   - Avoid dry twigs or leaves contaminating the cotton
   - Do not use sisal bags to hold cotton as the sisal fibres may contaminate lint,

   (iv)
   - Cotton lint
   - Cotton seed

6. 1997
- Early/ timely planting
- Practice crop rotation
- Practice field hygiene
- Destroy crop residue
- Practice rogueing
- Use healthy / certified seeds
- Practice close season
- Use appropriate pesticide to control the vector
- Uproot volunteer crop

7. 1998 (i)
- Field hygiene/ destroy crop residue/ rogueing
- Use of trap crop
- Destroy alternate host/ weeds
- Timely harvesting

  (ii)
- Stalk borers
- Armyworms
- Aphids
- Dusty brown beetles
- Weevils
- Termites
- Locusts
- Leaf hoppers/ grasshoppers
- Cystic beetle
- Great/ lesser grain borer; cut worms
- American bollworms

9. 2000
- Uprooting weeds cultivation
- Mulching; t application of herbicides

- Slashing/ cutting the weeds

10. 2000

- Control the vector
- Use certified seeds
- Use of resistant varieties
- Practice field hygiene
- Early planting
- Roqueing
- Practice close season

FORAGE CROPS

1. 1994/ 1995

- Mixed pasture is more nutritious
- Economies on nitrogenous fertilizers by N- fixation
- There's higher yield per unit area
- There is security incase of failure of one crop
- It provides a good soil cover hence control erosion
- There is maximum utilization of soil nutrients

3. 1996

- Leads to exhaustion of pasture crop
- May lead to high incidence of parasites and diseases
- Leads to soil erosion

4. 1997

- To raise the carbohydrate level for proper fermentation
- To increase the nutrient level of silage
- To increase the palatability of silage
- To restrict growth of undesirable microorganisms

4. 1997 (a)

(i) Under- sowing is the establishment of a pasture crop under a nurse crop

(ii) Over- sowing is the establishment of a high quality pasture crop on an existing grass pasture

(b)

- Slashing/ moving
- Uprooting
- Use of selective herbicides

(c)

- Replenish soil nutrients
- Hasten growth/ increase herbage yield
- Improve the nutritive value of the crop
- Amend soil physical and chemical properties
- Enhance decomposition of organic matter by micro- organism/ increase microbial activity

5. 1998

- Rotational grazing/ controlled grazing
- Proper stocking rate
- Conserve excess pasture

- Timely defoliation
- Practice zero grazing
- Graze different classes/ species of animals

6. 1999/2004

- Stage of growth at harvesting time
- Species of the forage crop used
- Duration of storage
- Soil fertility where the crop was grown
- Weather conditions during drying
- Length of drying period
- Pest/ disease attack on the crop
- Method of storage

8. 2000

- There is intensive/ efficient use of land
- Reduces the cost of forage production
- Control soil erosion due to ground cover
- Ensure early pasture establishment

8. 2003 (i) Seedbed preparation

- Practice early seedbed preparation/ during the dry period
- Clear all the vegetation/ stumps
- Carry out primary tillage
- Dig deeply to remove all weeds/ perennial weeds
- Carry out secondary tillage
- Seedbed should have a medium tilth
- Prepare furrow/ holes for planting
- Spacing between furrows 90- 100cm for cuttings/ 90 – 100cm x 50cm for splits

(ii) Planting

- Plant at the onset of the rains/ early planting
- Select desirable Napier grass variety for the ecology of the area
- Use healthy planting materials
- Use cuttings/ canes or splits for planting
- Cutting/ canes should have 3-5 nodes
- Select cutting from mature canes/ stems
- Place planting materials in the furrows/ holes
- Cover the material with soil to the appropriate depth

(iii) Fertilizer application

- Apply phosphate fertilizer at planting
- Apply farm yard manure/ composite manure before planting
- Rate of organic manure should be 7 – 10 tons/ ha
- Apply organic manure after harvesting and dig it into the soil every year
- Top dress with Nitrogen and potassium 6-8 weeks after planting

(iv) Weed control

- Control weeds by; cultivation, uprooting, slashing, selective/ appropriate herbicides, intercropping with legumes that smoother or the weeds
- Practice timely weed control

(v) Utilization

- Cut and feed it to ruminants.
- Defoliate/ cut at the right stage of growth/ 3 - 5 months old/ when stems are 1 – 1.5 m high
- Cut the stems at 2.5 – 5 cm above the ground surface
- Use sharp panga for cutting
- Conserve excess as silage

- Chop Napier grass into small pieces before feeding
- Napier grass can be dried and used as mulch

9. 2004 (a) Lucerne, silver/ green leaf, desmodium siratro, stylo

(b)

- Reduce build- up of parasites and diseases
- Animal waste is evenly distributed in the fields
- Excess pastures can be conserved
- It is easy to carryout management practice
- Pasture is given time to regenerate
- Pasture is maximally utilized

(c)

- Sprinkling some water
- Reduce compaction
- Fill the silo and seal it from air rapidly

10. 2005

- Control soil erosion
- Ensure adequate pasture for animals
- Increases the useful life of the pasture crop

11. 2005 (a) Practice of coating legume seeds with a nitro- culture/ rhizobium bacteria

(b) Growing a legume pastures over an existing grass pasture

LIVESTOCK HEALTH (III)

1. **1994** Oral (mouth), broken skin (wounds), nasal, ocular (eyes), anal, ears, reproductive organs, umbilical cord
2. **1995**
   - Routine vaccination
   - Slaughtering all infected animals
   - Impose quarantine
   - Treatment of wounds
3. **1996/2004**
   - Difficult in breathing/ respiratory problem
   - Dullness/ birds stands with eyes closed
   - Anorexia/ loss of appetite
   - Nasal discharge
   - Sneezing
   - Droopy wings
   - Yellow/ greenish watery diarrhoea
   - Drop in production
   - Soft- shelled eggs
   - Torticolis/ bending of neck

4. 1996

- Wounds on the udder/ teats
- High milk production
- Very old cows
- Unhygienic handling of the cow
- Poor udder placement/ pendulous udder
- Incomplete milking
- Genetic factors
- Early and late lactation period
- Poor milking technique

5. 1996

- Blood/ pus in milk
- Painful udder/ teat/ animal kicks when teats are touched
- Swollen/ inflamed udder
- Clots/ thick milk
- Watery milk
- Blocked teat canals
- Drop in milk production
- Foyer

6. 1997

- Anthrax
- Rinderpest
- Foot and mouth
- Lumpy skin disease

7. 1996/ 2004

- Routine vaccination
- Isolate infected birds/ kill all infected birds
- Disinfect the poultry house before introducing a new stock
- Obtain chicks from reliable sources
- Imposition of quarantine

8. 1997 (i) Fowl pox

- May lead to death of the birds
- Farmer incur extra expenses in its control

(ii)

- Kill and dispose off all infected birds
- Routine vaccination
- Control biting parasites
- Treat wounds

9. 1999

- Wounds in infected hooves
- Foul smell from infected hooves
- Spend most of the time lying if both hind legs are infected
- Grazes when kneeling it fore legs are infected
- Loss of appetite
- Lameness/ limping
- Swelling of infected hooves
- Emaciation

10. 2000 (i) Protozoa/ coccidiax/ Eimeria species

(ii) Bacterium/ clostridium spp/ clostridium chauvei

11. 2000 (i)

- Long hooves
- Damp environment/ poor hygiene
- Injury on hooves

(ii)

- Anaemia
- Fever
- Constipation
- Lack of appetite/ anorexia
- Inability to move
- Reduced milk production
- Animal becomes aggressive

12. 2000
- General farm hygiene to kill the pathogens
- Isolate sick animals to prevent spread of the disease
- Deworm the animals to control endo–parasite
- Treat the sick animals to prevent spread of the disease
- Vaccinate the animals to develop resistance against disease attack
- Control vectors to prevent spread of the disease
- Routine administration of drugs/ prophylaxis to prevent infection
- Proper feeding to prevent deficiency / nutritional diseases
- Mass slaughter of infected animals to prevent spread of diseases
- Proper selection and breeding to control breeding and inheritable diseases
- Proper housing to avoid predisposing animal to diseases
- Foot trimming to minimize occurrence of foot rot disease
- Imposition of quarantine to prevent spread of diseases

13. 2001
- Lack of stiffness of the carcass/ lack of rigor mortis
- Production of tar- like watery blood from all body openings
- Extensive bloating

14. 2001 (a) Bacterium/ *Brucella abortus*

(b)
- Spontaneous abortion/ premature birth
- Retention of after birth abortion
- Bareness
- Yellowish brown slimy odourless discharge from the vulva

(c)
- Use artificial insemination
- Cull infected animals
- Vaccinate all young animal
- Avoid direct contact with aborted foetus/ after birth
- Observe hygiene/ proper disposal of aborted foetus

15. 2002
- Routine vaccination
- Improve quarantine
- Kill and dispose off infected animals
- Isolate sick animals
- Disinfect the animal house

16. 2004/ 2005
- Swollen lymph nodes
- High fever
- Profuse salivation
- Lachrymation/ production of tear
- Difficulty in breathing
- Bleeding in the vulva and mouth
- Coughing

17. 2005 (a) Deficiency of calcium in the wood of the cow
- Muscular twitching
- Staggering as the animal moves
- Animal become unconscious
- Loss of appetite
- Cessation of body functions
- Dullness

- Animal lies with the neck twisted for the head to lie on the shoulder

(c)

- Feed animal with diet rich in calcium
- Partial milking
- Intravenous injection with calcium salts/ calcium borogluconate

POULTRY PRODUCTION

1. 1995

- Debeaking
- Making laying boxes/ nests dark
- Feeding on balanced diet
- Hanging green vegetation to keep birds busy scatter grains on the floor
- Isolating and treating cannibalized birds
- Control external parasites
- Keeping birds according to age/ avoid introducing new birds
- Provide adequate space

2. 1995

- Size/ weight/ volume of egg
- Colour
- Cleanliness
- Shell quality e.g. broken, rough
- Shape of the egg

3. 1998 (a)

- Ensure brooder corners are rounded
- Provide enough brooding space accordingly. Clean and disinfect the brooder house/ equipment.
- Provide wood shavings/ proper litter on the floor
- Maintain appropriate temperature range according to the age of the chicks
- Temperature during the 1st one week should be $32 - 35^0$ c, then reduce accordingly
- Spread sheets of papers and sprinkle chick mash on them
- Provide fire guard around the heat source
- Maintain proper ventilation by adjusting the openings
- Provide fresh, adequate and qualify feed/ chick mash
- Provide brooder with reliable and appropriate lighting/ dim light
- Provide adequate and appropriate waters/ feeders according to age/ number of chicks
- Remove dead chicks from the brooder
- Control parasites by applying appropriate pesticides
- Control diseases appropriately
- Isolate and treat sick chicks immediately
- Keep proper records
- Gradually change the feed in the last one week in the brooder
- Debeak 8 – 10 days towards the end of brooding
- Provide adequate clean water all the time

(b)

- Combs and wattles are small, dry and cold/ combs have white scales
- The space between the pelvic bones is narrow 2-3 fingers cannot fit in the space between the pelvic bones
- Plumage is shiny, well preened/ sometimes moulting
- Yellowish pigmentation in the vent, shanks and beak
- Space between the keel bone and pelvic bone is small / 3-4 fingers cannot fit in the space

- Eyes are dull and yellow
- Abdomen is hard
- The layer is lazy and dull
- Hen becomes broody

4. 1999

- Repair/ replace broken parts of the house
- Maintain a footbath at the door of the deep litter
- Clean and remove any dirt/ cob webs
- Fumigate against pests and diseases/ spraying/ dusting
- Paint some parts of the house/ apply old

5. 2000

- Dirt
- Abnormal size/ undersize/ oversize
- Irregular/ broken/ soft shell
- Internal abnormalities e.g. double yolk, meat spots, poor candling qualities
- Poor storage/ long storage beyond 5 days

6. 2001

- Ensure laying nets are dimly lit
- Provide adequate laying nests
- Debeak perpetual egg eaters
- Collect eggs regularly and frequently
- Ensure birds get a balanced diet
- Keep birds busy by hanging green vegetation in the house/ scatter grains on the liner.

7. 2002. (a)

- Chicks move away from heat source
- Parting/ opening beaks
- Opening the wings/ spreading wings
- Making abnormal noise
- Drinking water excessively
- Chicks may lie flat on their bellies

(b)

- Requires less space/ high stocking rate
- Less toss of eggs
- Easier collection of manure/ easier accumulation of manure
- Easier protection of birds from vermin's/ parasites/ diseases
- Less labour requirement/ easier to collect eggs/ easy handling
- Cheaper to set up than battery cage/ low initial cost

8. 2005

- Should be fertilized
- Should be medium in size
- Should be oval in shape
- Should not be cracked
- Should de dean
- Should be free from abnormalities/ blood spots/ meat spots/ double yolk
- Should be 5 – 10 days old
- Should have smooth shell

9. 2005

- Regularly wash and disinfect the feeders/ waterers/ perches
- Replace old wet litter/ turn litter regularly
- Control visitors into poultry house/ use of footbath before entering the house
- Avoid pouring water on the litter/ avoid dampness

- Isolate sick birds
- Treat sick birds
- Dispose of dead birds immediately

LIVESTOCK PRODUCTION (vi)

1. 1995 (a)

K- Alveolus
L- Gland cistern
M – Teat cistern
N – Teat

(b)

(i) Milk let down is the flow of milk from the upper/ alveolar region of the udder to the gland and teat cisterns

(ii) Oxytocin

(c)

- Practice farm hygiene/ milk infested cows last/ use a separate udder towel for each cow/ use disposable udder towel
- Immediate treatment of infected cows to avoid spread of the diseases/ treat any wounds on the teat/ udder
- Practice teat dips after milking
- Applying milk salve/ jelly to prevent drying and cracking of teats
- Practice good milking techniques

2. 1995

- Ensure calf is breathing/ administer artificial respiration.
- Clean mucus from the calf/ ensure cow licks the calf dry
- Cut and disinfect the umbilical cord
- Ensure calf sucks colostrums from the mother within the first 8 hours
- Feed the calf on colostrums for the first 4 days
- Keep records on the performance of the calf, introduce whole milk or milk replacer after the 4^{th} day.
- Feed the calf with warm milk at regular intervals
- Feed the calf 2-3 times per day for the first 1 – 4 weeks
- Feed the correct amount of milk up to weaning
- Observe strict hygiene in calf
- Protect the calf against adverse weather conditions by providing proper housing
- Provide adequate clean water from the 3^{rd} week
- Introduce palatable dry fed e.g. concentrates and good quality grass/ mineral salts from the 3^{rd} week
- Keep calf in individual pens until it is 3-4 months old
- Spray / dip calf against external parasites
- Drench deworm calf against internal parasites
- Vaccinate the calf against prevalent diseases
- Release the calf from the pen occasionally for exercises
- Wean calf at 8 weeks/ 16 weeks
- Deworm the calf using appropriate methods
- Graze calf on good quality pastures ahead of adult cows
- Separate heifer calves at puberty to avoid in breeding
- Weigh the calf regularly
- Treat sick calves
- Put appropriate identification

- Defeat if necessary
- Change in feed be done gradually
- Serve at the right age/ weight/ 15 – 20 months/ 250- 280 kg

3. 1997 (a)

- Should be clean/ free from physical contamination
- Has the right consistency/ no water added/ true to the breed
- No strange odours/ no foul smell
- Free from diseases causing organisms
- White in colour/ normal colour/ not tainted
- Normal taste/ flavour

(b)

- The calf can be reared artificially even if a mother dies during birth
- Many calves can be reared at a time
- The calf can be given correct amount of milk
- It is possible to keep clear records on milk
- Yield

4. 1998

- Free from diseases causing organisms
- Free from dirt/ foreign materials
- Appropriate smell and flavour
- Chemical composition within the expected standards

5. 1999

(a) The milk secreted by the mammary glands within the first week of lactation/ thick yellow milk secreted by the mammary glands within the first week after parturition.

(b)

- Has a laxative and helps to remove the faecal meconium/ first faecal matter/ opens up the alimentary canal/ cleanse the digestive system/ prevent constipation
- It is rich in antibiotics that offers temporary immunity against diseases
- It is rich digestible proteins/ fats/ minerals/ vitamin/ highly nutritious
- It is highly digestible

(c) Bucket feeding/ bottle feeding/ artificial method. Dam suckling the calf/ calf sucks the dam/ natural method

6. 2000

- The milk person should be clean
- Test for mastitis before milking
- Milk person should be healthy
- Ensure utensils/ equipment are clean
- Ensure milking parlour is clean
- Ensure milking heard is free from zoonotic disease e.g. TB
- Cows with mastitis should be milked last
- Clean the udder
- Sieve the milk
- Cover the milk
- Avoid feeds/ weeds that would taint the milk just before milking
- Proper storage of milk/ cool, dry place.

7. 2001

- Clean mucus from calf soon after birth/ ensure cow licks dry
- Ensure calf is breathing / administer artificial respiration

- Cut and disinfect the umbilical cord. Ensure calf sucks the mother to get colostrums, within the first 8 hours
- Feed the calf on colostrums for the first 4 days. Introduce whole milk/ milk replacer after 4 days
- Feed the calf with milk at body temperature
- Weigh the calf regularly
- Provide adequate clean water
- Introduce palatable solid feed e.g. concentrates, good quality grass from 3rd week
- Put appropriate identification marks
- Treat calf if sick
- Castrate male calf
- Provide proper housing for calf
- Keep calf individually up to the weaning time
- Control external parasite with appropriate method/ spray/ dip
- Drench/ deworm to control internal parasites
- Observe hygiene
- Remove extra teats
- Dehorn/ disband using appropriate method
- Release calf occasionally for exercises
- Keep records on calf performance
- Wean calf at 8 weeks/ 16 weeks
- Reduce amount of milk gradually towards weaning
- Train calf to take milk from a bucket.

FARM POWER AND MACHINERY

1. 1995 (a)

- It makes farm operations timely/ faster
- Economizes on labour
- Work is done more efficiently
- Reduces drudgery/ can accomplish heavy task
- Cheaper per unit work done in large
- Operations

(b)

- Turns/ inverts the furrow slices thus covering surface vegetation
- Cuts the furrow slice horizontally
- Holds the frame on to the mould board land side and share
- Absorbs thrust exerted on the mould board to make the plough stable

(c)

- Always clean after use
- Check the nuts and bolts and tighten if loose
- Repair broken parts
- Replace worn out parts/ lost parts
- Proper storage

2. 1995

- Reciprocating mower/ cuter bar mower
- Power take – off shaft
- Sharpen the cutting blades
- Tighten loose nuts and bolts
- Lubricate moving parts
- Repair broken parts
- Replace worn- out parts

- Clean after a days work
- Check the tension of the v- belt and adjust accordingly
- Coat with old engine oil for long storage

3. 1996 (a)

- Ox- drawn mould board is lighter hence does not compact the soil as much as the tractor – drawn mould board plough
- Ox – plough can be use for more farm operations e.g. weeding, ploughing harvesting roots crops than tractors mould board.
- Ox- plough requires less skills to operate compared to the tractor plough
- Tractor plough is faster than ox- plough hence can plough a large area with a short time
- Source of power for ox- plough is not as reliable as the source of power for tractor plough
- Ox- plough relatively shallow compared to tractor plough that plough deeper
- Ox- plough can be used in steeper lands where tractor plough cannot plough
- Ox- plough requires more people to operate than tractor plough
- Ox - plough is cheaper to buy than tractor plough
- Ox - plough is cheaper to maintain than tractor plough

(b)

- Grease the moving parts (rej movable parts)
- Paint frame/ oil before long storage
- Tighten loose nuts and bolts
- Clean it after work
- Store in a shed
- Repair damage parts
- Replace worn- out parts

(c) **Advantages**

- It is cheaper
- Farmer does not incur maintenance costs of the tractor
- There is no risk of owing the tractor
- Farm operations are carried out faster

Disadvantages

- Tractor may not be available when required
- Some operators may charge high fees for the service
- Some operators can carry out poor quality work

4. 1997 (a)

- To reduce wear and tear/ increase durability
- Avoid rusting

(b)

- Sharpen blades if blunt
- Replace worn – outs parts
- Clean the mower after use
- Tighten loose nuts and bolts
- Repair worn- out guard
- Paint when necessary
- Proper storage in shed

(c)

- Size of land
- Cost of the tractor
- Availability of services facilities/ availability of skilled labour e.g drivers, mechanics, spare parts
- Topography of the land

- Time available for the operation
- Availability of capital
- Number/ type of enterprises on the farm
- Availability of tractor hire services/ availability of other sources of power

5. 1999 (a)

- Incorporating manure into the soil/ stirring the soil
- Breaking soil clods
- Leveling the seed bed
- Covering broadcasted seeds
- Gathering/ removing trash

(b)

- Clean after use
- Store in a shed
- Repair/ replace any broken tine/ part
- Apply oil for long storage

(c)

- Ox- drawn harrow is cheaper than a tractor- drawn harrow
- Ox – drawn harrow can be used where tractor drawn harrows cannot be used

6. 2000

- Clean after work storing in a shed
- Tighten loose nuts
- Replacing worn- out parts
- Greasing moving parts
- Oiling/ painting for long storage

7. 2001 (a)

- Decrease the angle of cut
- Use of hydraulic/ draught control lever
- Adding weights on the plough beam
- Raising the land wheel

(b)

- To avoid injury
- To make disc plough last longer
- To make disc plough work efficiently
- To reduce replacement/ maintenance cost

(c)

- Saves time
- Improves efficiency
- Saves on labour cost
- Reduces drudgery/ less tedious

8. 2003 (a)

- To make a vertical cut into the soil that separate the furrow slice from the unploughed land
- Cut trash which would prevent the share from penetrating deep into the soil

(b)

- Lubricate moving parts
- Adjust the tyre pressure
- Replace worn-out tyres
- Tighten loose nuts and bolts
- Proper storage/ in shed
- Clean after use
- Paint the trailer
- Repair broken parts

9. 2004

- Poor quality work unless under strict supervision/ poor skill of the operator
- Not readily available leading to late land
- Preparation
- Disc harrow
- Spring tine harrow/ rigid tine harrow/ ox- tine harrow
- Spike toothed harrow/ peg toothed harrow
- Chain harrow
- Rotavator
- Zigzag harrows

10. 2005 (a)

- If a farmer has inadequate capital
- If a farmer has little load to carry
- If the area is too steep to use a tractor

(b)

- Tighten loose nuts and bolts
- Straighten bent/ repair worn out/ broken parts
- Store in a dry place
- Apply oil on exposed metal parts when plough is not in use
- Repaint the appropriate parts when necessary

AGRICULTURE ECONOMIC III

1. 1995 (a)

- Training the labour force
- Giving incentives to employees
- Efficient supervision of labour
- Assigning specific tasks to workers
- Proper remuneration of a worker
- Provide efficient tools
- Mechanization of some operations
- Provide transport within the farm

(b)

This is the production in which each addition unit of input results to a larger increase in output than the proceeding unit of input

(c)

- Short term credit
- Medium term credit
- Long term credit

2. 1996 (a)

Opportunity cost is the value of foregone best alternative/ revenue foregone because of choosing the best alternative

(b)

Refers to the raw materials used up in the process of production, e.g. seeds, fuel fertilizer, feeds

(c)

Utility is the satisfaction one gets by using a commodity

3. 1997 (a)

- Borrowing from financial institutions/ individuals co-operative/ credit
- Person savings from ones income
- Inheritance/ gifts/ donations

(b)

- Assists the farmer in estimation of the required production resources
- Assists the framer when negotiating for farm credit
- Assist the farmer in making management decisions when comparing alternative projects
- Help to reduce uncertainty in farming process
- Encouraging farmers to efficient as to meet the projected targets
- Show progress/ lack of progress in the farm business/ focus profit or foresee losses

4. 1998 (a) Fixed costs are those that do not change with the level of production while variables costs are those that change with level of production

(b)

- Casual labour costs
- Fertilizer/ manure costs
- Costs of chemicals
- Cost of fuel
- Costs of repair of machinery
- Cost of hiring machinery

(c)

- Planning helps in selection of the best enterprise/ production option to undertake
- Helps in setting production targets/ goals
- Helps in allocation of resources to various enterprises
- Helps to identify the weakness and strength of farm operations
- Helps in timely and careful considerations in decision making
- Assists in negotiation of credit
- Maximize use of resources

5. 1999

- To compare the performance of one farm with another
- To compare the performance of the farm between one season and another
- To compare the contribution of one enterprise and another on the same farm
- Acts as a measure of profit in a farm

6. 1999 (a)

- Zone I. For each addition unit of fertilizer applied, the output of potatoes increases at an increasing rate because resources are under utilized
- Zone II. For each additional unit of fertilizer applied, the out put of potatoes increases at a decreasing rate as the resources are utilized to the maximum
- Zone III. For each additional unit of fertilizer applied the out put of potatoes decreases since the resource is excessively applied.

(b) Zone II

(c)

- Flexibility in production.
- Produce under contract
- Input rationing/appropriate allocation of resource input.
- Insurance of the crop.
- Use of modern technology e.g. disease resistant varieties,
- Use of pesticides and fungicides, use of fertilizers.

7. 2002: (a)

- Training/ educating labour force
- Mechanizing farm operations/proper working tools.
- Giving incentive/proper housing/transport bonuses.
- Supervision of labour
- Assign specific tasks to workers.

- Proper remuneration
- Assigning tasks according to skills/ability/interest.

(b)

- Improvement in quality of work/quality of produce.
- Reduced time of performing a given work.
- Increase in returns per unit of labour.

(c)

- Amount of work/ task performed e.g. kg of tea leaves picked per head.
- Duration of work e.g. 30/= per hour/day.
- Labour regulations/market rates
- Nature of work
- Quality of work/skill of labour

8.2001:

- Amount of money to be paid to them as wages.
- Number of people in the labour market
- Health /fitness of the work force
- Ability/skills of the labour force
- Working conditions/incentives
- Nature of work

(b)

- Adopting modern methods of production
- Flexibility in production methods
- Input rationing
- Taking insurance cover
- Selecting more reliable enterprises
- Diversification.

(c)

- Provides employment
- Source of food
- Earns the country foreign exchange
- Source-of raw materials for industries
- Provide market for industrial goods
- Source of income for farmers
- Improves infrastructure relationship.

9.20002

- Maximize profit
- To maximize cost of production
- To spread/ reduce risks

10.2 2003(a)

- Milk and butter
- Beef and hide
- Honey and wax
- Mutton and wool
- Pork/bacon and bristles
- Rabbit meat and skin/pelts
- Mutton and skin

(b)

- Feeds
- Pesticide
- Replacement stock
- Veterinary services

- Drugs
- Casual labour
- Packing materials e.g trays and carton boxes

(c)

(i) $V=\frac{48-39}{2-1} = 9$

$W= \frac{32-27}{4-3} = 5$

$X=\frac{23-21}{6-5} =2$

$Y= \frac{20-19}{8-7} =1$

L.C.C occurs where MRS =

L.C.C. $\frac{X1}{PX2}$

Where Δ= change

P= price

X_1= dairy meal

X_2= Home made feed

$\frac{8}{2}= 4$

L.C.C. is where MRS = 4 I.E where 5 units of dairy meals are mixed with 23 units of home made feed.

11. 2004: (a)

- Joint products
- Competitive products
- Supplementary products
- Complimentary products

b) (i) Production function is the physical relationship between inputs and output (products). The quantity of product expected from a certain-combination of in put.

(ii) Equi-marginal returns states that limited amounts of resources should be allocated in such away that the marginal returns those resources is the same in all alternative to which they are put.

12. 2005:

- Crop boards/marketing board/statutory boards.
- Commercial banks
- Cooperative societies
- Agricultural finance corporation (A.F.C)
- Settlement fund trustees
- Private money lenders/Non –Governmental Organizations (NGOS) insurance companies/ Hire purchase companies.

13 2005: a)

- Costs of feeds
- Wages casual labour
- Cost of pesticide / chemicals/drugs
- Cost of insemination services

b)

- depreciation of machinery /buildings
- Land rent
- Salaries of regular/permanent labour
- Interest on borrowed capital

14 2005 (a)

- Partial budget is prepared when minor changes are to be made in an enterprise
- Complete budget is spread when major changes are to be made in an enterprise/ starting arrow enterprise.

b)

- Diversification of enterprises to avoid total loss
- Insurance against tosses to maintain high liquidity/for compensation /to access money easily for any eventuality.
- Strategic farming/keeping crops produce and selling when prices are high.
- Flexible enterprises-engage in enterprises that can be stopped and changed
- Rationing of inputs use of insufficient inputs such that incase of failure losses are not too high.
- Contracting for marketing-making arrangements with marketing agencies in advance.
- Selection of more certain enterprises/ selection of enterprises that can do well in an area/section of enterprises with ready market and less price fluctuation to reduce degree of risk.

AGRICULTURE ECONOMICS- FARM INPUTS

1. 1996 (a)

- Journal
- Cash book
- Ledger
- Inventory

b)

- Shows the assets and liabilities of the farm business,
- Shows farm net worth/net capital/ owners worth/ can be used to negotiate for credit/correct income tax assessment,
- Used in decision making;
- Show profit or loss.

AGRICULTURAL ECONOMICS (MARKETING & ORGANIZATION)

1. **1995:** -Ten members

(b)

- Number of sellers
- Price of the commodity
- Availability/ seasonally of the commodity / weather.
- Technique of production
- Market information
- Transportation
- Price expectations of the commodity.
- Government policy/taxation.

(c)

- Price fluctuations/ low prices
- Lack of transportation.
- perish ability of some products

- poor storage facilities.
- Competition with substitute products.
- Delayed payments
- Some government policy

(d)

- Kenya Planters Co-operative Union
- Coffee Board of Kenya.

2. 1996

a) Marketing is the performed of business activities that direct the flow of goods and services from producers to consumers.

b) An imperfect market is g situation in which some buyers, some setters or both have limited knowledge of goods and services offered for sale at various prices.

c) The price of mangoes will go down.

(d)

- Milk is highly perishable we hence needs cool storage which the farmer may not afford.
- Lack of vehicles/poor roads/high transportation costs
- Containers for handling milk are expensive.
- Lack of market information
- Price fluctuation.
- Delayed payments.

3. 1997

a) The quantity of the product demanded varies inversely with the price 7 as the price declines the corresponding quantity demanded rises and as the price increases the corresponding quantity demanded falls. (Mark as a whole)

- Advertisements/ sales promotions
- Price of related goods, price of the goods,
- Level of income
- Price expectations
- Tastes and preferences.
- Tastes and preferences
- Population,
- Religious beliefs / taboos.

(c)

- Elasticity of demand of a commodity is the percentage in quantity demanded of a commodity resulting from a percentage change in existing price.
- The degree of responsiveness of quantity demanded, to a- percentage change in existing price.
- Buy farmers produce / delegates buying to an approved agent
- Arrange for supply of inputs.
- Fix prices of farm produce in consultation with the government.
- Collect farm produce from areas of production to the stores/factories.
- Inspect the production process to ensure and maintain quality of the produce.
- Provide storage facilities for farmers produce.
- Provide credits to farmers,
- Provide technical advice on production/extension services where applicable
- Process farm produce e.g. K.T.D.A.
- Undertake research services on techniques of production
- Sell farm produce for farmers
- Regulate production to prevent under supply of the produce.
- Pack/package the farm produce.
- Invest accrues profits.

- Advertise/promote sales of the produce.

4. 1998

- Members buy inputs at lower prices.
- Has easy access to credit facilities from the society.
- Gets advice/education from the society.
- Society share overhead costs with the member.
- Society share overhead costs with the member.
- Provide special services e.g. A.I, Banking
- Bar society bargains for better milk price on behalf of the member.

5. 1999

(i) Most agricultural produce are perishable hence, farmers incur extra costs in transportation-processing/storage/incur losses due to spoilage.

- Most of them are bulky, occupy large space/expensive to transport.
- Poor transport network/lack of vehicles lead to loss due to spoilage.
- Most of them are seasonal; hence create storage problems/over supply at times leading to price fluctuation.
- Due to bulkiness they are expensive to store/difficult to store.
- Due to changes in market demand, there is time e.g. between decision to produce and actual availability of the product making it difficult to respond immediately to market demand.
- Change in supply due to under/over production/competition from cheap imports cause price fluctuation.
- Lack of perfect market information makes selling difficult/many farmers are ignorant on the prevailing prices of their produce in other parts of the country.
- Delayed payments lead to lack of capital for farm operations.

(b)

- Itinerant traders/ middlemen buy and resell produce from farmers.
- Processors / Manufacturers buy and process produce from farmers.
- Wholesalers- Buy produce in bulk from farmers and resell/ process.
- Brokers / Commission agents- acts on behalf of other business people for a fee commission.
- Co-operative societies/ unions- buy farmers produce locally.
- Marketing boards- promote production and marketing of agricultural produce/buy produce from farmers.
- Retailers- buy from wholesalers and resell to consumers.

6. 2000:

- Price of related commodity.
- Price of the commodity.
- Size of population of consumers,
- Tastes and preference of consumers.
- Income of consumers.
- Advertisements/sales promotion
- Government policy
- Price expectations.
- Religious beliefs/religious taboos/ cultural beliefs.

7. 2003

Elasticity of demand = $\frac{\% \Delta \text{ in quantity}}{\% \Delta \text{ in price}}$

Δ in price quantity = 22-20 = bags

$\% \Delta$ in price => $\frac{22-20}{}$ = 10%

20

Δ in price =. 100-800 = 200/=

% Δ in price $\frac{200 \times 100}{1000}$ = 20%

Elasticity of demand = $\frac{10\%}{20\%}$ = 0.5

8. 2003 (a)

- Carrying out advertisement of the farm to increase demand
- Finance agricultural activities.
- Transportation of farm produce to areas of consumption.
- Storage of farm produce to minimize losses/ as a marketing strategy.
- Selling the produce on behalf of the farmers.
- Packing/package farm produce to ease transport/ reduce storage space.
- Grade farm produce to provide uniform standards/ cater for various consumers.
- Process farm produce from areas of production for bulking/ transportation
- Protect the farm produce from damage by use of chemicals/ insurance/ bear risks.
- Buy from produce from the producers.
- Gather, analyze and interpret market information to determine appropriate market and price.

b)

- Co-operators pool their resources together to buy expensive machinery e.g tractor for use by farmers.
- Provide education/technical information to members.
- Provide credits to members inform of inputs and cash.
- Negotiate for higher produce prices for members.
- Reduce overhead costs e.g transportation, storage and use of machinery.
- Bargain with suppliers to give discount on seed fertilizer and other farm inputs /provide inputs at lower prices.
- Provide employment for their members and other people.
- Benefits farmers from lower taxes charged
- Market farmers produce.
- Provide strong bargaining power for members on policy issues.
- Invests and pay dividends to members.
- Help to negotiate loans for their members without security.
- Provides banking services to it's members.

9. 2004:

- Perishability of the produce.
- Inadequate supply to spread supply over a long period.
- Drastic changes in supply/seasonality.
- Poor infrastructure e.g. poor roads no vehicles/piped water/ telephone / electricity,
- Bulkiness
- Lack of market information,
- Delayed payments.

2. 1998

Mr. Rambo's farm balance sheet as at 31-12-95

ASSETS			LIABILITIES		
	Kshs	Cts		Kshs	Cts
Fixed Asset			Long term Liabilities		
Buildings and structures	60000		Loan payable Dank	300,000	-
Five cows	250,000	=			=
400 layer	80,000	=			=

20 goats	30,000	=			=
Spray equipment	12,000	=			=
TOTAL	972,000				
Current Assets			Current Liabilities		
Cattle feeds in store	10,000		Debts to co-p	20,000	=
Animal drugs in store	4,000	=	Bonus payable to workers	19,000	
Debts receivable	18,000	=	Breakages and repair	30,000	-
Cash at hand	20,000	=			
Cash at bank	30,000	-			
Total Total Assets	82,000 1,054000	=	Total Total liabilities Capital	69,000 369,000 685,000	=
TOTAL	1054,000		TOTAL	1054,000	
ASSETS			LIABILITIES		
	Kshs	Cts		Kshs	Cts
Fixed Asset			Long term Liabilities		
Buildings and structures	600000		Loan payable dank	300,000	-
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Cash at hand	20,000	=			
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Total Total Assets	82,000 1,054000	=	Total Total liabilities Capital	69,000 369,000 685,000	=
TOTAL	1054,000		TOTAL	1054,000	

3.2001

(a) **Cash account**; is a record that shows all cash receipts and payments,

Ledger: This is a financial book that shows all financial transactions in the farm business in a summarized form,

Balance sheet: This is a financial statement that shows the value of assets and liabilities of a business at the end of an accounting period.

Purchase order. This is a financial document drawn by a buyer to a supplier requested goods on credit.

(b)

- Permanent goods inventor
- Consumable goods inventory.

5. 2004

PROFIT AND LOSS ACCOUNT FOR MRS. MBUTA'S FARM FOR THE YEAR ENDED 31-12-03			
PURCHASES AND	Shs. Cts	SALES AND RECEIPTS	Kshs. Ct

EXPENSES		(CREDITS)	
Opening valuation	6,000.00	Pig sales	7,000.00
Wages	5,000.00	Piglet sales	4,000.00
Equipment	8,000.00	Maize sales	3,000.00
Pig feeds	4,000.00	Closing valuation	4,000.00
Drugs	3,200.00		
		Total	18,000.00
		Loss	8,200.00
TOTAL	26,200,00		2,600.00

Marks allocation

(i) Correct columns (sales & receipts) ½ mk
(ii) Purchases & expenses ½ mk
(iii) Correct entries – Sales & receipts – ½ mk
Purchases & expenses – ½ mk
(iv) Correct totals – sales & receipts – ½ mk
(v) Purchases & expenses – ½ mk
(vi) Correct balance / profit/ loss ½ mk
3 ½ mk
(vii) Mrs. Mbuta made loss

6. 2005 (a) it is an entry in a financial statement showing the worth of all assets of an enterprise at the beginning of an accounting period

(b) (i)

- Issued to the buyer as evidence of cash payments for goods or services rendered
- Used for requisition for the supply of goods/ services on credit
- Given to the buyer by the seller as evidence of goods supplied

K.C.S.E 2006 AGRICULTURE PAPER 1 MARKING SCHEME

SECTION A

1. Olericulture is growing of vegetables while pomocuhure is growing of fruits
   (Mark as whole) 1mk

2.
   - Movements of animals in large numbers
   - Decomposition of plants and animals remains by soil micro-organism
   - Physical breaking of rocks by roots of higher plants
   - Man's activities e.g. cultivation, mining and road construction
   - Mixing up of soil burrowing animals e.g. earth worms and termites

   Any 3 x 1 ½ =(1 ½ mks)

3
   - Little amount of water is used/economics water use
   - Reduces incidences of certain leaf diseases/ Fugal discs
   - Can be used in sloppy areas because there is no risk of surface run off/no risk of soil erosion
   - Water under low pressure can be used
   - Some fertilizers and pesticides can be applied with irrigation water.
   - Minimizes growth of weeds (any 4 x ½ = (2mks)

4.
   - Adds nutrients.
   - Increases microbial activity in the soil
   - Improves water holding capacity/reduces leaching/ improves capillarity
   - Buffers soil PH
   - Moderates soil PH
   - Moderates soil temperatures

5.
   - Type of cop-soil nutrient status
   - Stage of growth of crop
   - Expected yield

6.
   - Lowers soil acidity raises soil ph(modifies ph
   - Increases the calcium content of organic matter
   - Improves soil structure through flocculation of soil particles/improves drainage.
   - Facilities the availability and absorption of Nitrogen and prosperous
   - Improves legume nodulation and N fixation
   - Encourages multiplication of micro-organization in the soil

7.
   - Free from foreign materials e.g. weeds
   - Gives rise to vigorously growing plants
   - Have high germination percentage
   - Free from pest and diseases attack/healthy
   - True to type not contaminated any 4x ½ = 2mks)

8.
   - Easy to determine plant population in a given area
   - Ensure high quality produce.
   - Ensures high production
   - Facilities optimum use of nutrient moisture and light
   - Permits use of machines when carrying on subsequent farm operations
   - Facilities control of pests and e.g. ground

9.

- Pollution of the environment
- Loss of plant nutrients and soil microorganisms
- Siltation of dams and rivers
- Reduction of soil depth
- Destruction aid farm structures (Any 4 x ½ = 2 mks)

10.
- Burning pasture during grazing season, cultural method
- Moving/physical method
- Use of biological agents/ Biological methods

11.
- Provide feed during period of scarcity/ distribute available forage for livestock through the year
- Ensure better and proper utilization of land
- Can be sold for money

12.
- Top dress with N fertilizers occasionally/ apply manure
- Control weed
- Practice controlled grazing to avoid denudation
- Cut back dry and unpalatable stems to encourage fresh re-growth/ topping
- Re- seeding when necessary
- Irrigation when necessary
- Control of pest (Any 4 x ½ = 2 mks)

13 (a)

GDP- is the sum total of goods and services produced by a country within a period of one year. (1 x ½ = ½ mk)

16.
- To keep check on income and expenditure / profit and loss
- To know which activities are financially viable/ weakness and strength of the business
- To obtain knowledge of the total value of the farm/ the value of assets and liabilities for farm planning
- To assess credit worthiness
- To provide information for tax purposes
- Organizing agriculture field days for the local community
- Participating in agricultural exchange programs both locally and internationally

(Any 4 x ½ = 1 ½ mk)

17.
- Organizing and participating in annual YFC rallies and camps
- Participating and completing in ASK show activities e.g livestock judging
- Planting trees/ carrying out agricultural project in schools
- Organizing agricultural field days for the local community.
- Participating in agriculture exchange programs both locally and internationally.

(Any 4 x ½ = 2 mks)

18.
- Adds- organisms matters
- Recycles soil nutrients
- Helps to control soil erosion
- Improves drainage of swampy areas
- Plays an important part in the hydrogical

B- Trapping and killing

Use of scare crows/ scaring
Poisoning/ rodenticide usage 1x1 = (1 mk)

21.

(a) The law state that "if successive units of one input are added to fixed units of other inputs, a point is eventually reached where additional output per additional unit of input will decline"
(mark as a whole)

(i) At the end of the third unit of fertilizers application

(ii) This is the least profitable unit of fertilizer application beyond which there would be a loss

(iii) Marginal returns (MR) at the point of optimum production
MR = Kshs 1200 x 2 = 2400/=

22. (a)

- Read the label/ the manufactures instruction
- Measure the requirement amount of fungicide
- Place it into a container and mix thoroughly
- Powder has dissolved completed/ has formed slurry
- Pour the mixture into the knapsack sprayer though the sieve
- Spray the mixture onto the crop

(b) Blight (late or early) powdery mixture (1 mk)

(c)

- Spray following the direction of the wind
- Wear protective clothing
- Avoiding eating or smoking while handling fungicides
- Avoid spillage of the fungicide/ avoid containing the environment
- Do not suck/ blow a blocked nozzle Any 4 x Vi = (2 mks)

23.

(a) blackjack/ Bidens pilosa

(b)

- To avoid competition for nutrients, moisture arid light
- Black jack seeds may contaminate some crops/ farm practice
- Blackjack may be an alternate host to some pest e.g aphids which may attack crops like beans
- Black jack seed prick and irritate workers Any 2 x 1 = 2 mks)

(c) - MCPA
- 2, 4-D

(d) At what stage if growth of maize should the weed controlled using a pest?
- 10 to 15 cm hi
- 2 to 4 week after emergence 1 x 1 = 1 mk

SECTION C

24.

- Clear the place, if bushy
- Dig/prepare the site to a desirable tilt/ Fine with
- Remove roots and stone from the site
- Prepare nursery beds 1- 1.54 wide by any convenient length
- Prepare raised or sunken nursery bed depending on moisture content available
- Level the Nursery bed (Any 4 x 1 = mks)

(b)

- Make shallow furrow drills/ about 10cm apart
- Apply phosphates fertilizers in the furrows/ Drill and mix with the soil
- Sow seeds by drilling
- Cover the seed lightly with soil
- Apply some mulch after sowing seeds

- Water the nursery thoroughly (any 3 x 1 = 3 mks)

(c)

- Remove the mulch as soon as seedling emerge
- Water the nursery at least twice a day, preferably morning and late evenings
- Remove weeds as they come up
- Thin young seedlings if over crowded/ prick seedlings
- Control diseases
- Harden off the seedling/ remove shade gradually and reduce frequency of watering

(any 5 x 1 = 5 mks)

(d)

- Water nursery thoroughly before transplanting
- Dig the planting holes at appropriate depth
- Select healthy seedlings
- Uproot seedlings carefully with as much as possible to avoid root damage/ use a garden trowel
- Transport seedling carefully to the end field using appropriate means
- Transport on a cloudy day or late in the afternoon
- Place insecticide in the hole to control soil borne pests
- Place the seedling in the planting holes at the same depth they were in the nursery bed
- Fill the hotels with soil and firm around the seedlings
- Apply mulch or erect a shade
- Water the seedling thoroughly (Any 5 x 1 = 5 mks)

25. (a)

- Availability of adequate funds or capital/ inputs
- Training of personnel or availability of advisory services on managerial skills
- Loyalty on the part of all farmers, co-operators and officials to support their organization
- Proper and accurate record keeping and accountability for all operations
- Efficiency with which produce from farm are marketed
- Honest on the part of personnel with regard to the handling of co-operative finances
- Timely payment of farmers dues

(b)

- Diversification/ growing a variety of crop or having various enterprises so that if one fails has something to rely on.
- Insurance against losses/ taking insurance policy for farming activities so that in case of failure the enterprises are covered.
- Inventory marketing/ strategic farming keeping farm product and selling at when prices are favorable
- Flexible enterprises engaging in enterprises that can be stopped or started early as condition change.
- Rationing of inputs using just sufficient inputs such that in case of losses the cost are not too high
- Using more certain husbandry practices using practices that the farmer is sure of and has used in the pas.
- Hedging/ contract marketing making arrangements with marketing agencies in advance so that changes in price after the arrangement do not change the price of the farmer's produce.
- Selecting more certain enterprises selection of enterprises that the done well in the area/ tried though research (any 7 x 1 = 7mks)

C.

- Determination of the farmer's objectives and preference in order to eliminate those production possibilities that are unsuccessful
- Determination of available resources to the farmer in order to establish his/her abilities and limitations.

- Determination of possible productive enterprises
- Determination of tentative budget/ translation of physical plan into a financial
- Determination of yield f various enterprises
- Development of financial flow in order to establish the capital requirements
- Examination of the plan to ensure that is is consistence, workable and desirable
- Determination of government policies and regulation to make the plan realistic.

(Any 8 x 1 = 8 mks)

26. (a)
- Ponds/ water pumps
- Dams/ weirs
- Roof catchments
- Rock catchments
- Retention ditches/ level terraces

(b)
- Continuous cropping without giving the land a rest
- Burning
- Ploughing along the slopes/ farming on step land
- Deforestation
- Ploughing along river banks
- Cultivating when the soil is too dry or wet
- Overgrazing/ overstocking
- Flooding/ application of a large amount of water at high rate
- Over cultivating the land to fine tilth/ pulverizing the soil

(c)
- Mulching by reducing the speed of run- off and reducing the impact of raindrops
- Contour farming by reducing the speed run off
- Terracing effective length of the slope and consequently slowing down speed of running off
- Planting trees/ holding soil particles together hence reducing effects of wind erosion and reducing the impact of rain drops
- Establishing and maintaining vegetated water; by reducing the impact of livestock on the soil erosion
- Establishing trash lines/ sones lines by reducing speed of run- off an effects of wind erosion

K.C.S.E 2006 AGRICULTURE PAPER 2 MARKING SCHEME
SECTION A

1. Hampshiredown (1 mark)
2. Cross cut saw/ Tenon saw/ Back saw/ spokes have/ circular plane 2 x ½ = 1 mk)
3. Removal/ harvesting of marketable size fish from the pond (1 mk)
4. Prevents metal engine parts from rusting
   - Promotes free movement of engine parts by reducing friction
   - Traps foreign materials e.g. soot, dirt and dust
   - Lowers engine temperature by conducting away excess heat
   - Helps in sealing compression between the piston and cylinder 4 x ½ = 2 mks
5.
   - Keeps radiator fins free of rubbish and dirt. Water pump lubricated regulated/ weekly
   - Ensure that the fen belt is tightly fitted/ proper tension/ lock bolts and nuts should be tightened

- All pipes should be fitted tightly to avoid leakage
- To up the level of water in the radiator before using the tractor

4 x ½ = 2 mks)

6.
- Disc ploughs work better in dry/ sticky and hard soils than mould board plough
- There is less hindrance to operations chances of breakages because the discs roll/ ride over obstacles
- The maintenance costs of disc plough are lower than the moldboard\
- Disc plough require less tractor- power to pull than moldboard

7.
- An outlet to drain off excess water
- An inlet for fresh water supply
- A spill way channel to take away excess water/ overflow water
- A screen to prevent escaping of fish/ entry of unwanted objects/ fish
- A fence to keep away predators/security
- Dikes walls embankment/ leaves (4 x ½ =2 mks)

8.
- Through the mough/ natural openings
- Through umbilical cord
- Through respiratory track
- Through injury/ wounds on the body
- Though bites by disease vectors (4 x ½ = 2 mks)

9.
- Spraying insecticides the breeding places
- Clearing the vegetation
- Use of appropriate insecticides to spray cattle
- Sterilization of the male tsetse flies (4 x ½ = 2mks)

10.
- Overgrown hooves
- Wet and muddy conditions
- Physical foot injuries (2 x ½ = 1 mk)

11.
- High milk yields
- Good health
- Fast growth/ early maturity
- High growth/ maturity
- Good mothering ability
- Good body conformation (4 x ½ = 2 mks)

12.
- They can browse and survive on poor vegetation
- They have hooves with tardy pads which enable them to tra- verse large area sandy ground/ flat hooves
- They can tolerant to high temperature/ have thick skins
- They can travel long distances for several days with very little water
- Store fats in humps/fats can be metabolized to metabolic
- Long eye lashes to prevent entry of sand/ have nose flaps

13.
- Softening moistening of the food
- Storage of food (2 x ½ = 1 mks)

14.
- Using of caustic potash stick

- Use of disbudding ron/ dehorning
- Use of dehorning saw or wire
- Use of rubber ring and elastrator
- Use of dehorning collusion (4 x ½ = 2 mks)

15.
- Overcrowding
- Pest infestation/ pest diseases
- Noise/ strangers
- Lack of food and water
- Sudden change in routine/ management
- Unbalanced diet
- Fluctuation in temperature
- Introducing new bird in the flock

16.
- Feeding the queen / the broods
- Protecting the hive from intruders
- Collecting nectar, pollen, gums and water/ Foraging
- Cleaning the hive
- Building combs and sealing cracks
- Making honey bee wax
- Scouting (4 x ½ mk= 2 mks)

17.
- Should be rain- proof/ leak proof
- Should be well ventilated
- Should be easy to clean
- Should be well lit
- Should have adequate space
- Drought free
- Good drainage (4 x ½ = 2 mks)

SECTION B

18. (i) A- Furrow opener
B- Fertilizer hopper
C- seed hopper
D- Press wheel (4 x ½ = 2 mks)

Clean hopyjers/ tuirow openers after use
- Lubricate/ grease moving parts
- Replace worn out lost bolts and nuts

(ii)
- Check tension of chains/ drive sprockets before use
- Tighten loose bolls and nuts (any 2 x 1 = 2mks)

(b) (i) E - adjustable spanner
F - Ring spanner 2 x ½ = 2mks)

(iii) Tool E can be used for tightening or loosening more than two sizes of nuts and belts
(Rejects one is adjustable (1 mk)

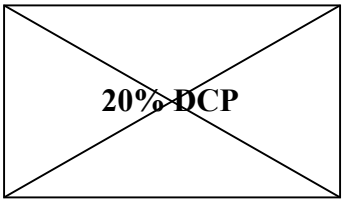
19 (a)
(i) Slatted floor 1 x1 = 1 mk
(ii) (H 40 – 60 cm high
(b) (i)
- To allow urine and dung to pass through
- To keep the floor dry (Any 1x 1 = 1mk)

(ii)

- Prevailing direction of the wind
- Safety/ security
- Proximity to the dairy shed/ accessibility of the dairy shed
- Drainage
- Topography (any 3 x 1 = 3 mks)

20. (a) Term used to express that amount of the crude protein absorbed by an animal's body from a feed 1 x ½ = 1mk)

(b) Pearson's square method

Maize 10% DCP 35- 

20 = 15 parts of maize

Sunflower 35% DCP Sunflower

Amount of maize 15/25 x 200 = 120kg

Amount of sunflower 10/25 x 200 = 80 kg

Mark as shown in the diagram 4 x 1 = 4 mks

21 (a) G - Muzzle
H - Poll
I - Shoulder
J - Heart girth 4 x ½ = 2 marks)

(b) Ear lobs/ deep in the ear
Anus
Vulva
Under tail 4 x ½ = 2mks)

22. (a)

- Spray the entire backline from my shoulder to the tail head
- Spray the sides in a zigzag motion to trap me retain the wash from the backline
- Spray the belly with me nozzle facing upward
- Spray the scrotum/ udder and the hind flanks carefully
- Spray both hind legs up to and including the heels
- Spray under the tail head and the area around the anus and vulva
- Hold the tail switch on to the rump and spray it thoroughly to ensure complete wetting
- Spray the neck and the foreleg; from the flanks to the heels
- Spray the head and face making sure that bases of the horns are thoroughly wetted,
- Spray the inside of the ears 10 x 1 = 10 mks)
- (b) (i) Causal organisms – Virus/ virus types O, A, C/ south African types SAT1, SAT2, SAT3, / Asian type 1 (1 x 1 = 1mk)

(ii)

- Cattle
- Pigs
- Goats
- Sheep

- Profuse salivation (Any 2 x 1=2 mks)
- Blisters which are painful around the mouth and hooves of the fect leading to lameness
- Drop in milk production in lactating cows
- Sharp rise in temperature/ high fever
- Emaciation
- Complete loss of appetite
- Diarrhoea (any 4 x 4 = 4 mks)

(iv) Quarantine
(a) Vaccination very 6 months
(b) Slaughter and destruction of carcass
(c) Regulations of livestock movement by issue of movement permits
(d) Burn/ bury dead animals

23 (a)

- Select good animals on the basis of high yielding cows
- Select animal with good health
- Select animals having high fertility
- Select animal having good dairy conformation
- Cull poor producers
- Use superior bulls/ semen from superior bulls to service the cows
- Mate heifers when fully mature considering weight/ age
- Breed cows 60- 90 days after calving to maintain after calving interval of one year
- Keep animals health by routine vaccination
- Control internal parasites by routine drenching using appropriate drugs
- Treat sick animals
- Avoid physical injuries to the animals/ predisposing disease factors
- Improve sanitation/ cleanliness in the farm
- Feed the cattle on a balanced diet
- Give adequate feeds
- Give clean and uncontaminated feed
- Provide plenty of clean water
- Provide minerals/ vitamins
- Provide housing/ avoid overcrowding/ provide shelter that is leak proof
- Use proper milking techniques
- Milk at regular intervals (Any 15 x 1 = 15 mks)

(b)

- Control stocking rage
- Control of water pollution
- Supply adequate feed regularly
- Provide appropriate feed
- Aerate the eater by ensuring constant inflow and outflow of water
- Control predators
- Harvest fish at the correct maturity stage
- Maintain appropriate water level in the fish pond always
- Add manure or fertilizer in pond to encourage growth of planktons

(Any 5x 1 = 5 mks)

24. (a)

- Farm operations can be achieved on time

- Large area can be covered within a short time
- Reduce drudgery/ makes work easy and enjoyable
- Better job is done mechanically than human labor/ increased efficiency
- High yields are obtained because farm operations are carried out on tme
- Pest and disease outbreak can be controlled relatively in a shorter time
- Tends to encourage farmers to consolidate their land
- Farmers benefit from economies of scale
- Use less labor (Any 6 x 1 = 6 mks)

(b) TWO STROKE CYCLE ENGINE

- Cheap to buy and easy to maintain
- Produce less power/ do less heavy
- Mainly air cooled
- Inefficient in fuel and oil utilization
- Easy to transport to different areas of the farm land e.g hilly areas\
- Require two complete upward and downwards movements of to be position, and one revolution of crankshaft
- There is no provision of oil in the sump, during induction, to lubricate the crankshaft
- Simple in construction with no valves
- Has 2 openings exhaust

(c) FOUR STROKE CYCLE ENGINE

- Expensive to buy and maintain
- Produce more power/ do heavy work
- Efficient in fuel and oil utilization
- Mainly water cooled
- Difficult to transport easily due to weight
- Require 4 complete upwards and downwards
- 2 revolutions of 1 he crankshaft
- Engine have oil in the sump to lubricate the crankshaft bearings
- Complex in constructions with two valves (inlet and outlet)
- Has no parts and inductors ports any 6x 1 = 6 mks)

- Using a dip – stick to check the level of oil in the sump
- Check the fuel tank to ensure there is adequate fuel for the day's job
- Check the level of the electrolyte in the battery and adjust accordingly.
- Grease/oil moving parts
- Check-fan belt. Tension' and condition and adjust accordingly
- Check level of water in radiator and top up if necessary
- Check air cleaner to ensues that there is no dirt/check level of oil
- Check tyre pressure before work and adjust accordingly
- Tighten bolts, nuts and pins
- Open and remove the dirt from sediments bowels

Any 8x1=8 marks

KCSE AGRICULTURE MARKING SCHEMES 2007 PAPER 1

1.

- Very steep land
- Water logging / marshy area.
- Forested / Bushy area.
- Rocky / Aridity/Tsetse fly infested areas.

2.

- Wind / Moving water
- Temperature changes
- Moving ice/ Glacier

3.

- Using a sieve / sieve analysis.
- Sedimentation method

4.

- Can be used as a security for credit.
- Encourage long term investments
- Reduces land disputes
- Motivates the farmer to conserve soil water.

5.

- Improves soil structure
- Controls soil borne pests and diseases.
- Ensure maximum utilization of farm labour.
- Aids in weed control
- Improves soil erosion.
- Security incase of failure of one crop.
- Add nitrogen through N – fixation by Rhizobium bacterial when legumes are included.

6.

- Crop attacked / mode of feeding .
- Whether field or storage pest.
- Crop parts attacked.
- Stage of crop growth attacked.
- Scientific classification e.g. insects, mite, rodents.

7.

- Important in calcium utilization.
- Necessary in sugar translocation
- Needed in water absorption.
- Aids in translocation of sugar nitrogen and phosphorous.
- Aids in fruit development.

8.

- Development of infrastructure.
- Housing status of the citizens.
- Increase in recreation facilities.
- Ratio of teachers to students.
- Improvement in the level of technology/ more industrialization.

9

  - Price of substitutes.
  - Price expectations in future.
  - Quality of the commodity
  - Tastes and preference of the commodity.

10
- Medicago sativa/Lucerne
- Leucaena leucocephalal/calliondra.
- Artemisia annual/Artemisia.
- Calliandra calothyrsusl calliandra
- Desmodium species
- Kenya white clove/ Infoliuim sempilosum

11
- Quantity of forage available for ensiling.
- Number of animal to cater for.
- Length of the period of forage scarcity.
- Bulkiness of the material.

12
- To avoid poisoning of livestock.
- Minimize diseases spread.
- To ensure the forage is of high palatability.
- Minimize competition for nutrients, space light.
- To increase the life span of the pasture.

13
- Has appropriate depth
- The right PH/ Good soil structure.
- Good water logging capacity.
- Well aerated/good drainage.
- Free from soil borne pests and diseases.
- Rich in nutrients in the right proportions.

14
- Should be of high purity.
- Should be free from pest and disease attack.
- Should be appropriate size
- Should be mature.
- Should be free from any physical damage.
- Should be of high percentage of germination.
- Should be suitable to the ecology of the area.

15 (a)
- Over –cultivation, overstocking/overgrazing.
- Deforestation/planting annual crops on steep slopes.
- Burning of the vegetation.
- Ploughing up and down the slope.

(b) V- shaped gullies U-shaped gullies.

16. (a)
- There is proper supervision of the farm.
- Reduces costs on traveling
- Easy to get extension services.
- Allows good farm planning.
- It enhances proper pests, diseases and weed control.
- Encourages long term investments.

(b)
- Landlord can earn income from the land.
- People who have no land are able to access to farming.
- Idle land is put into agricultural use.

- Tenant is able to increase/decrease the size of land leased depending on profitability.

17. (a) Shs. 800
    (b) (i) 120 bags ii) 900

18. a) A_1- root stock A_2- Grafting
    b)A_3 Grafting b- Trench layering

19. a) C_1 – Maize stalk borer, maize weevil, Aphids
    C_2 – Maize streak, white leaf blight.

20. a) $p_2 o_5 = 20\%$
    b) 1 ha = 10,000m^2 requires 300kg of fertilizer.
    5m x $10m_2$= 50m2 requires x of the fertilizer
    10,000 x = 300 x 50

    $X = \frac{300x\ 50}{10,000} = \frac{3}{2}$

21. a) Single stem pruning.
    b) The main stem is capped at 38cm above the ground to encourage more suckers to grow. Select two strong and healthy suckers and remove the others. The selected suckers should form a U-shaped to avoid splitting.

22. (a)
    - Clear the land
    - Divide the land into plots of 0.4 ha
    - Construct /repair bunds /dykes.
    - Construct/ repair inlet and outlet channels
    - Flood the field to a height of 7.5 – 10cm above the soil surface.
    - Carry out primary tillage
    - Puddle the soil to a fine mud.
    - Uprooted weeds should be heaped on the bunds.
    - Level the plots by dragging a wooden board/ jembe.

    (ii)
    - Flood the plots to a depth of 7.5 – 10 cm.
    - Leave the field flooded for 4 days.
    - During transplanting, drain the filed to a depth of 5cm,
    - Introduce water gradually as the crop establishes.
    - Maintain the water level at 1/3 the height of the crop
    - Change water every 2-3 weeks or when it is cold.
    - Water should allow to flow slowly through the field
    - Drain the field 2-3 weeks before harvesting.

    (b)
    - Irrigation during the dry season.
    - Timely pest control.
    - Timely weed control
    - Pruning, Coppicing/pollarding/capping.
    - Thinning/selective harvesting.
    - Protection against damage by animals.
    - Grafting/budding.
    - Fertilizer/manure application
    - Construction of micro-catchments
    - Structures around the trees

- Provision of shade/mulch to reduce evaporation.

23. (a)
    - Competition from cheap/synthetic / products, causing loss.
    - Change in supply of the produce; leading to price fluctuation
    - Change in market demand; leading to price fluctuation.
    - Lack of market information; leading to exploitation by middle .
    - Inadequate capital; hence poor financing of various marketing functions.
    - Poor quality of produce; leads to price fluctuation.
    - Seasonally of produce; leads to price fluctuation.
    - Bulkiness of most agricultural produce; making it expensive and difficult to transport.
    - High perishability; this leads to low quality of produce
    - Poor storage structure; leading to heavy losses of the produce.
    - Lack of knowledge in marketing leading to heavy losses.
    - Government interference through its agents leading to price fluctuation
    - Acts as a record for future reference.
    - Helps in deciding the viability of the enterprise
    - Assist in securing credit.
    - Helps to predict the profitability of the enterprise.
    - Aids in detecting problems easily hence correction is done in good time.
    - Aids in making management decisions especially when comparing between enterprises.
    - Helps in making changes in the farm.
    - Ensures periodic analysis of the farm business.
    - Encourage the farmer to be efficient so as to meet the target.

24 (a)
- Enables one to grow crops during the dry seasons.
- It's a method of land reclamation/ allows crop production in arid and semi-arid areas.
- Makes it possible to grow crops in special structures e.g. green house.
- Enables one too grow crops that require high amount of water e.g. paddy rice.
- It supplements rainfall in case it inadequate in crop produce.

(b)
- Topography,
- Soil type
- Type of crop to be irrigated.
- Amount of water available.
- Technology available.
- Distance of the source of water to the field.
- Capital available, skills available
- Climate factors of the area.

K.C.S.E 2007 PAPER 2 MARKING SCHEMES

1.
- To keep the house warm.
- To absorb moisture from poultry droppings.
- Keeps birds busy scratching, thus reducing cannibalism.

2.
- Marks's disease, avian spirochaetosis.

- Fowl typhoid, Gumboro/ infectious bursa disease.
- New castle, fowl pox, infectious bronchitis.
- Chronic respiratory disease.
- Infectious coryza of chicken.

3.
- If the sow is barren.
- Poor nutrition if the calf cold milk.
- Poor timing services

4.
- Overfeeding/ giving the calf cold milk.
- Lack of colostrums.
- Irregular feeding of calf.
- Feeding milk at wrong temperature.
- Feeding milk in dirty containers/ feeding contaminated milk.

5.
- Level of milk production
- Quality of roughages.
- Availability of the concentrates.
- Economic factors/cost of concentrates.
- Physiological status.

6.
- Washing the udder with warm water.
- Allow the calf to suck for a while
- Feeding the cow during milking.
- Regular milking time
- Sound associated with milking.
- Massaging the udder when washing it.

7.
- To make the animal docile
- Reduce, incidence of animals injuring each other/attendant.
- Reduce incidence of animals damaging farm structures.
- Increase feeding, watering transportation space.
- Add aesthetic value to the animal.

8.
- Halters, Nose bull ring and leading stick. Rope.

9
- Carcass lacks rigor mortis.
- Excess bloating
- Water tar-like blood oozes from body openings
- Oozing blood clot.
- Rapid purification.

10
- Introduce toxins that are harmful to the animal.
- Cause anaemia/transmit diseases.
- Cause wounds that allows secondary infection.
- Cause irritation which leads to scratching/destroy wool.

11.
- Source of water/Type of soil
- Topography.
- Closeness to homestead/accessibility.

- Closeness to the market/consumers.
- Far away natural sources of fish.

12.

- Adjust the depth of ploughing
- Adjust furrow width of ploughing
- Front furrow depth.
- Lowering /raising ploughing pitch.

13.

(a)

-Saanen, anglo-Nubian, Toggenburg. British alpines, Jamnapari.

14

- proper feeding. prophylaxis, quarantine.
- Proper housing, control of parasite.
- Practice farm hygiene.
- Routine vaccination.
- Use of healthy breeding stock.
- Timely treatment of the sick livestock.
- Control of vectors, dipping, spraying.

15

- Wind power. Water power, animal power solar energy. Human power, Biogas Geothermal.

16.

- Painting metallic parts
- Regular washing.
- Repair broken parts/cracks.
- Replace lost parts.

17.

- Fuel systems, 1
- Lubrication system.
- Electrical system.
- Ignition system,
- Cooling system,
- Hydraulic system
- Power transmission system

18

- Permanent calf pen.
- Movable calf pen.
- Concrete floor calf pen.
- Slatted floor calf pen

19.

- Calcium deficiency in the birds body.
- Blight light in the laying nests
- Birds laying on the floor.
- Presence of broken, soft shelled eggs.
- Prolonged stay of eggs in the laying boxes.
- Idleness of birds.
- Inadequate feeding.

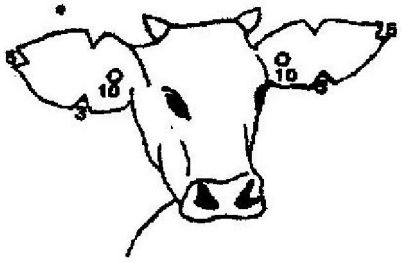
20

(a) A- cross-cut saw B- rip saw
(b) A- cutting across the grain B- cutting along the grains
(c)

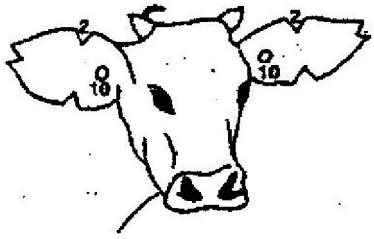
- Wipe blade with an oily rug.
- Regular sharpening of the teeth.
- Ensure the handle is firm,
- Teeth setting.
- Straighten the blade if bent.
- Proper storage of the foods.

21(a) (i) ear notching (ii) Number 40 (forty)

(ii) AC. 10+5+5+2+2 (17+17)



Animal No 36



Animal no 34

(b) Between 18-1-2007 and 20-1-2007

22. (a) Barbet wire gate

(b) C – gate post/King post/strainer
D – Wire loop
E – Dropper.

(c) (i)

- Support the gate post
- To ensure the barbet remains tout.

(ii)

- Prevent movement of farm animals outside
- Keep away livestock from outside.
- Used as entrance into/exit from the farm.

23. (a) Animal/ ox-drawn plough.

(b) G – Mould board.
J – Share
H – Land slide
K – Land wheel

(c)
- Plough/ridging
- Harvesting root crops e.g. groundnuts.
- Weeding row planted crop.
- Opening furrows for planting.

24. (a) **Advantages of battery system**.
- Higher egg produce due to less energy wastage.
- Easy to keep individual production records.
- Control cannibalism and egg eating.
- No contamination of water and feed.
- Birds are not exposed to predators, parasites and diseases.
- Facilitates culling and handling.
- Easy to collect eggs
- Egg losses are reduced.
- Many birds are kept in a given/high stocking rate.
- Eliminates broodiness.
- Birds still have tender meat at culling due to confinement.
- Facilitates mechanization.
- Keeps eggs clean.

(b) **Factors considered in selecting livestock k for breeding.**
- Body confirmation.
- Fertility/breeding ability.
- Adaptability of the breed to the arts/hardiness.
- Mothering ability in case of females.
- Production potential/yielding capacity.
- Temperament/behaving e.g. cannibalism egg eating.
- Deformities/abnormalities e.g. one eye lameness.
- Offspring performance
- Age of animal.
- Growth rate, quality produce
- Disease resistance, prolificacy.
- Lifespan/reproductive life.

25. (a) **Operation of a four stroke engine.**

(i) Induction stroke/sunction.
- The piston moves down the cylinder, causing the inlet valve to open and draw in fresh supply of petrol vapour and air into the cylinder, exhaust valve closed

(ii) Compression stroke.
- The inlet valve closes and the piston moves up the cylinder. This compresses the fresh fuel mixture into the combustion chamber, exhaust valve to close.

(iii) The power stroke.
- Fully compresses the fresh fuel mixture and as a result a spark is produced at the spark plug. This causes the fuel mixture to ignite and expand resulting in pressure that forces the piston down the cylinder. Inlet valve closed exhaust valve closed.

(b) Functions of gearbox.

- Helps the driver to select any forward or reverse gear.
- Adjust speed of the driver from the engine crankshaft to the driver shaft.
- Helps to alter the speed ratio.
- Enables the power from the engines to be more easily applied to the work done by the tractor.
- Enables the driver to stop the tractor movement without stopping the engine or without foot oppressing on the clutch all the time.

26. (a) **Features of an ideal calf pen.**

- **Concrete/raised stated floor** – Easy to maintain cleanliness.
- **Dry litter/bedding** – Maintain warmth.
- **Proper lighting –** Should have good supply of natural light/sunlight.
- **Proper drainage –** facilitate free flow of urine and water to avoid dampness.
- **Draught free –** The structure should stop strong winds from blowing into the calf pen.
- **Proper ventilation** – Structure should allow for fresh air circulation.
- **Security –** Should be strong enough to keep away intruders/wild animals.

(b) Pneumonia in calves.

(i) **Predisposing factors**

- Overcrowding of calves in the pen.
- Dampness/chilliness in the pen.
- Poor ventilation.
- Age/younger calves are more prone to pneumonia than older calves.
- Effects of diarrhea and other illness.

(ii) Symptoms.

- Rough hair coats/ruffled hair.
- Loss of appetite.
- Abnormal lungs sounds e.g. whizzing.
- Emaciation, frequent coughing.
- Nasal discharge.
- Fluctuating body temperature.
- Dull and reluctant to move.

(iii) Control measures.

- Treating the sick calve with antibiotics.
- Providing warmth in pens.
- Maintaining good sanitation in pens.
- Isolating sick calves to avoid spread of the disease.

AGRICULTURE PAPER 1 MARKING SCHEME

SECTION A (3O MKS) 2009

1. **Methods of treating water**

   i. Chemical treatment/chlorination/soda ash/sodium hypchlorate

   ii. Filtration

   iii. Boiling

   iv. Aeration

   v. Sedimentation/decantation/use of Alum(Aluminium Sulphate)

   vi. Storage for 36 hrs

2. **Examples of water pipes**

a) Meta pipes:

   i) Galvanized iron popes/steel pipes

   ii) Aluminum pipes

   iii) Copper pipes (2x ½)

(1mk)

b) **Hose pipes: hose**

   i) Rubber pipes

   ii) Plastic Hose pipes/ Pvc pipes (Poly viney chloride pipes) (1 mk)

3. **Disadvantages of Communal land tenure:**

   i. Encourage soil erosion

   ii. Results in overgrazing/overstocking

   iii. Difficult to control breeding/breeding diseases

   iv. No individual security on land ownership

   v. Difficult to acquire loans for agricultural development projects

   vi. Difficult to carryout sound farm

vii. Encourages spread of diseases and parasites

viii. Encourages land disputes among community members. (2 mks)

4. **Site for agro-forestry trees;**

i. Farm boundaries

ii. Homestead

iii. Terraces

iv. River banks/water catchment areas

v. Steep slopes/slopes

vi. Within pasture land between crop plots

5. **Financial documents:**

i. Receipt

ii. Invoice

iii. Statements

iv. Purchase order

v. Delivery 4x 12=(2mks)

6. **Check dams and erosion control**

i) slow down the speed of run-ff to reduce erosive power of water

ii) Reduce the volume of run-offs

iii) trap soil sediments (2x ½) (1mk)

7. Methods of budding

i) T-budding

ii) Top budding

iii) Patch budding 2x ½ (1mk)

8. **Reasons for sitting a nursery under shelter.**

i) Reduce damage to seedlings by strong wind

ii) Reduce evaporation/transpiration rate due to strong sun and wind. (1mk)

9. **Burning of vegetation.**

i. Destroys organic matter humus

ii. Destroys soil structure

iii. Kills useful soil micro-organisms

iv. Exposes soil to agent of erosion

v. Causes nutrient imbalance/loss of volatile nutrients/accumulation of soils

(2 mks)

10. **Forms of Nitrogen**

i) Nitrate form/Nitrate ions/ NO^{-}_{3}

ii) Ammonium form/ammonium ions/ NH^{+}_{4} (1mk)

11. **Wilting of sorghum**

i) To avoid prussic acid/hydrocyanic acid poisoning (1mk)

12. **Roles of soil micro-organisms**

i) Decomposition of organic matter to release plant nutrients

ii) Some fix nitrogen/ sulphur into soil

iii) Some produces toxic substances that help control soil borne disease.

(1mk)

13. **Hybrid and composite**

Hybrid- Is bred by crossing to bred varieties/inbred lines under controlled pollination while:

Composite:- Is bred by crossing a number of varieties under uncontrolled pollination

(mark as a whole) (1mk)

14. **Optimum temperature**

i) Enhances seed germination/emergence

ii) Promotes soil microbial activities

iii) enhances vigorous growth and development

iv) Enhances high yields (1 ½ mks)

15. **Harmful effects of strong wind**

i) Results in soil erosion/loss of plant nutrients

ii) Results in lodging of crops/distortion/ shading of leaves, flowers, fruits /brae of branches

iii) High evapo transpiration rates causing wilting of plants.

iv) Spreading of diseases/weed seeds/pests

(1 mk)

16. **How cover crops conserve soil moisture**

i) Reduces surface run-offs/increase water infiltration into the soil

ii) Reduce evaporation rates (1 mk)

17. **Reasons for**

a) **Pricking out**

i) Reduces competition for light, space, nutrients

ii) To enable the seedlings to (1x1) grow strong (1mk)

b) **Root trimming**

i) Encourages development of short, dense and strong rooting system for faster establishment after transplanting

ii) To facilitate/ease lifting of seedlings/minimize root damage during transplanting (1mk)

18. **Control of damping off disease**

i) Reduce/remove shade

ii) Thinning to reduce overcrowding

iii) Reducing amount and frequency of watering

iv) Spaying with copper fungicides /appropriate fungicides (1mk)

19. **Effects of pests with both piercing and sucking mouth parts**

i) Suck plant sap causing wilting/stunted growth

ii) Some inject toxic saliva/secretions, which may cause distorted Growth/death of plants

iii) Lowers quality of crop products

iv) transmits/introduces disease agents

v) Inflicts wounds/openings which provide entry for secondary infections.

vi) Lowers crop yields (2mks)

20. **Natural factors that influence soil erosion**

i) Amount of rainfall/rainfall intensity

ii) slope/topography

iii) Type of soil

iv) Size of watershed/catchment

v) Length of the slope

vi) Vegetation cover

vii) Wind velocity/strength of wind

viii) Soil depth (2mks)

21. **Opportunity cost is zero**

i) When there are no alternatives/choices in enterprises

ii) When production resources are not limited/are abundant/free (1mk)

SECTION B (20 MKS)

22. a) **smut/maize smut /Ear smut** (1mk)

b) i) sugarcane

ii) Sorghum

iii) Barley,

iv) Oats,

v) Millets

vi) Pasture grasses (accept specific examples e.g. nippier grass)

(1 mk)

c) **Control for smut:**

i) Plant certified seed

ii) crop rotation/close season

iii) Field hygiene/destroy crop residues

iv) Hot water treatment (wheat and balley seeds) (2mks)

23. a) **To compare porosity/drainage/infiltration water holding capacity of different soils** (1mk)

Accept words that mean companion e.g. identify drainage)

b) Identification of soil samples.

A - Sandy soil

B -Loamy soil (1mk)

c) Improve soil structure of soil sample c.

i) Adding organic matter/manure

ii) Liming

iii) Sub soiling/proper silage

iv) Draining away excess water (2mks)

24. a) Ridging (½)

b) **Tertiary operation**

- Soil is dug in a continuous line; and heaped on the side(s); to form a bund/ridge/ridge/ a furrow is made and soil is heaped on the side to form a ridge/bund (mark as a whole) (1 ½ mk)

c) **Advantages of planting on ridges.**

i) Promotes tuber/root expansion/development

ii) Facilitates harvesting of root crops

iii) conserves soil and water

iv) Facilitates drainage in water logged soils (2x1) (2 mks)

25. **Functions of ingredients**

a) Wood ash:-

i) Improves level of phosphorus & potassium in the manure

ii) Modifies soil PH to enhance microbial activities./reduces acidity (1 mk)

b) Top soil

Introduces micro-organisms necessary for decomposition of organic materials. (1mk)

26. Deficient nutrient elements

a) Practices during harvesting of tea.

i) Use of a plucking stick

Helps to maintain a uniform/level plucking table (1mk)

ii) Use of woven basket

. Facilitates air circulation/ aeration to prevent fermentation of tea (1 mk)

b) i) Staking (½ mk)

ii) **Reasons for staking**

i) Enhances production of clean fruits/improves quality of fruits.

ii) Helps in controlling diseases

iii) Facilitates spraying/harvesting of the crop/weeding/pruning

iv) Prevent infestation by soil borne pests (1 ½ mks)

SECTION C (40 MARKS)

Describe the production of dry beans under the following sub-heading

28. i) **varieties common in Kenya.**

i) Rose coco/GLP2, ii) mwezi moja/GLP,iii) 1004, iv) Canadian wonder/ GLP24;; K74;

v) Wairimu/Red haricot;v1) Mexican 142; Mwitemania (2mks)

ii) **Selection and Preparation of planting materials;**

i) Select varieties suited to the local ecological conditions

ii) Select dry and mature seeds

iii) Select sound seeds that are free form physical damage and winkles

iv) Dress seeds with appropriate chemicals to control soil borne pests and diseases/seeds should be dressed against soil borne pests and diseases.

v) obtain seeds from a reputable source/certified seeds (healthy pest and disease free) (3mks)

vi) Seeds should be inoculated with right strain of bacteria if necessary.

iii) **Planting and weeding**

i. Plant at the beginning of rains/timely planting/when soil/when soil has enough moisture.
ii. Make shallow furrows /holes at a depth of 3-5cm using appropriate tool
iii. Apply phosphate fertilizer during planting
iv. Place 2-4 seeds per hole and cover it up with the soil/seed rate of 50-60 kg/ha
v. Spacing is 30-50 cm by 10-15 cm depending on the variety
vi. Shallow weeding is done to avoid root damage
vii. Weeding should be done when the field is dry to avoid spread of diseases when conditions are wet.
viii. Keep the field weed tree during easy stapes of growth
ix. Apply fertilizer at due rate of 300 kg of ssp or 150 kg/ha of Dsp or 200 kg/ha of DAP.

b) **Safety precautions when using herbicides:**

i) One should wear protective clothing such as masks, glove, overalls and boots.
ii) Avoid inhaling the herbicides by not smoking while spraying/spray alone the education of wind
iii) Read the manufacturer's instructions and follow them strictly
iv) Avoid sucking or blowing blocked nozzles
v) Immediately after handling chemicals the user must wash thoroughly to remove chemical traces.
vi) Herbicides should be stored in a safe place away from food and out of reach of children
vii) Equipment used in herbicide application should not be washed in water sources used by humans and animals/to prevent pollution.
viii) Equipment used in herbicide application should not be washed in

water sources used by humans and animals/to prevent pollution.

ix) Empty containers and left-overs should be properly disposed off in such a way that they will not pose danger to people, animals or the environment

x) Avoid chemical spillage in places that are unintended/where it may cause danger to human and animals.

xi) Equipment used should be washed thoroughly to avoid damage to crops/animals in subsequent operations

xii) Avoid eating or handling food before washing (10 mks)

NB: (mark 1st 10)

29. **Explain five advantages of mulching in crop production.** (5 mks)

a) Advantages mulching:

i) Has an insulating effect thus modifies/regulates soil temperatures

ii) Prevents water evaporation therefore moisture is retained in the soil for the plant use.

iii) Controls soil erosion by intercepting rain drops before they hit the soil, Reducing the speed of runoff and increasing rate of water infiltration.

iv) Organic mulch decomposes into humus thereby improving soil structure/water holding capacity/drainage/aeration

v) After decomposition it improves soil fertility by releasing nutrients.

vi) Controls weed by covering the soil and sup repressing their growth

vii) After decomposition organic mulch betters soil PH/increases calcium exchange capacity.

(5 mks)

(b) **Outline five activities that may be undertaken in organic farming.**

(5 mks)

i) Mulching

ii) Application of organic manure/organic fertilizers

iii) Crop rotation

iv) Use of medicinal plant products to control diseases and parasites

v) Rearing of livestock on natural/feedstuffs without use of chemical additives

vi) Physical/cultural /pests/weed/parasite and disease control

(Accept any specific measure of control) 5x1= (5 mks)

(c) **Discuss ten benefits a farmer is likely to get by using vegetative propagation in production of oranges** (10mks)

i) Production/development of early maturing crop

ii) Development of high yielding orange crop

iii) Makes the plant to assume the desired shape/size e.g. budding spread sideways/easy to manage.

iv) can obtain two or more orange varieties on the same root stock.

v) Ensures maintenance of genetic/clonal characteristics to ensure uniformity.

vi) Facilitates development of drought resistant crop

vii) It facilitate propagation of seedless orange varieties

viii) Its used to develop tree plant that are less thorny

ix) Facilitates fast multiplication of the desired crop/variety of oranges

x) Is utilized to develop orange crop that is resistant to diseases

xi) Is utilized in repair/treatment of damaged parts of orange trees.

(10 mks)

30 a) **Explain then roles of a farm manager in agricultural production.**

(10 mks)

Roles of a farm manager:

i. Short- term planning for quick decision to avoid losses when where is an urgent activity.
ii. Long-term planning: -Collecting information relevant to the farm enterprises. E.g. marketing activities, production techniques
iii. Information gathering: - Collecting information relevant to the farm enterprises e.g. marketing activities, production techniques
iv. Budgeting :- for future income and expenses as proposed in the farm plan.
v. Comparing standards of the farm/enterprises with the set standards and making appropriate adjustments
vi. Detects weaknesses and constraints and finds ways of overcoming them
vii. Keeps up to date farm records and uses them in daily running of the farm
viii. Implements farm decisions
ix. Guides and supervises the implementation of the farm plan of
x. Compares performance of the farm with that of other similar farms
xi. Makes predictions of the farm business
xii. Makes predictions of the farm business
xiii. Is the accounting officer on all financial transactions of the farm

(10 mks)

b) **Describe five roles of Agricultural based women groups in farming** (5 mks)

Roles of women Groups:

i. Loaning members to finance their farming activities.

ii. Enlightening members on improved/modern farming techniques/emerging issues

iii. Establish income generating activities for members

iv. Assist in marketing agricultural produce for the members.

v. Buy farm inputs in bulk and sell to members at a low price

vi. Collectively assist members in their farm operations

vii. Guarantees members for loans

viii. Gathering information on intended projects/feasibility study.

ix. Acts as agencies of change in a community. (5mks)

c) **Describe land preparation and planting in carrot production. (5 mks)**

land preparation and planting in carrot production.

i. Clearing the bush using appropriate tool

ii. Primary cultivation using appropriate tool

iii. Secondary cultivation/harrowing to a fine tilth

iv. Make drills 30 cm apart and 1 cm apart and 1 cm deep

v. Apply phosphates /DSP/DAP /MAP fertilizer during planting

vi. Sow seeds along the drills

vii. Cover and firm the seeds with soil

viii. Apply at the rate of 90 kg/ha of DSp/DAP

ix. Remove an perennial weeds

x. Plant at due onset of rains/when the soil has enough moisture.

AGRICULTURE PAPER 2 MARKING SCHEME 2009

SECTION A

	Cattle	Pigs	Poultry
Young from birth/batching to weaning	Calf	Piglet	
Young female before fist parturition/laying	Heifer		Pullet
Mature male for breeding		Boar	Cock

(6 x ½) (3 mks)

2. **Viral diseases:**

a) Cattle -lumpy skin disease

-cattle plaque/Rinderpest #mad cow disease

-foot and Mouth disease # Riftvalley fever (1 mk)

b) Poultry -Newcastle # Avian flue

-Fowl pox # marecks disease

-Gumboro/infection bursa (1 mk)

3. **Intermediate hosts.**

a) Liver fluke (Fasciola spp) - French water snail/Lymusea translated

b) Tapeworm (Taenia spp) - pig/cattle (1mk)

4. **Reasons for feeding colostrums**:

- It is highly digestible hence suitable for the digestive system which is not fully developed
- It is highly nutritious
- It contains antibodies enabling the young stock to resist early infections
- It has a laxative effect
- It is highly palatable. (2 mks)

5. **Advantages of artificial method of calf rearing**:

- Farmer is able to keep accurate records of milk yield
- Easy to regulate the amount of milk taken by the calf
- cows produce milk even in the absence of the calves
- allows for maintenance of high standard of hygiene during milking
- there is a possibility of the farmer selling more milk thereby maximizing profits.

(2 mks)

6. **Harmful effects of tsetse flies:**

- Transmit the disease trypanosomiasis.
- stuck blood thereby causing anaemia
- Their bites cause damage to skins
- bites cause wounds which may act as routes for secondary infections by pathogens cause irritation to the animal.

(2mks)

7. **Reasons for raddling in sheep management:**

- To help identify rams which have mated with ewes/those incapable of mating
- To identify ewes that have been served/fertile/those that are infertile/ not served.

8. **Reasons for steaming up;**

- Accustom the cow to concentrate feeding

- ensures birth of a healthy calf
- Build up energy for parturition
- Increases and maintains high mil yield after birth/stimulate alveoli cells development
- Promotes good health of the cow/mother
- Provide nutrient for maximum foetal growth. (2 mks)

9. **Limitations of using hydroelectric power**

- Very high initial capital required for installation
- If the market is not large, it becomes uneconomical to install
- Water supply can become unreliable in case of prolonged drought.
- The river may change its course leading to wasted investment
- Not all farmers can afford the use of electric appliances
- Lack of skilled personnel
- Lack of river on individual farms (2 mks)

10. **Reasons for maintaining a wheelbarrow:**

- To reduce cost of repair/replacement
- To improve efficiency
- To prolong life of the wheelbarrow
- To reduce injury/accident incidences (1mk)

11. a) bastard file used for smoothing metal while rasp file is used for smoothing wood. (1mk) (mark as a whole)

b) Copying saw is used for cutting curves wood while hacksaw is used for Cutting metal/Lastics

12. **Disease caused by Protozoa**:

- East cost Fever (E.C.F.)
- Anaplasmosis/gall sickness
- Coccidiosis (Nagana)
- red water/Babesiosis
- Corridor disease
- Nairobi sheep disease
- Trichomoniasis
- Sweating disease.

13. **Ways of restraining cattle:**

- Use of ropes/halters/casting
- Use of lead stick and bull ring

  Use of crush
- Use of crush
- Use of head-yoke
- Use of holding/isolation pen/yard

(4x ½) 2mks)

14 a) Incubation period:- is the duration between a disease causing organism Infests/enters an animal and the time the first disease symptoms show.

b) Mortality rate:- Is the likelihood of death occurring in case of disease outbreak which is expressed as a percentage of the affected animals that die.

15. **Conditions inhibiting milk let-down.**

- Changing of milking routine
- Strange surrounding/strangers/sudden noise/storm
- Poor milking techniques/pain
- Sickness (1mk)

16. **Reasons for rearing indigenous cattle in marginal areas of Kenya:**

- have fairly tolerance to high temperature
- Have considerable tolerance to tropical diseases
- can walk for long distances in search of pastures and water
- Have ability to survive on low quality pasture/forage.
- are able to survive on less amount of food/water without seriously affecting performance.

(4 ½ mks)

17. **Maintaining conditions in artificial incubation**

a) Proper ventilation:

- For air/oxygen circulation for embryonic gaseous exchange

-for air circulation to control humidity (1mk)

b) Relative humidity at 60%

-Low humidity causes embryonic mortality due to loss of moisture

-High humidity lowers hatchability and produces abnormal bigger chicks which look marshy. (1mk)

SECTION B

a) Appropriate milking technique

-A/ squeeze method (1mk)

b) Squeeze method

-Teat is grasped at base between the thumb and the index finger.

-The other fingers are sequentially tightened starting with index fingers to compress the teat so as to expel the milk into a container

-all fingers are relaxed finger and the thumb should hold the base of the teat firmly to prevent back flow of milk into glad cistern. (2 mks)

c) **Disadvantages of using wrong milking techniques**

-It is injurious and leads to formation of scar tissue/physical injury on the teat cistern

-The pulling effect leads to tearing of teat tissues making them more prone to bacteria invasion/mastitis.

-Chances of milk contamination are high because the application of milking salve/teat dipping becomes necessary for lubrication.

(2 mks)

19. a) **Parts labeled**

- B-Inner shell membrane
- C-outer shell membrane
- D-Albumen/egg white
- F- Chalaza

(2mks)

b)
- Texture/ smoothness of the shell
- Absence of cracks on the shell
- Cleanliness/absence of the shell
- Cleanliness/absence of blood stains
- Oval in shape.

(2mks)

c) Function of the part labeled E.

- Provides nutrients for the developing embryo/chick. (1 mk)

20. a) routine management practice:

-Hoof trimming **(1mk)**

b) Reasons for the practice:

-to prevent lameness/difficulty in walking

-To control foot rot

-To ease mating (2mks)

21. a) i) fowl pox/ cutaneous pox/avian pox

ii) Virus /avian pox virus (1 mk)

b) Other symptoms

-watery discharge through eyes and nose

-Difficult breathing and swallowing

-Dullness

-Loss of appetite

-Emaciation (2mks)

c) **Control Measures**

- Vaccination
- Removal killing of all affected birds
- Observe proper hygiene
- Isolation of affected birds (2mks)

22. a) - elastrator

(1 mk)

b) **Use of the equipment**:

- Stretching/enlarging/Operating the rubber ring during castration/dehorning/clocking.

(Reject Castration/dehorning/clocking as an answer) (1mk)

SECTION C 40 MKS

23 a) signs of ill-health

-Behaviour of the animal- aggressiveness, over excitement or produces abnormal sound

-isolating from others/photophobic

-animal movement-limping/lameness/strained gait

-General appearance: restless, dull, less alert or less response to touch/abnormal posture

-**skin/coat**: -ruffled/starry coat/loss or hair/dull skin/parts peeling off/cracking/wounds/lesions/swellings

-**Mucous membrane**:-dull red/pale /dry/ having copious discharge

-**Production /performance** level:-Sudden decline in production/performance/loss of weight and condition.

-Pulse rate:-radical departure from the normal range

-respiratory rate: abnormal deviation from the normal range

-**Body Temperature**: Abnormal temperature from the normal range/too high/too low

-**appetite and feeding**:-Increased/lack of appetite/abnormal chewing/swallowing/feeding on abnormal food substances

Urination:-abnormal urine colour matter in terms of consistency/smell/colour, difficult urination/less or high frequency

-profuse salivation

-lachumation

-**defaecation process**:-abnormal faecal matter in terms of consistency/smell/colour presence of parasite/egg segment/blood stains/frequency (10 mks)

b) **Process of digestion in anon-rumnant**

i) Mouth.

- food is chewed to break and increase surface area for enzyme action
- food is mixed with saliva which contains salivary amylase and lubricates the food
- salivary amylase converts starch to Maltose. (1 mk)

ii) **Stomach**

- Food is mixed with gastric juice/dilute hydrochloric acid

- Hydrochloric acid provides optimum PH for enzyme/ingested with food./converts pepsitrogen to pepsin
- Pepsin breaks down proteins to and peptones peptides enzyme/pepsin action
- Rennin coagulates milk to increase the surface for the enzymes/pepsin action

iii) **Small intestines**

- In the duodenum, food is mixed with bile and pancreatic juice (pancreatic amylase, lipase and typsin).
- Bile emulsifies fats to increase the surface area for enzyme action/bile has salt to neutralize acid from stomach.
- Pancreatic amylase converts fats to glycerol and fatty acids
- Trypsin converts proteins to peptones and peptides
- In the rest of small intestines, food is mixed with intestinal juice/erepsin/peptidase maltase, sucrose/invertase & lactase enzymes).
- Erepsin/peptidase convert peptones and peptides to amino acids
- Maltase converts maltose to glucose
- Sucrase(invertase) converts sucrose to glucose and galactose
- Digested food materials are absorbed in the ileum
- Undigested and indigestible food materials then move to the large intestines for further digestion. (6 mks)

24. a) **Benefits of using biogas**

- is a cheap source of energy
- requires low running/maintenance costs
- Is versatile/can be put to many uses such as lighting. Cooking, electricity Generation, etc
- does not pollute the environment/environmental friendly

- Is a sustainable/renewable source of energy?
- By products/fermented slurry is used as manure
- Income generating
- Raw materials locally available

b) **Advantages of using a subsoiler**

- It breaks hard pans
- It improves drainage/water infiltration
- It improves soil aeration
- It destroys deep rooted weeds
- It facilitates growth and development of root crops/deep rooted cups
- It loosens top soil without bringing the subsoil to the surface to ensure conversation/minimum fillage/least soil pulverization.

(5 mks)

c) **Factors affecting sitting of a bee hire:**

- Availability of water;- should be available within a 3 km radios to facilitate collection by bees.
- Availability of flowers:- should be readily available to facilitate collection of Pollen and nectar by bees.
- Noise and other disturbances: Place should be free from pests and diseases
- Dampness and bad odours: - site should be free from dampness and bad odours

(Factors 5x1)

(explanation 5x1) (10 mks)

25. a) **Life cycle of beef /pork tape worm:**

- Mature segments/prolottids full of eggs are dropped with human faeces

- Eggs are then released from the segments.
- Cattle/pigs ingest the eggs during grazing/feeding
- In the intestines, the eggs hatch into embryos
- The embryos penetrate the intestinal wall and enter the blood stream
- The embryos first localize in the liver
- From the liver, the embryos are distributed into the muscles in the body
- In the muscles, they become cysts/bladder worms/crysticercus cellulose
- Human beings get infected when they eat raw/ under cooked beef/pork with the cysts
- In the human intestines, the cyst wall dissolves, the bladder worms emerge and attach on the intestinal wall
- they then develop into adult worms and start laying eggs.

(Mark until the order is broken) (10 mks)

b) Process of egg formation

Ovary: Produces the ovum (1 mk)

Funnel/Infundibulum:

- Chalazae are added and the egg moves to the magmum.
- Fertilization takes place here
- receives ovum (1 mk)

Magnum:

- Light album is added and they yolk moves into the isthmus. (1mk)

Isthmus:

- Water mineral salts and vitamins are added
- Shell membranes are also added and the eggs moves to the uterus
- addition of albumen is completed (2mks)

Uterus/shell gland:

- Shell is added around the egg/it contains calcium deposits
- Shell pigmentation occurs here (3 x ½) (2mks)

Vagina:

- Egg is temporarily stored
- Egg is inverted to be laid with the broad end fist
- Egg is lubricated (2mks)

(Mark correct function and with correct part-ignore the order)

AGRICULTURE PAPER 1
SECTION A (30 marks)

1. Disadvantages of intensive system of farming.
   i) Requires high initial capital/Expensive
   ii) Is labour expensive
   iii) Requires high level of management/skilled labour (2 x $^1/_2$ = 1 mark)

2. 4 methods of farming.
   i) Shifting cultivation
   ii) Nomadic pastoralism
   iii) Organic farming
   iv) Mixed farming
   v) Agroforestry (4 x $^1/_2$ = 2 marks)

3. a) Nitrogen fixation
   - Process in which atmospheric nitrogen is converted to nitrates for plant uptake. (1 x 1 = 1 mark)

   b) Phosphorous fixation
   - Process in which phosphorous combines with other elements to form compounds that cannot be absorbed by plants. (1 x 1 = 1 mark)

4. 4 reasons for keeping livestock health records.
   i) Help in calculation of treatment and health costs
   ii) Help in culling/selecting livestock
   iii) Help in future diagnosis treatment and control measures
   iv) Help determine the common diseases and parasites/prevent diseases and parasites
   v) Help to support livestock insurance claims (4 x $^1/_2$ = 2 marks)

5. Relationship between scarcity and choice.

- Scarcity is where production resources are limited in supply relative to demand; therefore a choice has to be made on which enterprise(s) to allocate the limited resources. (2 marks - mark as a whole)

6. 2 reasons for land fragmentation.
   i) Buying/selling/paying debts/compensation
   ii) Inheritance
   iii) Settlement and resettlement
   iv) Gift/donations
   v) Shifting cultivation (2 x $^1/_2$ = 2 marks)

7. Advantages of individual tenure system.
   i) Easy to acquire credit.
   ii) Land disputes are minimized
   iii) Long term investment is encouraged
   iv) Incentive to conserve and improve land
   v) Easy to plan and make decisions
   vi) Easy to sell/lease whole or part of the land. (4 x $^1/_2$ = 2 marks)

8. 4 features for choosing powers
   i) Durability
   ii) Strength/ability to withstand pressure/thickness of the wall of the pipe
   iii) Diameter/size of the pipe
   iv) Workability/manoeverability of the pipe
   v) Colour (4 x $^1/_2$ = 2 marks)
9. 4 reasons for treating water.
   i) Remove chemical impurities/softening of water
   ii) Kill disease causing organisms/kill germs/pathogens
   iii) Remove bad smells and taste
   iv) Remove impurities of solid particles (4 x $^1/_2$ = 2 marks)

10. 4 Statutory Boards
    i) Kenya Sugar Board/Authority (KSB/KSA)
    ii) Kenya Tea Development Authority/Agency/Tea board of Kenya (KTDA, TBK)
    iii) National Cereals and Produce Board (NCPB)
    iv) Coffee Board of Kenya (CBK)
    v) Pyrethrum Board of Kenya (PBK)
    vi) Cotton Lint and Seed Marketing Board/Cotton Board of Kenya (CLSMB, CBK)
    vii) Horticultural Crop Development Authority (HCDA)
    viii) Kenya Sisal Board (KSB) (4 x $^1/_2$ = 2 marks)

11. 4 marketing functions of KCC
    i) Buying and assembling milk/collection
    ii) Processing milk
    iii) Market research
    iv) Advertisement/promotion of milk/milk products
    v) Strategic storage of milk products
    vi) Distribution of milk/transportation
    vii) Selling milk
    viii) Marketing and packaging

ix) Risk bearing
x) Financing - related to marketing function
xi) Grading/standardization
Rej: Marketing alone (4 x $^1/_2$ = 2 marks)

12.
i) Increases seed soil contact
ii) Compacts soil/seed to protect it against agents of erosion
iii) Crushing large soil clods
iv) Soil levelling (2 x $^1/_2$ = 2 marks)

b) Levelling
i) Ensures uniform depth of planting/uniform germination/uniform fertilizer application
ii) Ensures uniform water level in paddy
iii) Rice fields
iv) To remove depression which collect water leading to rotting of seeds.(2 x $^1/_2$ = 1 mark)

13. 3 activities in clearing land
i) Tree felling
ii) Stumping/removal of stumps/destumping
iii) Slashing/mowing (3 x $^1/_2$ = $1^1/_2$ marks)

14. 5 Advantages of zero grazing
i) Requires little land
ii) Quick accumulation of manure
iii) Easy to control diseases and parasites
iv) Less wastage of feeds
v) Has high stocking rate
vi) High milk yield
vii) Efficient use of fodder (5 x $^1/_2$ = $2^1/_2$ marks)

15. 4 factors determining stage of crop harvesting.
i) Intended use of the crop
ii) Chemical concentration of the produce/stage of maturity/change in colour
iii) Prevailing weather conditions
iv) Market demand for the produce/market price(4 x $^1/_2$ = 2 marks)

16. a) Growth Cycle
i) Annual weeds
ii) Biennual weeds
iii) Perennial weeds (2 x $^1/_2$ = 1 mark)

b)
i) Broad leaved weeds
ii) Narrow leaved weeds (2 x $^1/_2$ = 1 mark)

SECTION B (20 marks)

17. a) Weed
- Couch grass/*Digitaria scalarum* (1 x $^1/_2$ = $^1/_2$ mark)

b) Why its difficult to control.
- Presence of underground stems/rhizomes which are difficult to control/underground storage structure (1 x 1 = 1 mark)

c) 4 control
i) Uprooting
ii) Cultivation
iii) Slashing
iv) Use of herbicides
v) Mulching
Rej: Rogueing (4 x $^1/_2$ = 2 marks)

18. a) Soil Sample with highest acidity
- Sample S1 (1 x $^1/_2$ = $^1/_2$ mark)

b) Lowering pH
i) Application of acidic fertilizers: Accept S/A; ASN; DAP; MAP
Rej: Nitrogenous fertilizers
ii) Application of sulphur (2 x $^1/_2$ = 1 mark)

c) Soil sample suitable for tea growing
i) S_2
ii) S_3
iii) S_4

19.
i) Extraction to remove seeds from pods/fruits
ii) Drying to reduce seed moisture content
iii) Testing to verify seed quality
iv) Treatment to break dormancy/helps improve germination/soaking in water
v) Seed dressing to control pests and diseases
vi) Seed innoculation to improve nitrogen fixation
vii) Washing/cleaning to remove mucilage (4 x 1 = 4 marks)
No procedure

20. a) i) Correct pruning
- B
NB: Wrong identity
Wrong reason
(1 x $^1/_2$ = $^1/_2$ mark)

ii) Reason
- Slant cut is a few centimetres above the bud/leaf (1 x 1 = 1 mark)

b) 2 how pruning controls diseases
i) Removes diseased parts
ii) Creates unfavourable conditions/environment for disease agents
iii) Facilitates penetration of chemical sprays. (2 x $^1/_2$ = 1 marks)

21. KABURU FARM CASH ANALYSIS FOR JANUARY 2009 • No marks for title

RECEIPTS (SALES AND RECEIPTS) EXPENDITURE(PURCHASESAND EXPENSES)

Date	Description	Total	Cash	Livestock	Crop	Date	Description	Total	Crops	
Livestock										
	Ksh	Ksh	Ksh	Ksh		Ksh	Ksh	Ksh		
01/1/09	Cash in hand	30,000	30,000			15/1/09	Seeds for planting	7,500	7,500	
05/1/09	Livestock sales	80,000		80,000		20/1/09	Paid KFA for fertilizer	16,400	16,400	
08/1/09	Crop sales	50,000		50,000		25/1/09	Bought livestock	50,000		
50,000										
							feed			
31/1/09	Cash for milk delivery to KCC	120,000		120,000		30/1/09	Paid wages for planting & weeding	56,000	56,000	
						31/1/09	Transport charges for milk delivery	9,000		9,000
	TOTAL	280,000	30,000	200,000	50,000		TOTAL	138,900	79,900	
59,000										
							Closing balance/ cash at hand	141,000		
	TOTAL	280,000					TOTAL	280,000		

NB: Check for double entry

21. • Correct labelling of expenditure and receipt columns 1 x $^1/_2$ = $^1/_2$ mark
• Correct entries by dates 9 x $^1/_2$ = 4$^1/_2$ marks
• Balancing 1 x $^1/_2$ = $^1/_2$ mark

Closing balance

Cash at hand i.e 141,000

22. a) Figures 18:46 on a fertilizer bag mean

i) 18% Nitrogen (NO

ii) 46% phosphorous pentoxide (P_2O_5)

iii) 10% Potassium oxide (K2O) (3 x $^1/_2$ = 1$^1/_2$ marks)

b) Filler material

= 100 - (18 + 46 + 10)

= 100 - 74

= 26kg or 26%

Ignore working

Mark answer only i.e 26

Unit must be therefore a score. 1 x 1 = 1 mark

SECTION C (40 marks)

23. a) 8 Factors that encourage soil erosion.

i) Lack of ground cover exposes soil to agents of soil erosion/removal of cover crops

ii) Steep slopes increase the speed of surface run-offs hence erosive power of water

iii) Light/sandy soils are easily carried away by agents of soil erosion.

iv) Shallow soils are easily saturated with water and carried away

v) High rainfall intensity on bare ground/leads at detachment of soil hence run off

vi) Frequent cultivation/over cultivation pulverizes the soil making it easy to detach and carry away.

vii) Overstocking leads to overgrazing which destroys ground cover exposing it to agents of erosion.

viii) Burning/deforestation destroys vegetation cover and exposes soil to agents of erosion.

ix) Ploughing up and down the slope creates channels which speed up and increases the erosive it to agents of water.
x) Cultivation of river banks destroys riverine (Viparia) vegetation & destroys soil structure exposing it to agents of erosion.
xi) Cultivating the soil when too dry destroys soil structure making it easy to be eroded.
xii) Long slopes increases volume speed of run off hence increasing erosive power of water.
Question if filter not qualified = No mark
Factor & effect
xiii) High rainfall amount increase saturation of soil hence increase in soil erosion.

b) i) Mulching to conserve moisture
ii) Erection of shade to minimize evapotranspiration
iii) Weed control to reduce competition with seedlings for nutrients, light, space etc
iv) Pest and disease control to ensure healthy and vigorously growing seedlings
v) Pricking out/thinning to minimise competition for growth elements
vi) Fertilizer application to supplement nutrients in the soil
vii) Watering to ensure adequate moisture supply
viii) Hardening off/removing shade/reducing watering to acclimatize the seedling to conditions in the field.
ix) Removal of mulch immediately after germination
NB: Correctly stated (7 x 1 = 7 marks)

c) 5 soils factors that determine a crop growth in an area.
i) Soil drainage/rate of water infiltration and percolation through the soil
ii) Soil structure/arrangement of soil particles or aggregates/water holding capacity
iii) Soil nutrient content/variety and quantity of mineral nutrients in the soil/Soil fertility
iv) Soil profile/soil depth/depth and arrangement of soil horizons in relation to the rooting systems of the crop
v) Soil pH/chemical properties of the soil/degree of acidity or alkalinity of the soil solution
vi) Soil borne pests and diseases/the prevalent pests/diseases in the soil
vii) Water holding capacity
5 correctly stated (5 x 1 = 5 marks)

24. a) 5 effects of high temperature
i) Increases incidences of some pests/parasite and diseases
ii) Improves quality of certain crops e.g fruits, pineapples, papaws'
iii)Lowers quality of certain crops e.g pyrethrum
iv) Increases rate of evapotranspiration/wilting in plants
v) Increases rate of growth for early maturity in crops
vi) Limits distribution of exotic livestock breeds
vii) Lowers production in livestock
viii) Influences design of farm buildings and structures
ix) Lowers labour productivity (5 x 1 = 5 marks)

b) 4 precautions observed in cotton harvesting
i) Sisal bags/gunny bags should not be used to prevent mixing of lint and sisal fibres which causes ginning problems
ii) Hands should be cleaned to avoid staining of the lint
iii) Picking should be done when the lint is dry to prevent fibres from sticking together
iv) Use clean containers for picking

v) Use different containers for AR (Safi) and BR (fifi) gardens of cotton to ensure quality/separation
vi) Picking should be done immediately the bolls open/split to prevent staining by dust/dirt
vii) Avoid picking leaves & twigs to avoid (containers)
1 x 4 = 4 marks

b) Sugar cane harvesting
i) Harvest at the correct age / 13 -22 months for plant crop/ 12 - 18 months for rotation
ii) Take sugar can samples of testing to determine maturity.
iii) Cut the mature cane at the base/near the ground
iv) Cut off the green tops
v) Strip off green leaves/burn the cane
vi) Deliver the cane to the factory within 48 hours/immediately after cutting
vii) Use a cane harvesting machete. (6 x 1/2 = 3 marks)

c) 8 factors considered in farm planning
i) Risk and uncertainties: enterprises should be analysed to determine the risks and uncertainties involved.
ii) Security: enterprises which require more security should be sited near the farm house/provision of adequate security
iii) Land size: a large number of enterprises can be established on a large scale compared to a small scale farm.
iv) Current trends in labour market: to determine availability and cost of labour especially during peak period.
v) Farmers objectives and preferences: to ensure the farmer who is the operator has a sense of ownership of the plan and brings about motivation
vi) Current market trends and prices of outputs: to ensure consideration of enterprises with high profits returns.
vii) Availability and cost of farm inputs: to identify enterprises that are affordable and whose inputs are readily available.
viii) Government policy/regulation: to seek permission for enterprises undertaken on quota system e.g coffee growing and avoid enterprises and farming systems prohibited by the government
ix) Environmental factors: soil, climate and topography should be analysed to determine livestock crop enterprises that are suitable to the local ecological conditions.
x) Communication and transport facilities and facilitate movement of outputs to the market and supply of inputs. Also helps in conveying improved methods of farming and market trends.
xi) Availability of capital: to acquire farm inputs
xii) Possible production enterprises: should be identified and analysed so that suitable and profitable enterprises are selected
- Wrong factor
Award for explanation
1/2 mk - stating the factor = 1/2 x 8 = 4

25. a) 6 physical methods of controlling crops pests
i) Trapping/picking and killing the pests
ii) Use of lethal temperature to kill the pests
iii) Flood the suffocate and kill the pests
iv) Use of physical barriers e.g fences, rat guards, etc to keep the pests away from the crop/produce
v) Proper drying to make penetration difficult
vi) Use of explosive to destroy breeding grounds and the kill the pests

vii) Suffocation: carbon dioxide build up to suffocate pests in stores especially cyprus bins. (6 x 1 = 6 marks)

b) Field management of bulb onions
i) Weed control through shallow cultivation to avoid damage to the shallow inion roots
ii) Remove excess soil around the roots gradually to facilitate bulb expansion
iii) Water regularly at the early stages to ensure adequate moisture supply
iv) Top dress with nitrogenous fertilizer at appropriate rates
v) Control pests e.g thrips using appropriate pesticides
vi) Control diseases e.g rusts, mildews using appropriate method. (4 x 1 = 4 marks)

ii) Harvesting of bulb onions
i) Is done 4 -5 months after planting/when leaves wither/turn brown
ii) Cut break and bend this tops at the neck
iii) Harvesting is done by lifting/pulling/digging out the crop
iv) Leave the bulbs on the ground/undershade to dry for 3 days and turn frequently to ensure uniform drying.
3 x 1 = 3 marks

c) 7 factors influencing seed rate
i) Intended use of the crop e.g fodder maize requires high seed rate than grain maize.
ii) Germination percentage - high speed rate is required for seeds with low germination percentage
iii) Method of planting: Broadcasting requires high seed rate than row planting.
iv) Number of seeds per hole: two or more seeds per hole requires more seed rate than one seed per hole.
v) Soil fertility: poor/infertile soils require low seed are because crops are widely spread compared to fertile soils.
vi) Growth characteristics of the crop: tall/tillering/indeterminate varieties require low seed rate compared to short/less tillering/determinate varieties
vii) Spacing: High sped rate is required in closer spacing than wider spacing
viii) Seed purity: Impure seed/containing chaff and foreign materials will lead to high seed rate compared to pure seed
ix) Pure/mixed stand
High seed rate for pure stand and low seed rate for mixed stand.
$^1/_2$ mk for stated factor = $^1/_2$ x 7 = $3^1/_2$ mk
$^1/_2$ mk for explanation given = $^1/_2$ x 7 = $3^1/_2$ mk

AGRICULTURE PAPER 2
SECTION A (30 marks)

1. Causal agent of anaplasmosis disease in cattle
   - Protozoa/anaplasma marginate/anaplasma spp. (1 x 1/2 = 1/2 mark)

2. Materials used in constructing a Kenya Top Bar Hive (K.T.B.H)
   - Timber
   - Nails
   - Plain wire
   - Iron sheets (4 x 1/2 = 2 marks)

3. a) Breeds of dairy cattle that originated from the channel islands:
   - Guernsey

- Jersey (2 x 1/2 = 1 mark)

b) i) Chinchilla rabbit
- Grey/silvery (1 x 1/2 = 1/2 mark)

ii) Toggenburg
- Brown with two white stripes running down the face (1 x 1/2 = 1/2 mark)

4. Reasons for castration
   - Prevent uncontrolled mating/breeding
   - Improve the quality of meat
   - Promote faster growth/facilitate weigh gain
   - Make then docile
   - Control breeding diseases
   - Control inbreeding (4 x 1/2 = 2 marks)

5. Characteristics of roughages
   - Bulky
   - High fibre content
   - Low nutrient content
   - Low digestibility
   - Mainly of plant origin (4 x 1/2 = 2 marks)

6. Functions of the poultry digestive system.
   - Softening/moistening food
   - Temporary food storage (2 x 1/2 = 1 mark)

7. Roles of worker bees kills.
   - Kills the drones after mating the queen
   - Scouting for a new home
   - collect nectar/water/gum/propolis/pollen
   - Make honey combs
   - Protect the colony
   - Clean the hive
   - Make honey and bees wax
   - Seal the stacks and services (4 x 1/2 = 2 marks)

8. Reasons for controlling livestock diseases.
   - Reduces spread of livestock diseases/production of healthy young ones
   - Promote fast growth and early maturity - rej to maintain good health in livestock
- Make them have long productive life.
   - Improve quality and safety of products
   - Improve quantity of products
   - Reduce cost of production. (4 x 1/2 = 2 marks)

9. Control measures of fowl pox diseases in poultry.
   - Observe hygiene in poultry house
   - Regular vaccination
   - Slaughter and properly dispose carcass of affected birds - rej culling, killing atone
   (2 x 1/2 = 1mark)

10. a) shovel
    - Mixing mortar/manure
    - Lifting soil/manure (1 x 1/2 = 1/2 mark)

    b) Strip cup
    - To detect mastitis infection in milk. (1 x 1/2 = 1/2 mark)

11. Reasons for maintenance practices.
    - For safety of the user/operator
    - Ensure efficiency of operations
    - Increases durability
    - Reduces costs on repairs and replacements
    - Avoid damage to the mower. (3 x 1/2 = 11/2 marks)

12. Limitations of using solar power
    - Solar trapping devices are expensive
    - Power supply/trapping fluctuates depending on weather conditions
    - Solar trapping is limited to day light
    - Requires skilled labour to handle the devices (3 x 1/2 = 11/2 mark)

13. Importance of thermostat
    - Prevents engine from over-heating
    - Maintains optimum engine temperature during operation (1 x 1 = 1 mark)

14. Advantages of disc plough over a mould board plough
    - Discs roll over obstacles
    - Requires less draught power
    - Requires less maintenance costs
    - Works better on dry, hard and sticky soils (2 x 1/2 = 1mark)

15. Tools used when laying concrete blocks during construction of a wall.
    - Plumb bob/plumb line
    - Mason's trowel
    - Spirit level/pipe level
    - Wood float/steel float
    - Masons square
    - String/masons line/line (4 x 1/2 = 2 marks)

16. Importance of guard rails in a farrowing pen.
    - Prevents sow from crushing piglets rej. trampling of piglets
    - Prevents sow from eating creep feeds (1 x 1 = 1 mark)
17. Reasons for having foot bath in a cattle dip.
    - Clean the feet of animals
    - Control foot rot (2 x 1/2 = 1 mark)

18. a) Crutching and ringing
    - Crutching is the cutting of wool around the external reproductive organs of a female sheep to facilitate mating
    - Ringing is the cutting of wool around the sheath of the penis in rams to facilitate mating. (Mark as a whole 2 marks)

b) Cropping and harvesting
- Cropping is the selective removal of fish of marketable size from the pond.
- Harvesting is the removal of all the fish from the pond. (Mark as a whole 2 marks)

19. Ways in which infectious diseases can spread
- through vectors
- through ingestion of contaminated food and water/through food and water
- Through contact
- Through inhalation of contaminated air/through air. (3 x 1/2 = 11/2 marks)

SECTION B (20 marks)

20. a) Causes of chicks' behaviour in the illustrations A, B and C
A Presence of draught makes the chicks to crowd on one side of the brooder
B Cold/inadequate heat makes the chicks to crowd around the heat source
C High/Excess heat makes the chicks to move away from the heat source (3 x 1 = 3 marks)

b) Reasons for making brooder wall round in shape
- To discourage overcrowding of chicks at the corners to avoid suffocation. (1 x 1 = 1 mark)

21. a) F - Cervix
H - Oviduct/Fallopian tube (2 x 1/2 = 1 mark)

b) Presence of part labelled G
- Produces ova/female gametes
- Products hormones that control ovulation cycle/estrogen cycle 2 x 1 = 2 marks

c) Role of J
- Allows implantation of the zygote and development of the foetus.
- Contracts to expel foetus
- Implantation of the foetus (1 x 1 = 1 mark)

22. a) K - Beef tapeworm/Taenia saginata/Taenia spp rej tapeworm
L - Roundworm/Ascaris lumbricodes/Ascaris spp (2 x 1/2 = 1 mark)

b) Bladder worm/Embryo Cyst/Cystococus cellulase/cyst (1 x 1/2 = 1/2 mark)

c) Procedure of handling a heifer when administering a liquid deworming drug.
- Restrain the heifer in a crush
- Hold it by the nostrils and lift up its head
- Open its mouth
- Release the drug into the mouth as far back as possible/place the drenching gun/bottle on the mouth
(Mark until the procedure is broken 21/2 marks
5 x 1/2 = 21/2 marks)

23. a) Granary/modern store/crib (1 x 1/2 = 1./2 mark)

b) Function of M
- Prevents entry of rodents into the store.
- To keep off vermins (1 x 1/2 = 1/2 mark)

c) Maintenance practices on the structure

- repair and replace worn out parts
- Cleaning
- Fumigating/dusting with appropriate pesticides. (2 x 1/2 = 1 mark)

a) N - Tank
P - delivery note rej. hose pipe/hose alone
Q - trigger
R - Lance

b) Function of S
- Breaks the liquid chemical into desired size of droplets/spray form/fume droplets/jets (1 x 1 = 1 mark)

25. a) Dairy breed (1 x 1/2 = 1/2 mark)

b) Friesian/Jersey/Guernsey/Ayrshire (1 x 1/2 = 1/2 mark)

c) Physical characteristics of dairy cattle
- Wedge/triangular shaped
- Straight topline
- Large and well developed udders teats
- Prominent milk veins
- Lean bodies/thinly fleshed waters
- Large stomach
- small head and long neck
- Well set wide hind quarters
- Prominent/visible pin bones
- Long thin legs

26 a) Advantages of artificial insemination
- Controls breeding diseases/parasites
- Controls breeding
- Is a quicker method of obtaining a proven bull
- Is easy and cheap to transport semen to far areas
- Semen from a superior bull can be used to serve many cows
- Farmers who cannot afford to buy a superior bull can access the service at a low cost
- Bulls that cannot serve naturally due to physically injuries/defects can be utilized.
- Prevents injuries to cows by heavy bulls
- Danger of injury/damage by aggressive bulls is eliminated
- Semen can be stored for a long period even after the death of the bull
- Saves the cost of rearing a bull
- Controls in breeding
- It is a useful research tool. (5 x 1 = 5 marks)

b) Signs of Trypanosomiasis (Nagana) disease in livestock
- General body weakness/dullness
Reduced milk production
- Swollen lymph nodes
- Rough coat and cracked skin where there is no hair
- Running eyes/lachrimation which can result in blindness/sunken eyes
- Diarrhoea

- Emaciation/loss of weight
- Loss of hair toward the tail end
- Abortion in pregnant females
- High fever/temperature
- Anaemia
- Loss of appetite
- Swollen parts of the belly (10 x 1 = 10 marks)

c) Functions of water
- Component of body cells and many body fluids e.g blood
- Used in biochemical reactions in the body e.g digestion
- Regulates body temperature through sweating and evaporation
- Excretion of metabolic wastes from the body
- Formation of products e.g milk, eggs etc
- Makes cells turgid to maintain their shape.
- Transportation of nutrients from one part of the body to another (5 x 1 = 5 marks)

27. a) Use of the various parts of a zero grazing unit in dairy farming.
- Milk recording room - weighing and milking records
- Milking stall - rearing calf to weaning
- Calf pen - rearing calf up to weaning
- Sleeping cubicles - provide shelter and warmth
- Loofing area - dunging, feeding, exercise and sunning
- Feed and water troughs - feeding and watering the animals
- Feed preparation room - preparing feed rations and cropping fodder rej. chaff cutter region
- Store - storing/keeping dairy equipment/feeds
- Manure storage areas storing measure

Parts is tied to the function
6 x 1 = 6 marks

b) How power transmitted from a tractor engine is made available for use on a farm.
i) Propeller shaft
- connects gear box to the differential which has wheel axles
- Wheel axles rotate to move the tractor and push or pull trailed implements.

(2 x 1 = 2 marks)

ii) Power take Off (P.T.O) shaft
- Rotates at the same speed as the crankshaft.
- Its connected to machines e.g mowers, sprayers, shelters etc to perform farm operations (2 x 1 = 2 marks)

iii) Hydraulic system
- Is attached to the three-point linkage or attached on hydraulic mechanism trailer.
- the three point linkage operates (raises/lowers) the mounted implements during farm operations or for off loading (2 x 1 = 2 marks)

c) Ways in which ticks can be controlled
- Burning infested pastures to kill developmental stages. (1/2 mark for stating)
- Rotational grazing to starve and kill developmental stages. (1/2 mark for sta
- hand picking and killing the ticks.
- Fencing off pasture land and farm to keep away infested animals/double feeding re. fencing al

- Ploughing pasture land to burry and kill developmental stages.
- Top dressing pasture using lime to kill the ticks.
- Spraying using acaricides/had dressing/dipping to kill ticks.
- Use of natural enemies - eat the
- self licking - dislodges ticks from the body. (8 x 1 = 8 marks)

28. a) Characteristics of a poor layer.
- Combs and wattles - small/shrivelled/shrunken. dry scaly and place.
- eyes - dull and pale yellow.
- Beak - yellowish in colour.
- Abdomen/breast - hard and full
- Vent - round, dry and less active
- Space between keen and pelvic bone - small and fits only one or two fingers
- Plummage - preened & glossy (smooth) beautiful
- Moulting - early morning
- Shants/feet - Yellowish n colour
- Broodiness - Is common/early moulting
- Temperature - easy and dull

Mark as whole
Accept - poor layer is inactive. (10 x 1 = 10 marks)

- Free from disease causing micro-organisms/pathogens
- Free from hair, dirt or dust.
- Free from bad odours and tastes/has good flavours.
- Chemical composition within expected standards. (3 x 1 = 3 marks)

ii) Factors influencing milk composition
1) Age of animal
- Butter fat in milk becomes less as an animal grows old thus young animals produce milk with higher BF than older animals.
1) Breed differences rej. species of the animal
2) Different breeds of cattle produce milk with differing percentage composition e.g Jersey produce higher BF than Friesian.
3) Type of wood eaten by an animal
Roughage feeds produce link with higher fats, lactose and protein compared to grains.
4) Diseases
Diseases such as mastitis reduce the lactose composition in milk because bacteria attack milk sugars.
5) Physiological condition of the animal.
Sick/extremely emaciated animals register low percentage of BF/during late pregnancy cows produce milk with low BF content.
-6) Stage of lactation
The BF content in milk is highest at the middle phase of the lactation period and lowers towards end of lactation.
7) Completeness of milking
Milk drawn last from udder during contains high BF content/last drop milk has BF content produce in the milk.
8) Season of the year - accept environmental condition
BF content increases during cold seasons.
9) Time of milking
- Milk produced in the morning has a lower BF content than milk produced in the evening

1/2 factor method
1/2 mk explanation (7 x 1 = 7 marks)

AGRICULTURE P1
2011

SECTION A (30 MARKS)

(a) Field management practices

-thining
-gaping (2 x ½ marks) =(1 mark)

(b) (i) Thinning: - Removes the excess seedlings from the field. (½ marks)
(ii) gaping - replaces seedlings /seeds that died/failed to germinate (½ marks)

2. (a) Variable costs

Wages for casual labour
Costs of food and water
Costs of drugs /chemicals/treatment (2 x(½ marks) =(1 mark)

(b) Fixed costs
Land rent/house rent
Salaries of regular/permanent labour Depreciation of machinery
Interest on borrowed loan.
Cost of equipments

(2 x(½ marks) =(1 mark)

(1 mark)

3. Disadvantages of monocroping

high risk of total less incase-of crop failure.
Under utilization of some soil nutrients
Build up of crop crop pests and diseases/weeds

Only specific mineral nutrients are absorbed /exhaustion of certain nutrients from the soil
Results in soil erosion in crops with poor ground coverage
Faster spread of pests and diseases.

(4 x(½ marks) =(2 marks)

4. Reasons for early land preparation.
Allows time for organic matter to decompose and form humus.
Facilitates timely subsequent operations.
Allows time for weeds to die /dehydrate
Allows weathering of soil clods before subsequent operations
Minimizes competition for labour
Allow pests and diseases causing organisms to starve and die,
Allows soil aeration /gaseous exchange to take place

Allow s water infiltration (1½ marks)

How crop rotation controls weeds

Crops associated with specific weeds are alternated with crops of different families to remove the appropriate host and break the life cycle of weeds.
Alternating with cover crops smoothers the weeds (2 x ½) 1mark

Qualities of a mother plant

Disease/pest resistant/tolerant.
Healthy/free from pests/diseases
High yielding
Well adapted to the environment/local ecological conditions.
Fast growth

(4x ½) 2mark

Factors on the choices of labour

Availability of labour
Size of the enterprise
Financial ability of the farmer/cost of labour
Type of the enterprise/type of the work

(a) Balance sheet

--showing the financial position of the farm business at a particular period of the year (½ mark)

(b) inventory

Recording all the assets owned by the farm business.

(c) cashbook

Recording book all transaction is involving receiving and paying out of cash on the farm

Functions of the A.S.K.

Holding competitive AGRICULTURA SHOWS/trade fairs /exbitions of livestock, crop and farm produce
Encouraging breeding and importation of pure breeds and improvement of indigenous livestock
Encouraging and assisting in official milk recording scheme.
Organising the running of Young Farmers Clubs.
Organising the National ploughing Contest

Publishing the Kenya stud book
Publishing the monthly journal "the kenya farmer"
Awarding bursaries for local and over seas studies/tours for its members (4 x ½) 2marks

10. Leaching;-

Washes dissolved mineral nutrients to the lower soil horizons beyond the reach of plants
(1x ½ mark) 1mk

11. Reasons for imposing quarantine

To test them for purity to prevent entry of noxious/foreign weeds into the country,
To test them for purity to prevent entry/spread of pests and diseases into the country;
Quality control (1x ½ mark)

12.methods of controlling bean anthracros disease

Use of certified seeds
Use of appropriate fungicides/chemicals
Crop rotations
Use of resistant varieties
Field hygiene/destruction of infected crop residues.
Rogueing ($4x^1/_2$) (2 marks)

13. post harvest practises

-threshig/shelling
-drying
-cleaning
-winowing
-sorting
-grading
-dusting
-parkage/bagging/parking
processing

($4\ x^1/_2$)
2mks

14. Non-competitive markets

Monopoly/monopolistic markets
Oligopoly/Oligopolistic markets
Lonopsony/monopsonisnc markets ($2x^1/_2$)
1mks

15. Settlement schemes

-Jet schemes
-Haraka schemes
-Shirika schemes
-Lari settlement schemes
-The squatter's settlement schemes
-Harmbee settlement schemes

16. (a) poisonus
-thorn apple/*Datura stramonium*
-sodom apple/*solanum inciunum*
-Tick berruy

(b) stains milk when eaten

Mexican marigold *Tagetes minuta*

17. AGRICULTURAL support services

Credit services
Marketing services
Agricultural machinery services
Agricultural research services
Farm input supply services (4x ½) 2mks

18. methods of harvesting trees

-coppicing cutting bark
-lopping/side pruning
-pollarding
-thinning

19. maintenance practices for trees

-protection when young/seedling
-pruning
-training
-grafting/top working
-watering
-shading
-weed control
-pest/disease control
-gapping

SECTION B 20 MARKS

20 (a) chiting/sprouting

(c) procedure of chiting

-Arrange the setts/tubers ia a store/with the rose-end facing upwards..
-Tubers are arranged 2-3 layers deep.
-Allow diffuse light through the store,
-Dust (spray)the setts/tubers with an appropriate insecticidyto control pests/aphids/tubermoths
- Sprinkle sorlie water on tubers if the conditions are dry.

21. (a) To-demonstrate the presence of living organisms in the soil. (1 x 1) (1 mark)

b) observation

Flask C

Lime water turns white/milky,/white precipitate

Flask D
No observable change /lime water remains clear

(c) Reasons for the answers in (b) above C

FLASK C

Lime water turns whits because living organisms exhaled carbon (IV) oxide which reacted with calcium hydroxide to form a white precipitate (calcium carbonate)

Flask D

The heating of the soil killed the soil living organisms and no respiration occurred to produce carbon (IV) oxide. (1 mark)

22. The law illustrated

(a)

Law of diminishing returns.

(b) phase II

Each additional unit of fertilizer leads to a lower increase in total output of maize than the previous unit of fertilizer input (1x1) 1mk

Phase III

Each additional unit of fertilizer input leads to a decrease in total output of maize.
(1 x 1)

(1 mark)

(c) Importance

- Helps the farmer to identify the level of optimum fertilizer application in the production of maize. To determine the highest level of maize output (cattle)
(1 x 1) (1 mark)

23.

Profit and Loss account of Makueni Farm for the year ended 30th June 2008

Expenditure Purchases & Expenses	Ksh.	Cts	Income Sales & receipts	Ksh.	Cts
Opening Valuation	80,000	00	Sales and Receipts		
Purchases and expenses			Rent received	10,000	00
Tractor repairs	30,000	00	Egg Sales	60,000	00
Tax paid	40,000	00	Maize sales	55,000	00
Interest on loan	20,000	00	Debts receivable	100,000	00
Purchase of inputs	90,000	00	Closing Valuation	90,000	00
Total	260,000	00	TOTAL	315,000	00
Net Profit	55,000	00			
	315,000	00		315,000	00

Award marks

1 Title - Profit and loss account for the year ended		½ mark
2 Expenditure Column Purchases & expenses	(1 x ½)	½ mark
3 Income column Sales and receipts	(1 x ½)	½ mark
4 Correct entries in each column	(2 x ½) (mark as a whole)	1 mark
Correct profit	(1 x ½)	½ mark

4. (a) Paddocking / Rotational grazing
(1 x ½)

(½ mark)

b) ADVANTAGES

Reduces build up of crop pests and diseases,
Allows pasture to regrow before being grazed again;
Manure is evenly distributed in the field
Excess pasture can be conserved
Allows management practices on ungrazed portions e.g. reseeding, fertilizer application /weed control /irrigation /pest and diseases control
Ensures maximum utilization of pastures.

(5 x $^1/_2$) ($2\ ^1/_2$ marks)

25. (a) **The weed**
Wild oat/*Avena sterilis* (1x $^1/_2$) $^1/_{2\text{mark}}$

(b) **harmful effects**
Competes with crops for nutrients/light/space/water
Acts as an alternate host for pests/diseases
Lowers quality of produce
Increase cost of production
Lowers yields (2 marks)

SECTION (40 marks)

(a) Water treatment to remove solid impurities.

- At intake, water is passed through a series of sieves with different sizes of holes to .trap large solid particles. leaves, grass., sticks polythene stones
- Aluminium sulphate (alum) is added to water in the mixing chamber to
- Water is passed to a large circular coagulation tank where soil particles settle
- Water is the passed through a filtration tank where all the remaining solid particles are removed,
- The layers of sand and gravel in the filtration tank allow water to seep through very slowly and leave all the solid particles behind.

(5x1) (5 marks)

(b).Farm records that should be kept by a dairy farmer

Feed records:- They show the type of feeds and quantities given to animals at a given tyme
Breeding records ;-they show details of breeding partens of uarius animals in the farm/date of service/pregnancy diagnosis/expected calving date/sex of the calves and the sire
Labour records ;-Shows the number of workers /their grades/salaries/responsibilities and performance on the farm

Health records ;-shows incidences of disease/animals attacked/treatment given/response and control measures taken

Milk records:- shows the total milk yield from individual cows the quality of milk in terms of butter contents is also shown for every cow on the farm

marketing records;- shows the quantity of milk sold and the price per litre kilogram.
Also show me revenue earned from milk per given period of time/day/ /monthly year

Inventory records:- Show all the assets buildings' machinery, land livestock
Consumable goods owned by the farmer

5 marks

(c) **cabbage production**

(i) Seedbed preparation
Land should prepared early during the dry season /land should be cleared
Land should be prepared to minimum tilth
Holes are dug at a depth of 10cm and spacing of 0.9x0.6m for large varieties and 0.6x0.6m for smaller varieties. (3x1) (3 marks)

(ii) transplanting of seedlings

- Nursery is first watered so that seedlings can be lifted with ease.
- Only healthy and vigorous seedlings should be selected.
- Lift the seedlings with a lump of soil attached to the roots
- Add about 15 gm/1 teaspoonful of phophatic fertilizer to the planting hole/mix with soil
- Firm the soil around the base of seedlings
- Water the seedlings as appropriate/if necessary
- Apply mulch around seedling/erect shade if necessary.
- Transplanting should be done on a cloudy day or late in the evening when it is not too hot.

7x1 7mks

(a) effects of pests on maize in the field

- Some pests transmit crop diseases e.g. leaf hoppers.
- Some pests eat the growing points causing retarded growth e.g. livestock, stalkborers
- Some pests attack the fruits lowering their quality andQuantity e.g birds
- Some pests eat the foliage/leaves reducing the surface area for photosynthesis.
- Some pests damage crop roots causing wilting and death to the plants e.g. termites
- Some pests pierce and suck sap from the plant depriving the plant of food
- Some pests injure and cause wounds on the plant exposing it to secondary infections

Procedure of harvesting pyrethrum

- Pick flowers selectively/
- Pick flowers with horizontal petals (ray flowers with 2-3 rowsof disc florets open
- Use the fore finger and the thumb
- Tick by twisting the heads so that no stem is left attached

- Put the picked flowers in woven basket. 4x1 (4mks)

Precautions during harvesting of pyrethrum.

- Picking starts after 3-4 months of planting to maintain quality
- Picked flowers are put in woven baskets to allow ventilation and avoid fermentation of flowers
- Wet flowers should not be picked because they heat up and ferment
- Picked flowers should, not be compacted to avoid heating up and fermenting .
- A suitable picking intervals maintained to avoid harvesting overblown flowers (3x1 3 marks

(c) cultural methods

- Contour farming: Cultivation and planting done across the slope helps in holding water thereby increasing infiltration and reducing runoff

- Mulching covers the soil thereby reducing splash erosion/reduce speed of runoff.
- Strip cropping alternating strips of crops that give good soil cover with those that give little soil cover controls movement of soil particles thereby helping in control of erosion.
- Vegetated_watarways: vegetation in waterways slows down run off/traps eroded soil particles Hereby preventing further erosion.
- Afforestation/reafforestation trees, protect soil from splash erosion by atomising - raindrops/encourage water infiltration/protect soil from winds, which could detach and remove soil particles,
- Inter-cropping crops which do not cover soil with crops that have good ground cover
- Minimum tillage so as to maintain good soil structure/have a seed bed with rough surface such that .soil particles are not easily detached encourage water percolation
- Cover cropping: establishing a crop that spreads over the surface of soil thereby protecting soil from effects of raindrops.
- Grass strips filter strips are left between cultivated/cropped strips of land to reduced speed of water and filter out eroded soil

(7 x 1) (7 marks)

(a) Biotic factors that influence crop production

- **Nitrogen fixing bacteria:** - convert atmospheric nitrogen to nitrates for plant uptake
- **Pollinators:-** transfer pollen grains from the anther of a flower to the stigma of the same flower or different flower.
- **Decomposers;-** organisms which breakdown organic plant and animal remains to release nutrients for plants/aerate the soil

- **Pests:-** Attack crops by eating plant parts, piercing and sucking sap and introduce/spread disease causing micro-organisms

- **Pathogens;-**they cause diseases
- **Predators;-**reduce pest population
- **Weeds;-**compete for nutrients/space/light/moisture/spread pests/suppress growth

(5 marks)

(b) Preparation of stem cutting

- Select shoots from mother plants that are high. yielding/healthy/well adapted
- Select healthy and vigorously growing shoots;
- That have grown unchecked for 6-months.
- Obtain cuttings from the middle part of the shoots,
- Using a sharp knife make cut close to the axial bud
- The cut should face away from the bud
- Put the cuttings in water before planting to prevent dehydration.
- The cut should have a single leaf bud
- Make a slanting cut
- The cuttings should be 2.5-4cm long

(c) Properties of N fertilizers

- Highly soluble in soil water therefore should be applied in an already established crop.
- Have short residual effect, thus should be applied frequently.
- They have a scorching scorching effect burning effect therefore should not come into contact with the plants.
- The fertilizers are hygroscopic/absorb moisture from atmosphere therefore it should be stored in dry conditions
- The fertilizers are corrosive therefore they should not be handled with bare hands/stored in easily corroded containers
- are easily leached therefore they should be applied to a vigorously growing crop/already established crop
- The fertilizers are Volatile therefore they should be applied on moist soils.

6x1 (6marks)

Agriculture 2011

pp2 marking schemes

1.Maintenance practices for a disc plough.
- cleaning after use
- painting the frame
- greasing the moving parts.
- repair/replace broken/worn out parts.
- metal parts on long storage.
- proper storage. (4 x ½ =2 marks)

2. Selection of breeding stock.
- Progeny testing.
- Mass selection.
- Contemporary comparison. (3 x ½ = 1 ½ marks)

3. Advantages of using animal power.
- Animals are cheap to acquire.
- Require less skilled labour.
- Can be used on,small holdings.
- Are appropriate in very steep areas. (4 x ½= 2 marks)

4. (a) Blue ticks - Anaplasmosis
(b) Brown ear ticks - E.C.F,
(c) Tsetse flies - Trypanosomiasis (nagana) (3x ½ =1 ½ marks

5. Control methods for roundworms.
- Use of antihelmintics
- Rotational grazing
- Proper disposal of faeces/hygiene
- Ploughing/burning of. -pasture. (4 x ½ =2 marks)

6. (a)Disease; Any deviation or alteration in the state of animal body or its organs which interferes with proper performance of its functions.

(b) Vaccination: Is the administration of a weakened or killed disease causing agent into the animal to induce production antibodies for immunity against the disease. (2 x1 =2 marks)

7. Maintenance practices for a battery.

- Topping with distilled water to maintain correct level of electrolyte.
- Cleaning the terminals and smearing them with grease to prevent corrosion.
- Tightly fix the battery in a box to prevent spillage and damages
- Regular charging.
- Empty contents and turn it upside down on long storage.
- Should be fitted correctly on the tractor. (3 x ½ = 1 ½ marks)

8.

	Breed	Type
(a)	Aberdeen	Beef
(b)	Guernsey	Dairy
(c)	Sahiwa	Dual purpose
(d)	Red poll	Dual purpose

4 x ½ =2 marks)

9. Proper nutrition
   - Prevents nutrient deficiency diseases.
   - Ensures resistance against disease infection. (2 x ½ = 1 mark

10. Categories of livestock disease;.
    - **Bacterial**
    - Protozoan
    - Viral
    - Nutritional (4 x ½ = 1 marks)

11. • Upgrading
    • Cross breeding. (2 x ½ =1 mark)

12. Bloodless castration methods.
    - Use of rubber ring and elastrator.
    - Use of burdizzo.

13. (a) Recessive gene; An allele whose phenotypic expression is masked by a dominant allele in heterozygous condition.

    (b) Epistasis: Gene interaction in which the expression of some alleles is blocked (masked). 2 x 1 =2 marks)

14. Signs of kindling in a doe.
    - Nest building
    - Plucking of fur From the belly
    - Lose of appetite.
    - Restlessness. (4 x ½ = 2 marks)

15. Developmental stages of liver flukes in a fresh water snail.

- Sporocyst.
- Cercaria
- Redia. (2 x ½ = 1mark)

16. Four strokes of a tractor engine
    - Induction
    - Compression
    - Power
    - Exhaust (4 x ½ =2 marks)

17.Signs of mite attack in poultry,

- Irritation/scratching of the body.
- Anaemia,
- Presence of mites below the plumage in patches.
- Falling off of feathers.

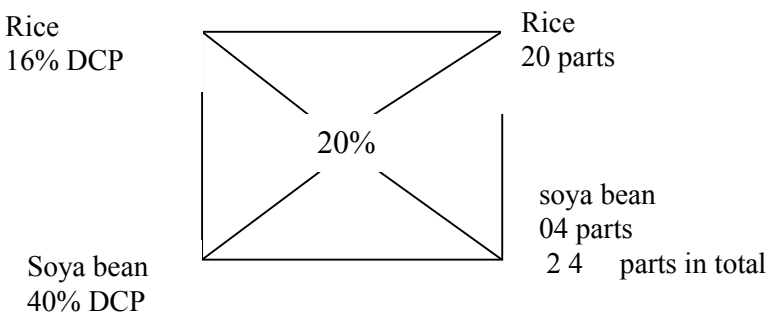
'Dermatitis due to burrowing effects.

- Formation of crusts. (4 x ½ = 2 marks)

18.Advantages of natural feeding in calf rearing.
- Calf takes milk at body temperature,
- Milk is free from contamination
- it prevents scouring in calves.
- Milk is provided ad libitum. (3 x ½ = 1 ½ marks)

Section B (20 marks)

19



Rice - $^{20}/_{24}$ x 100 = 83.3 kg

Soya bean - 4/24 x 100 = 16.7 kg (8 x ½ = 4marks)

20. (a) Dromedary(*camelus dromedarius)*
    (b)
    - Milk
    - Meat
    - Transport services

- Hides

(c)
- Withstands/resists high temperature.
- Can slay for along time without food water.
- Can resist tropical diseases.
- Can survive on poor pastures.
- Can walk long distances in search of food and water. (2 x 1 marks)

21. (a) J — watering can.
K— milk churn/milk can.
M — Mason's Trowel. (3 x ½ =1 ½ marks)

(b) K — temporary storage of milk/holding milk during transportation.
L — driving nails into wood/removing nails from wood. (2 x 1 =2 marks)

(c)
- cleaning after use.
- painting with aluminium paint to prevent rusting.
- repair/replace broken/worn out parts. (2 x ½ = 1 mark)

22. (a) Dry cow therapy. (1/2 mark)

(b) At the end of drying off. (1/2 mark)

(c)
- teal dipping
- complete milking
- proper milking technique
- applying milking jelly after (2 x 1 = 2marks)

23. (a) N - abomasum

P - Rumen

Q - Gall bladder (3 x ½ = 1 /2marks)

(b.) S — Digestion/absorption of food

T— Absorption of water. (2 x 1 = 2 marks)

(c) R— Lipase/Trypsin/amyIase

S — Peptidase/maltase/sacrase (invertase)/lactase. (2 x ½ = 1 mark)

SECTION C

24. Factors considered when culling livestock.
- Cull livestock of:
- Poor health;
- Old age;
- Physical deformities;
- Hereditary defects;
- Infertility;
- Poor mothering ability
- Poor quality pro duels;
- Low production;
- Bad temperament. (1 X 5 = 5 marks)

(b) Description of poultry management under:

(i) Cause of stress.
- Any sudden change in routine
- parasite infestations
- Lack of food and water
- Strangers and predators in the birds' house.
- Sudden noise such as passing tractors and thunder.
- Poor handling of birds during routine practices.
- Overcrowding which leads, to competition for space.
- Climatic changes
- Poor lighting in poultry house.
- Inadequate laying nests. (1x 8 = 8 marks)

(ii) control measures for cannibalism

- Control external parasites.
- Keep birds busy by hanging green leaves or vegetables in the house.
- Feed the birds on a balanced diet.
- Provide adequate floor space.
- Provide adequate laying nests.
- Provide dim lights in the brooder.
- Keep birds as per the age group.
- Debeak hens which peck others.
- Cull perpetual cannibals. (7 x 1 = 7 marks)

25. Feeding Dairy Calf
- Train the calf to Iced from a bucket (bucket feeding)
- Ensure the calf suckles the cow within the first eight hours to get colostrum.
- Feed the calf on colostrum for the far the first 4 days
- Introduce the feeding of whole milk or milk substitutes after, the fourth day
- Feed the calf 2 - 3 times per day for the-first-4 weeks.

- Feed the calf on the correct amount of milk up to weaning time.
- Provide adequate clean water from the third week,
- Feed the calf with warm milk at regular intervals.
- Introduce palatable, dry feeds such as concentrates (calf pellets) and good quality cut grass from the third week.
- Provide mineral supplements or licks.
- Any change in feeding should be done gradually to avioid nutritional disorders.

(10 x 1 =10marks)

(b) Newcastle disease. \

(i) • Casual organisms
• virus. (1 x 1 =1 mark)

(ii) Signs of attack:

• Difficult in breathing.
• Beaks remain wide open and necks are strained
• Dullness.
• Birds stand with eyes closed all the time.
• Loss of appetite.
• Nasal discharge which force the birds to shake their heads to clear it.
• Birds walk in a staggering motion since the nervous system is affected.
• Often the bird have their heads and wings drooping,
• Birds produce watery greenish diarrhoea.
• Eggs laid have soft shells. (1 x 7 = 7 marks)

(iii) Control Measures:
• Vaccination during the first six weeks and then two to three months later.
• Quarantine.
• Kill the infected birds and burn them.
• Obtain stock from reputable source. (1 x 2 = 2 marks)

26 . (a) Use of fences in the farm:

• Mark boundaries.
•Help to avoid boundary disputes
• Keep off wild animals and intruders from outside the farm.
• Enable the fanner to practice mixed farming.
• Facilitates rotational grazing
• Controls movement of animals and people preventing formation of unnecessary paths in the farm.
• Control the spread of parasites and diseases by keeping off wild and stray animals the farm.
• Help the farmer to isolate or confine animals requiring special attention.
• Enable the farmer to control breeding by rearing different animals in different paddocks.
• Hedges act as windbreakers.
• Adds beauty to the farm,
• Add value

- For privacy. (10 x 1 = 10 marks)

(b) Harmful effects of liver flukes in sheep
- Digestive upsets due to blocking of bile duct.
- Emaciation/recumbency lending to death
- Anaemia due to destruction-of-liver tissues
- Swollen lower jaw/Oedema in the jaws.
- Swollen abdomen. (5 x 1 = 5 marks)

(c) Differences between Petrol and Diesel Engine.

Diesel Engine	Petro Engine
- Uses diesel	- Uses petro
- Ignited by compression	- Ignited by spark plugs
- Compression ratio is high	- Compression ratio is low
- Less efficient in fuel burning	- More efficient in fuel burning
- Only air is compressed	- Air-fuel mixture is compressed
- Has injector pump	- Has acubator

(5 x 1 = 5 marks)

AGRICULTURE PAPER 1
2012 QUESTIONS

SECTION A (30 marks)
Answer ALL the questions in this section in the spaces provided.

1 Name the part harvested for each of the following crops:

(a) onions ($^1/_2$ marks)

(b) carrots ($^1/_2$ marks)

(c) coffee ($^1/_2$ marks)

2. State **four** biotic factors that influence crop production. (2 marks)

3. Name **four** methods of controlling crop pests. (2 marks)

4. State **four** ways of harvesting water on the farm. (2 marks)

5. Name **four** farm records that should be kept by a poultry farmer. (2 marks)

6. State **four** disadvantages of using organic manure in crop production. (2 marks)

7. Give **two** ways in which pastures are classified. (1 mark)

8. State **four** disadvantages of organic mulches. (2 marks)

9. Give **five** advantages of practicing crop rotation. (2 $^1/_2$ marks)

10. State **two** advantages of earthing up in crop production. (1 mark)

11 Give **four** harmful effects of weeds on crop production. (2 marks)

12 State **three** advantages of shifting cultivation. (1 $^1/_2$marks)

13 Give **five** advantages of zero grazing in dairy farming. ($2^1/_2$ marks)

14. State **four** factors that determine the stage at which a crop is harvested. (2marks)

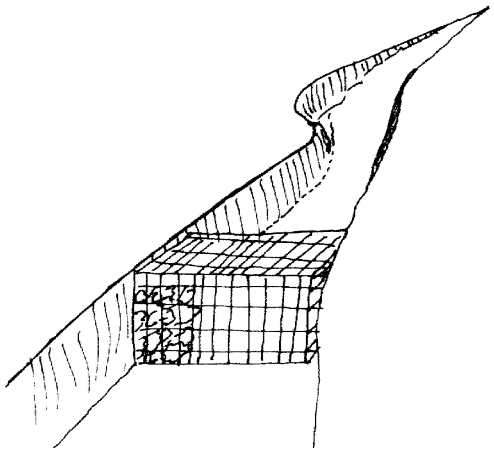
15. State **four** ways in which land reform can be implemented in Kenya. (2marks)

16. Give **four** factors that influence the number of secondary cultivation in seedbed preparation. (2marks)

SECTION B

Answer all the questions in this section in the spaces provided.

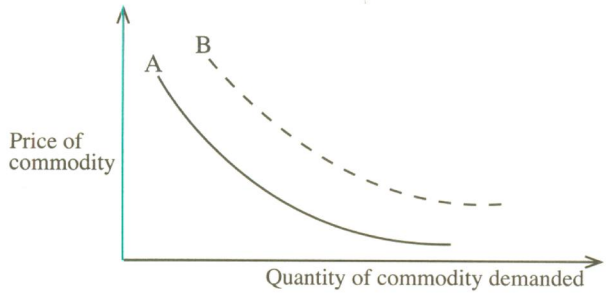
17. The illustration below shows a structure used for controlling soil erosion. Study it carefully and answer the questions that follow;



a) Identify the structure (1mark)

b) Explain two ways in which the structure helps to control soil erosion. (2marks)

18. The diagram below illustrates the law of demand in agricultural marketing. Study it and answer the questions that follow.

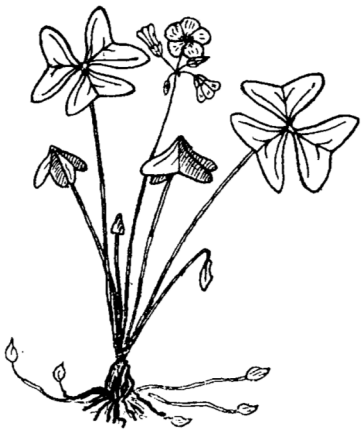


a) Give a reason for the shape of the curve labelled A. (1mark)

b) If the price of the commodity remains constant, explain three factors that can cause the curve to shift from A to B. (3marks)

19. The diagrams below illustrates common weeds in arable land. Study them carefully and answer the questions that follow.

C



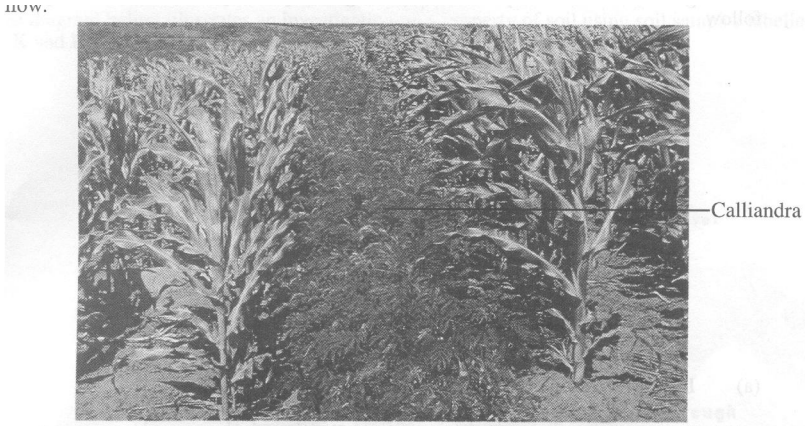
D

a) Identify the weed labelled D. (1mark)

b) Classify the weed labelled C according to plant morphology. (1mark)

c) Give one reason why it is difficult to control the weed labelled D. (1mark)

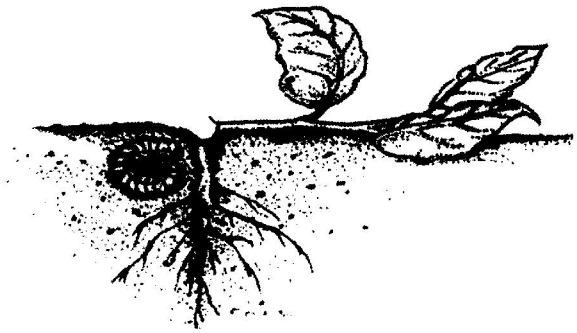
20. The diagram below illustrates an agroforestry practice. Study it and answer the questions that follow.



a) Identify the agroforestry practice illustrated above. (1mark)

b) Explain three benefits of the practice illustrated above. (3marks)

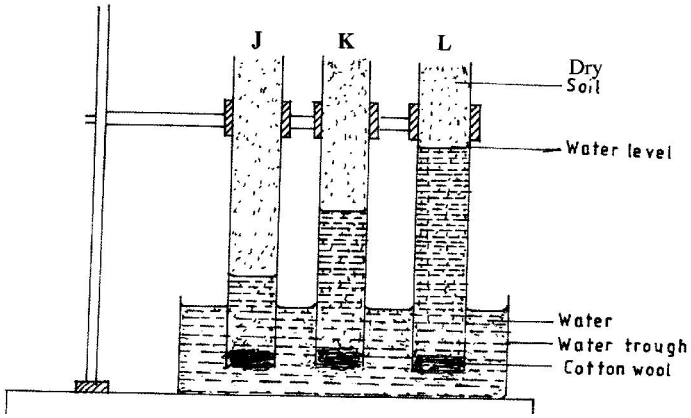
21. The diagram below shows a pest and the damaged crop. Study it and answer the questions that follow;



a) Identify the crop pest illustrated above. (1mark)

b) Explain two ways of controlling the pest (2marks)

22. The diagram below illustrates an investigation on a property of soil using soil samples labelled J,K and L.



a) If the levels of water shown in the diagram were observed after three hours, name the property of soil being investigated. (1mark)

b) What is the relationship between the soil property named in (a) above and the size of soil particles? (1mark)

c) Which soil sample would be suitable for growing paddy rice? (1mark)

SECTION C (40 marks)

Answer any TWO questions from this section in the spaces provided after question 25.

23 (a) Explain **five** factors that should be considered in farm planning. (10 marks)

(b) Describe the transplanting of tomato seedlings. (10 marks)

24 (a) Explain **five** factors that should be considered when siting a vegetable nursery. (5 marks)

(b) Explain six factors that should be considered when selecting seeds for planting. (6 marks)

(c) Explain the different ways in which each of the following environmental factors influence crop production:

(i) temperature; (4 marks)

(ii) wind. (5 marks)

25 (a) Outline the information contained in a Purchase Order. (5 marks)

(b) Describe the harvesting of tea. (6 marks)

(c) Explain the importance of irrigation in crop production. (5 marks)

(d) Describe the role of magnesium in crop production. (4 marks)

AGRICULTURE PAPER 2
2012 QUESTIONS

SECTION A (30 marks)
Answer ALL the questions in this section in the spaces provided.

1. Apart from hides and skins, name the raw material obtained from each of the following livestock for the textile industry:

   (a) goat..... (1/2 mark)

   (b) sheep..... (1/2mark)

   (c) rabbit..... (1/2 mark)

2. Give **three** reasons for candling eggs in poultry production. (1 1/2 marks)

3. Name **two** nutritional diseases of cattle. (1 mark)

4. State **two** advantages of housing calves singly in cattle management. (1 mark)

5. Give **four** features of housing that help to control livestock diseases. (2 marks)

6. Name **three** methods of harvesting fish in a pond. (1 1/2 marks)

7. State **five** methods of dehorning in cattle management. (2 1/2 marks)

8. Give the appropriate term that refers to each of the following:

   (a) castrated chicken (1/2 mark)

   (b) young one of a rabbit (1/2mark)

   (c) mature male goat. (1/2mark)

9 Give **three** ways in which farmers market beef cattle in Kenya. (1 1/2 marks)

10 State **four** causes of egg eating in a flock of layers. (2 marks)

11 Name **two** practices that are carried out when preparing ewes for mating. (1 mark)

12 Give **four** reasons for identification in cattle management. (2 marks)

13 State **three** advantages of fold system in poultry rearing. ($1^1/_2$marks)

14 State **four** practices that immediately come after complete milking in a milking shade. (2 marks)

15 The following is a list of livestock diseases:
- brucellosis
- trypanosomiasis
- newcastle
- anthrax
- african swine fever
- black quarter.

Which **two** diseases are

(a) both bacterial and zoonotic? (1 mark)

(b) caused by virus? (1 mark)

16 State **three** functions of a lubrication system on a tractor. ($1^1/_2$ marks)

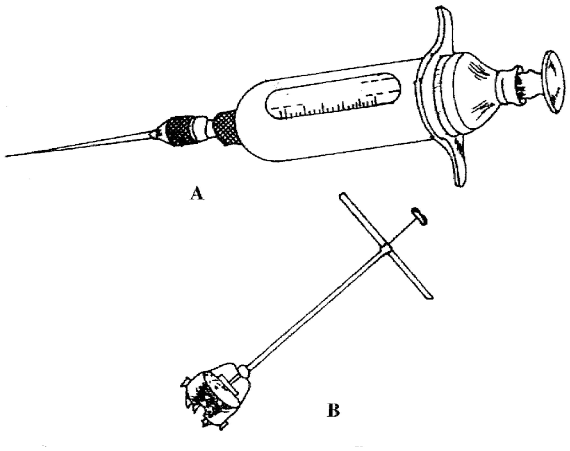
17 Distinguish between the following terms as used in livestock health:

(a) isolation and quarantine; (2 marks)

(b) curative drug and prophylactic drug. (2 marks)

SECTION **B** (20 marks)
Answer ALL the questions in this section in the spaces provided.

18 Below are illustrations of farm tools and equipment.



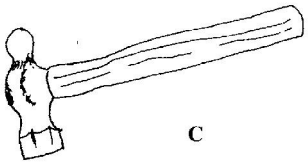
(a) Identify the tool/equipment labelled A and **B.**

A..... (1 mark)

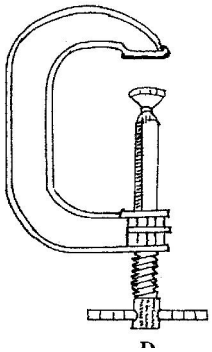
B..... (1 mark)

(b) State **one** appropriate use of the tool labelled C. (1 mark)

(c) Explain **two** maintenance practices for the tool labelled **D.** (2 marks)



C



a) Identify the tool/equipment labelled A and B.

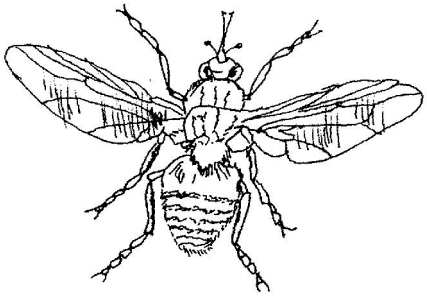
A…… (1mark)

B…….. (1mark)

b) State one appropriate use of the tool labelled C. (1mark)

c) Explain two maintenance practices for the tool labelled D. (2marks)

19. The diagram below illustrates a livestock parasite.

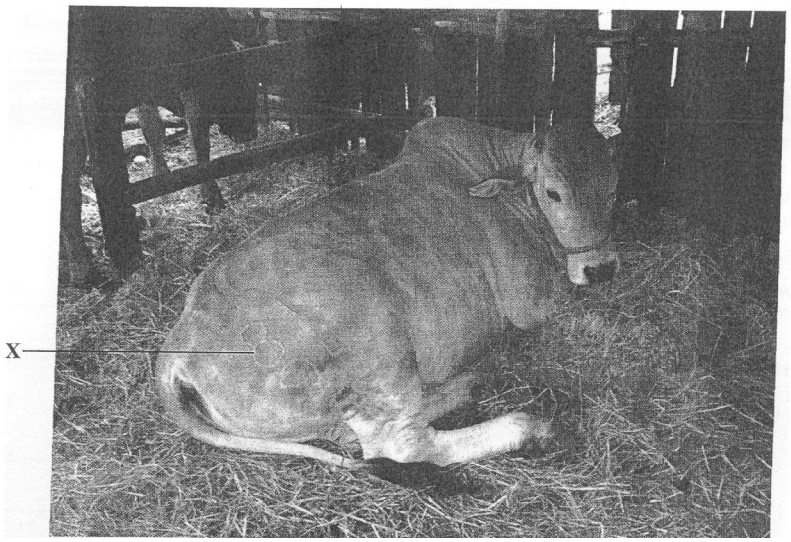


a) Identify the parasite illustrated above. (1mark)

b) State the major harmful effect of the parasite. (1mark)

c) Explain four control measures for the parasite. (4marks)

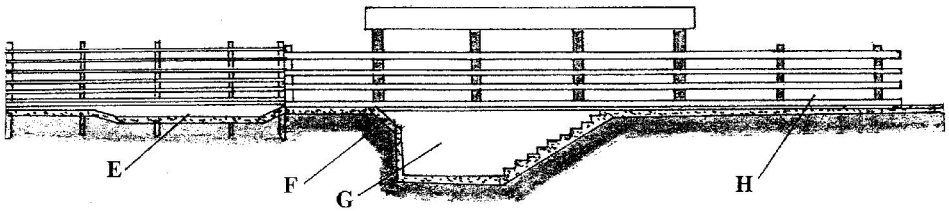
20. The photograph below illustrates a method of identification labelled X in cattle.



a) Name the identification method. (1mark)

b) Explain three disadvantages of the identification method. (3marks)

21. The illustration below shows a cross section of a cattle dip.



a) Name the parts labelled E and G.

E…… (1mark)

G…… (1mark)

b) State one use for each of the parts labelled E, F and G. (3marks)

E…….

F…….

H…….

SECTION C (40 marks)

Answer any TWO questions from this section in the spaces provided after question 24.

22 (a) Describe the functions of the various types of pens in a piggery unit. (4 marks)

(b) Describe the control measures for tapeworms *{Taenia spp)* in livestock. (6 marks)

(c) Giving a relevant example in each case, describe the role of the various components of a balanced diet in livestock nutrition. (10 marks)

23 (a) Describe the management of one day old chicks in a brooder until they are eight weeks old. (12 marks)

(b) Give the reasons why embryo transfer use should be encouraged in dairy cattle breeding. (8 marks)

24(a) Describe foot rot disease under the following sub-headings:

(i) causal organism; (1mark)

(ii) signs of infection; (5marks)

(ii) control measures. (4 marks)

b) Explain the importance of each of the functional differences between a disc plough and a mouldboard plough in land preparation. (10 marks)

AGRICULTURE PAPER 1
MARKING SCHEME 2012

1 Name the part harvested for each of the following crops:

(a) onions - bulb/ leaves

(b) carrots - roots

(c) coffee - berry/ chimes/ fruits ($3x^1/_2 = 1^1/_2$marks)

2. Biotic factors that influence crop production.
- Pests
- Decomposers
- Pathogens
- Nitrogens
- Pollinators
- Weeds
- Predators ($4 \times {}^1/_2 = 2$ marks)

3. Methods of controlling crop pests.
- Chemical
- Biological
- Cultural
- Physical/ mechanical
- Legislation ($4 \times {}^1/_2 = 2$ marks)

4. ways of harvesting water on the farm.
i) Roof catchment
ii) Rock catchment.
iii) Weir/ dam
iv) Retention ditches/ level terraces.
v) Micro – catchment.
vi) Water parts/ ponds ($4 \times {}^1/_2 = 2$ marks)

5. Farm records that should be kept by a poultry farmer.
i) Egg production
ii) Labour records
iii) Feeding records
iv) Health records
v) Marketing records
vi) Inventory records ($4 \times {}^1/_2 = 2$ marks)

6. Disadvantages of using organic manure in crop production
i) Low nutritive value per unit volume/ weight.
ii) Livelihood of spread of disease/pest/weeds.
iii) Bulky are difficult to store/transport/apply.
iv) Looses nutrients if poorly stored
v) Variable in nutrient content.

vi) Difficult to qualify amount of nutrients per unit volume. (4 x $^1/_2$ = 2 marks)

7. Ways in which pastures are classified.
i) Pasture stand; Pure/mixed.
ii) Pasture establishment/ natural artificial
iii) Ecological zone/altitude. (2 x $^1/_2$ = 1mark)

8. Disadvantages of organic mulches.
i) Expensive to transport and apply/bulky
ii) Could be a fire risk.
iii) Provides breeding ground/hiding place for pests
iv) Intercepts light showers of rainfall.
v) Can spread pests/weeds/diseases (4 x $^1/_2$ = 2 marks)

9. Advantages of practicing crop rotation.
i) Ensures maximum utilization of nutrients.
ii) Controls build –up of pests/diseases/controls pests/diseases
iii) Controls weeds that are specific to particular crops/ controls weeds.
iv) Improves soil fertility when leguminous crops are included.
v) Controls soil erosion when cover crops are included
vi) Improves soil structure if grass lay included (5 x ½ = $2^1/_2$ marks)

10. Advantages of earthing up in crop production.
i) improves tuber formation/ tuber expansion/ root formation
ii) Improves drainage around the crop
iii) Conserves water/soil
iv) Facilitates harvesting of tuber crops
v) Root protection (2x $^1/_2$ = 1 mark)

11 Harmful effects of weeds on crop production.
- Lower crop yields
- Lower quality of crop products
- Some harbor crop pests/diseases
- Increase the cost of production
- Suppress growth of crops through competition for light, space.
- Some are parasitic to crops
- Some block irrigation channels (4 x $^1/_2$ = 2 marks)

12 Advantages of shifting cultivation.
- No pest and disease build-up
- Low capital requirement
- No land disputes as land ownership is not individualized.
- Soil structure is maintained
- Give time for land fore gain fertility. (3 x $^1/_2$ = 1 $^1/_2$marks)

13 Advantages of zero grazing in dairy farming.
- Quick accumulation of manure
- Animal produce high yield due to less wastage of energy.
- Its easy to control diseases/parasites.
- Requires little land
- Allows higher stocking rate.

- Animal use feeds without wastage. (5 x $^1/_2$ = 2$^1/_2$ marks)

14. Factors that determine the stage at which a crop is harvested.
- Market price
- Weather conditions
- Market demand
- Purpose /intended use.
- Concentration of required chemicals (4 x $^1/_2$ = 2 marks)

15. Ways in which land reform can be implemented in Kenya.
- Land consolidation
- Land adjudication and registration
- Land settlement and resettlement
- Tenancy reform
- Redistribution of land.
- Improved land legisltation
- Sub – division (4 x $^1/_2$ = 2 marks)

16. Factors that influence the number of secondary cultivation in seedbed preparation.
- Type of crop to be established/size of seed
- Moisture content of soil
- Type of soil
- Conditions of land after primary cultivation/ implements used for primary cultivation
- Amount of organic matter on the surface.
- Vulnerability of soil erosion/ slope of land/topography. (4 x $^1/_2$ = 2 marks)

SECTION B

17.a) Identify the structure
- Gabion/porous dam (1mark)

b) Ways in which the structure helps to control soil erosion.
- Slows down the spread of water thus reducing its erosive power.
- It traps the detached soil particles. (2 x 1 = 2 marks)
-

18.a) Give a reason for the shape of the curve labelled A.
As the price of the commodity increases the quantity demanded decreases and vice versa. (1x1=1mark)

b) If the price of the commodity remains constant, explain three factors that can cause the curve to shift from A to B.
- If there is an increase in the income of consumers.
- Effective advertisement/sales promotion
- Increase in the price of a related/substitute
- If there is an increase in population
- Taste and preference
- If the quality of the commodity goes up (3 x 1 = 3marks)

19. a) Identify the weed labelled D.
- *Oxalis spp./ oxalis latifolia*/oxalis (1mark)

b) Classify the weed labelled C according to plant morphology.
- Broad – leaved weed. (1mark)

c) Reason why it is difficult to control the weed labelled D. (1mark)
Presence of underground bulbs.

20. a) Identify the agroforestry practice illustrated above. (1mark)
- Alley cropping/hedge row/ hedger row intercropping.

b) Benefits of the practice illustrated above. (3 x 1= 3marks)
- source of folder when tree foliage is cut and fed to livestock.
- Improves soil fertility through nitrogen fixation/nutrients re-cycling
- Facilitates soil and water conservation when roots bind soil particles/ improves soil structure
- Source of mulch/ material/ compost material.

21.a) Identify the crop pest illustrated above. (1mark)
- Cutworm/ *agrotis spp.*

b) Ways of controlling the pest
- Early planting for crop to establish early and outgrow the pest.
- Application of appropriate pesticide/ insecticide/ chemical to kill it
- Field hygiene to prevent transmission from previous crop residues.
- Physical killing and destruction (2marks)

22. a) Name the property of soil being investigated. (1mark)
- Soil capillarity

b) What is the relationship between the soil property named in (a) above and the size of soil particles? (1mark)
- The smaller the size of the particles the greater the force of capillary.

c) Which soil sample would be suitable for growing paddy rice? (1mark)
- soil labelled L.

SECTION C (40 marks)

Answer any TWO questions from this section in the spaces provided after question 25.

23 (a) factors that should be considered in farm planning.
- Environmental factors/climate/soil types because these will determine the specific enterprises that are possible in an area.
- Size of the farm as this will determine the size/number of enterprises that are possible.
- Farmer's objectives and preferences; so that the farmer will have a sense of ownership of the farm for motivation.
- Government regulations or policy to ensure that laws are not flouted.
- Availability and cost of farm input to select on an enterprise that is affordable
- Security of enterprises so as to ensure safety.
- Trends in the labour market/skills and the cost of labour to ensure availability throughout.
- Existing market conditions and price trend so that whatever is produced is sold and at appropriate prices.
- Communication and transport to ensure that produce reach markets and inputs are easily accessed.
- Possible production enterprises so as to choose the most profitable and convenient.

(5x1=10 marks)

(b) Transplanting of tomato seedlings.

- Should be done when seedlings are pencil size thick/ one month old
- Nursery should be watered before to ease lifting of seedlings
- Use garden trowel to ensure that seedlings are lifted with lump of soil around roots
- Apply appropriate pesticide or the planting holes and thoroughly mix these with the soil.
- Lift only healthy and vigorous seedlings from the nursery
- Plant one seedling per hole at the same depth as was in the nursery
- Transplanting is preferably done in the evening or on a cloudy day
- Provide temporary shade to the transplanted seedlings.
- Water the seedlings as necessary.
- Place the soil around the seedlings and firm
- Holes dug are spaced at 60 – 100cm by 50 – 60cm
- Transplant onset of the rains/ when the soil has enough moisture (water transplanting holes)
- Transport the seedlings carefully/use a wheelbarrow
- Planting holes should be dug at 15cm deep. (10x1=10 marks)

24 (a) Factors that should be considered when siting a vegetable nursery. (5 marks)

- Near a water source for easy watering
- In a well sheltered place to prevent strong winds which can uproot seedlings and cause excessive evaporation
- Security so as to protect them from theft and destruction by animals/ birds
- On a gentle slope to prevent erosion through run-off and to prevent flooding
- Type of soil, should be well drained and fertile
- Previous cropping/avoid an area where same crop family had been planted to avoid pest and diseases attack/build up
- Near the seedbed/main field to minimize damage to seedlings during transplanting
- Accessibility for ease of movement
- Away from shading effect to allow sunshine (5x1=5marks)

(b) Factors that should be considered when selecting seeds for planting.

- Adaptability – should be adapted to local ecological condition
- Physical deformities/damages – should be free from physical deformities/damages
- Health – should be free from pests/diseases
- Viability /germination percentage-should have high viability/germination percentage
- Parent plant – should be from high yielding/healthy parents/ high quality/early maturing
- Purity – should be clean/free from impurities
- Maturity – should be of correct maturity stage
- Age – storage period – seeds stored for long periods have low viability/germination percentage hence should not be selected
- Size of seeds – seeds should be of correct size

(6x1=6marks)

(c) Environmental factors influence crop production:

(i) temperature; (4 marks)

- Affect quality of certain crops eg pineapples, pyrethrum.
- Influence the rate of physiological processes in a crop, hence faster growth rate
- Cause increase in incidences of diseases.
- Low temperatures cause frost injury
- High temperatures increase rate of evatranspiration hence wilting
- Influence distribution of crops

(ii) wind. (5 marks)

- Strong winds increase the rate of evaporation/evapotranspiration/wilting
- Influences amount of rainfall in the given area
- Help in pollination of crops

- Strong winds have a cooling effect which influences rate of physiological processes.
- Strong winds may cause soil erosion
- Strong winds may cause lodging/destruction of certain crop structures
- Winds can spread diseases/pests/weeds.
- Winds help in seed dispersal
- Winds is fed in crop cleaning/winnowing of grains
-

25 (a) Purchase Order. (5 marks)

- Quantities of goods
- Type of goods required
- Date of order
- Date within which the ordered goods should be delivered
- Person who orders the goods
- Person who authorized the order
- Purchase order serial number
- Total cost amount/cost involved
- Cost of the good cost of each good

(b) Harvesting of tea. (6 marks)

- Leaves are picked selectively for the highest quality
- Pluck top two leaves and the bud
- Use a plucking stick to maintain the plucking table
- Pluck at 5 – 7 days intervals in rains and 10 – 14day in dry periods/ cold period.
- Put plucked tea in woven baskets to facilitate air circulation/prevent fermentation
- Do not compress the leaves in this baskets to prevent heating up/browning.
- Put plucked tea in cool and shaded place
- Deliver to the factory on the same day

(c) Importance of irrigation in crop production. (5 marks)

- Irrigation increases crop yields and ensure a steady supply of food throughout the year
- Maximizes the utilization of resources eg in places where the soil is fertile but the water / rain is inadequate
- Important for the reclamation of arid and semi-arid land.
- Provides a regular reliable and adequate supply of water in areas with little rainfall.
- Source of employment in areas where it is used extensively.
- Promotes crop production for the export market and therefore contributes to a country's revenue
- Allows production of paddy rice
- Allows growing of crops n green houses
- Facilitates irrigation in crop production
- Controls pests

(d) Role of magnesium in crop production. (4 marks)

- Important in chlorophyll formation
- Promotes the formation of fats and oils in crops eg soya beans, sunflower, ground nuts.
- Aids in the absorption and translocation of phosphorous
- Enhances the nitrogen fixing power of the legumes
- Activates the synthesis and translocation of carbohydrates and proteins in plants.
- Activates enzymes in crops