PART THREE

ANSWERS TO SAMPLE PAPERS

25

Answers to Theory Questions

Sample Paper 1

SECTION A (30 marks)

1. It is an art because skills are learned and activities performed manually e.g. tilling of the land, etc.
2. Agriculture provides employment in three ways:
   (i) Primary employment -working on farms.
   (ii) Secondary employment - in agriculture-based industries.
   (iii) Tertiary employment - in distribution of farm produce.
3. (a) Subsistence farming involves the production of farm produce specifically for home consumption with little or nothing for sale.
   (b) Monoculture is the practice of growing one type of crop on the same piece of land year after year.
4. (a) Herbicide
   (b) Acaricide
   (c) Fungicide
5. (i) Difficult to mechanise the farm operations.
   (ii) Competition between the crops for the growth factors.
   (iii) Damage of one of the crops if the other is ready earlier especially during harvesting.
   (iv) There could be many different types of pests and diseases hence expensive to control them.
6. Temperature at which growth of plants is best.
7. Process during which green plants manufacture their food in presence of sunlight.
8. Hand-tools which are mainly used during initial seedbed preparation operations are:
   (i) axe (ii) jembe (iii) fork-jembe (iv) panga,
   (v) rake (vi) spade (vii) pickaxe (viii) wheelbarrow.
9. (a) (i) Crosscut saw for cutting the ends.
   (ii) A spokeshave for smoothing the sides.
   (b) A bolus gun.
10. (a) **Ball pein hammer:**
   (i) Fixing rivets (rivetting).
   (ii) Used on cold chisels to shape or cut metals.
   (iii) Straightening wires, nails and iron-sheet surfaces.
   (iv) Driving in nails.
   (b) **Marking gauge**: To indicate or mark the exact point where to cut or smoothen on wood surfaces.
   (c) **Lactometer**: To check the specific gravity of milk, i.e. detect the amount of water in a given sample of milk.

11. Precautions taken when working with farm tools.
    (i) Use every tool for its designed purpose to avoid possible accidents.
    (ii) Ensure that the sharp ends of tools point away from user or any other persons in proximity.
    (iii) Use protective or safety devices to avoid potential accidents to users.
    (iv) Replace and/or repair broken handles of tools. They should also be smooth surfaced and firmly fixed.
    (e) Handle delicate tools carefully or safely to minimise breakages.
12. (a) (i) Apply oil to moving parts.
    (ii) Apply grease/lubricate moving parts.
    (b) (i) Control weeds.
    (ii) Top-dress with N-fertilisers occasionally.
    (iii) Practise controlled grazing to avoid denudation
    (iv) Cut back dry and unpalatable stems with tractor mover to encourage fresh regrowth after grazing cycle.

SECTION B (30 marks)

13. (i) Because arable land is becoming smaller.
    (ii) Ranching will lead to higher production of livestock to meet the high demand for meat.
    (iii) Most parts of Kenya are arid.
14. Advantage of mixed farming:
    (i) The farmer will obtain sustained income throughout the year.
    (ii) The farmer will never experience total loss.
    (iii) Animals contribute manures to crops while crops provide crop residues to be fed to livestock.
    (iv) The labour is utilised efficiently throughout the year.
    (v) The soil loses its fertility very quickly.
    (vi) Animals can be used to do work in the farm e.g. oxen for digging the land.
15. Range management is the improvement of natrual forage for purpose of feeding livestock.
16. (a) (i) They move in search of better pastures.
    (ii) They move in search of water for their livestock.
    (b) Problems of shifting cultivation:
    (i) It is a wasteful method of farming.
    (ii) Slow rate of regeneration of vegetation allowing soil erosion to take place.
    (iii) No incentive to develop the land.
    (iv) No permanent structures are put up hence a lot of time is wasted in travelling or moving the homestead.
    (v) A lot of time is wasted in moving from one piece of land to the other.
17. (a) (i) High temperature destroy pasture while low temperatures inhibit growth of pasture
    (ii) High temperature affect the metabolism of animals hence hindering livestock performance
    (b) Characteristics of a high potential area.
    (i) Fertile soils.

(ii) High and reliable rainfall.
(iii) Moderate slope.
(iv) Cool weather.

18. (a) (i) Rill erosion is the washing away of soil by water in small channels while Gully erosion is the washing away of soil by water in deep and wide channels.
(ii) Rill erosion is less severe than gully erosion.
(b) (i) Plant nutrients and soil micro-organisms are carried away hence low crop yields.
(ii) Siltation of dams and rivers, etc.
(iii) Pollution of the water.
(iv) Land slides.

19. (a) To improve quality of the plant e.g high yield, early maturity, disease, pest and drought resistance.
(b) Develop cultivars or varieties suitable to certain areas.
(c) To improve nutritive value.

20. (i) Farm tools make work easier i.e. increase working efficiency.
(ii) Help to avoid drudgery.
(iii) Timeliness of operations is achieved.
(iv) Operations e.g. spraying to control pests and diseases are more exact and hence effective.

21. (a) Wheat: (i) Dusty brown beetle.
(ii) Shiny cereal weevil.
(iii) Black wheat beetle.
(iv) Barley fly.
(v) Aphids.
(vi) Birds e.g. Sudan dioch.
(b) Pawpaw: (i) Mites.
(ii) Birds.
(c) Mango: (i) Mango weevil.
(ii) Scale insects.
(d) Coconut
(i) Coconut rhinocerus beetle.
(ii) Coreid bug.

22.

Pest	*Crop attacked*	*Cultural Control*
Antestia	Coffee breeding	Open pruning to discourage them from breeding
Stainer Bugs	Cotton	Use of trap-crops to divert the pest
Stalk borer	Maize	(i) Early planting Borer
		(ii) Destroying affected crop residue
Rhinoceros	Coconut	(i) Destroy crop beetle residues
beetle		(ii) Kill adult beetles in the palm buds

SECTION C (40 marks)

23. (a) A pasture is defined as a cover of grass or grass and legumes used for feeding livestock.

(b) Establishment:
(i) Land preparation should be done early enough to facilitate timely planting.
(ii) Dig thoroughly to eliminate perennial weeds e.g couch grass and other plant roots.
(iii) Harrow the soil to a fairly fine tilth since most grass and legume seeds are small.
(iv) Obtain certified seeds from approved agencies e.g. K.G.G.C.U. or Kenya Seed Company.
(v) Inoculate legume seeds with appropriate strain of nitrogen-fixing bacteria.
(vi) Plant early in the main rains at seed rate of 1.5-2.0 kg per hectare of pure germinating seeds by drilling.
(vii) Apply about 200 kg of D.A.P/hectare at planting for quick establishment.
Maintenance:
(viii) Practise controlled grazing.
(ix) Top-dress pastures using nitrogenous fertilisers.
(x) Control weeds to reduce competition for nutrients.
(xi) Cut back hard or callous and unpalatable material with a mower to encourage quick regrowth after grazing sessions.

24. (a) **Ecological requirements**:
(i) Rainfall: 650-750 mm per annum, well-distributed.
(ii) Temperature: (16°C-35°C).
(iii) Altitude: 1500 m and below.
(iv) Light: Avoid intercropping to ensure maximum light supply.
(v) Soils: Light to medium clay loams.
Fertile, well-drained and with a pH of 6.0-8.0

(b) **Planting**:
(i) Plant early in the main rains at spacing of 30 cm x 90 cm (one seed per hole) or 45 cm x 90 cm (two seeds per hole) and to a depth of 2.5 cm.
(ii) Plant 20 seeds per hole then thin to 5 then to 2 or 1 seedlings.
(iii) Apply D.A.P. fertiliser at planting at the rate of 200 kg. per hectare.

(c) **Disease control**:
Two diseases are of economic importance in cotton:
(i) **Bacterial blights**:
- Attacks seedlings and bolls causing black lesions on branches which are eventually shed.
- Controlled by closed season, seed-dressing with copper dust and growing resistant varieties.

(ii) **Fusarium wilt**:
- Caused by a fungus which attacks leaves, causing browning and later shedding of leaves.
- Controlled by planting resistant varieties, crop rotation and field hygiene.

(d) **Marketing**: Cotton farmers sell their produce to Cotton Lint and Seed Marketing Board, which in turn sells it to textile and other industries.

25. (i) Collect information/data on farm activities.
(ii) Analysis of the knowledge or information acquired.
(iii) Make prediction of the likely outcome of possible alternative courses of action.
(iv) Decide on the appropriate course of action to be taken.

(v) Formulation of farm plan on the basis of the predictions.
(vi) Bearing consequences of the plan.
(vii) Guide the implementation of the plan.
(viii) Supervise the implementation of the plan.
(ix) Keeping of farm records/accounts.
(x) Carry out routine activities at appropriate times.
(xi) Proper conservation of resources.

Sample Paper 2

SECTION A (30 marks)

1. (i) Animal waste is distributed evenly in the paddocks.
(ii) Pasture is given time to regain before it is grazed on again.
(iii) Excess pasture can be harvested for conservation.
(iv) It is possible to reseed empty spaces.
(v) It is possible to top-dress and cultivate to control weeds when pasture is not in use.
2. (i) Dullness.
(ii) Aggressive when approached.
(iii) Abnormal defaecation e.g. diarrhoea.
(iv) Abnormal urination e.g. blood stained urine.
(v) Rough hair-coat or hair falls out.
(vi) Dry mucous membranes.
(vii) Abnormally lower or high temperature.
(viii) Abnormal pulse rate.
(ix) Abnormal respiration rate.
(x) Decline in production.
3.

Ruminants	*Non-Ruminants*
(i) Have four stomach compartments.	(i) Have single stomach compartment.
(ii) Chew the cud	(ii) Do not chew the cud.
(iii) Absence of ptyalin in the saliva.	(iii) Presence of ptyalin in saliva.
(iv) Can handle large quantities of cellulose	(iv) Can handle less quantities of cellulose.

4. Is a structure where animals are immersed in a solution of acaricide and water to control external parasites like ticks.
5. (i) Barbed wire fence
(ii) Plain wire fence
(iii) Electric fence
(iv) Mesh wire fence
(v) Concrete fence
(vi) Wooden fence
(vii) Live fence
(viii) Chain link fence
6. A vaccine is a weakened or killed disease-causing germ given to an animal to stimulate the manufacture of antibodies to counteract infection of a specific disease.
7. (a) It is a disease which can cause high economic losses hence should be reported to authorities. If not reported one is liable to prosecution.
(b) East Coast Fever, Rinderpest, Foot and Mouth, Heartwater, Swine fever, Anthrax, Rabies, Newcastle, Lumpy Skin and contagious Bovine pleura-pneumonia.
8. (a) A forage crop is a plant which either grows naturally or is cultivated by farmers and used for feeding livestock.

(b) (i) Grass forage or grasses.
(ii) Legume forage or legumes.
(c) To introduce or implant a bacteria strain (rhizobia) which fixes nitrogen (converts atmospheric nitrogen into nitrates) in the root nodules of leguminous plants.

9. (a) **A rake**
(i) Breaking up of large soil clods in refining a seedbed before planting seeds.
(ii) Removing the small stones and roots of the previous plants from seedbed.
(iii) Levelling the seedbed before sowing seeds in nurseries.
(iv) Collection and disposal of trash e.g. straw and other rubbish from seedbed.
(b) **Manure fork:**
Used for collecting manure and removing silage from silo or hay
(c) **Strip cup**
It helps a farmer to check or detect the presence of mastitis among milking animals. It reveals abnormalities in milk e.g. blood spots or stains, flakes or clots, watery consistency, etc.
(d) **Planting line**
It's useful in establishing straight lines or rows and hence proper spacing in row-planting of crops. It can also be used for measuring short distance (if marked) when working on nursery seedbeds.

10. Wheat bran, which is used for feeding livestock.
11. Control measures against bud disease of pyrethrum:
(i) Spraying with fungicides e.g Zineb or Maneb.
(ii) Use of resistant varieties as a planting material.
(iii) Cutting back the old stems after every harvesting session.
(iv) Destruction of affected plants and/or plant residues to reduce the chances of spreading.
12. (i) Yellowing of leaves.
(ii) Stunted growth.
(iii) Death of the stem.

SECTION B (30 marks)

13. (i) Softening of the food.
(ii) Storage of food.
14. (a) Immunity is the ability of an animal to resist the infection of a disease.
(b) (i) Natural immunity.
(ii) Artificial immunity.
15. (a) (i) Hay making.
(ii) Silage making.
(iii) Standing forage.
(b) (i) Rumen - stores and softens food.
- microbial action of food takes place here.
(ii) Reticulum - separates the coarse food from the fine food particles.
(iii) Omasum - grinds the food and reduces water.
(iv) Abomasum - enzymatic action takes place.
16. (i) Sow and weaner meal.
(ii) Milk and milk products/meatmeal.
17. (i) Hand spraying or hand dressing to control ticks.

(ii) Drenching or deworming against internal parasites.
(iii) Artificial insemination.
(iv) Applying identification marks.
(v) Taking the temperature.
(vi) Pregnancy diagnosis tests.
(vii) Milking.
(viii) Castration.

18. (a) Pig.
(b) Is a tick which requires three different hosts to complete its life cycle.

19. (a) A fodder crop is a forage plant that is grown, harvested and given to livestock when ready.
(b) Example of fodder crops commonly grown by farmers:
(i) Maize (ii) Sorghum (iii) Kales
(iv) Oats. (v) Rape (vi) Sunflower
(vii) Field and velvet beans. (viii) Vetch
(ix) Edible cana (x) Mangolds.
(xi) Napier grass (xii) Guatemala grass.

20. (i) Direct and controlled grazing e.g. through rotational or strip grazing.
(ii) Stall feeding or soiling.
(iii) Conservation of forage in form of hay or silage to be used during time of herbage shortage.

21. It is the removal of marketable size fish from the pond to provide more food for those left behind.

22. (a) Changing of something in form, space, time or performance of a service.
(b) (i) Land (ii) Labour
(iii) Capital (iv) Management

SECTION C (40 marks)

23. (i) Spray the entire backline from shoulders to tail head.
(ii) Spray the sides in a zigzag motion to trap and retain wash from the backline.
(iii) Spray the belly with the nozzle facing upwards.
(iv) Spray the scrotum/udder and the hind flanks carefully.
(v) Spray both hind legs upto and including the heels.
(vi) Spray under the tail head and the area around the anus and vulva.
(vii) Hold the tail switch onto the rump and spray it thoroughly to ensure complete wetting.
(viii) Spray the neck and the forelegs from the flanks to the heels.
(ix) Spray the head, making sure that the bases of the horns are thoroughly wetted.
(x) Spray the inside of the ears and apply py-grease, particularly if they are hairy.

24. **Propagation:**
Oranges are propagated vegetatively using buddlings obtained from parent plants with exceptionally good qualities e.g. high-yielding, early maturing, tolerance to adverse conditions, etc. They can also be propagated by use of seeds.
Preparation of planting materials:
(i) The selected buddlings are raised in the nursery with light to medium textured, fertile and well-drained soils. The site should have a permanent source of water for irrigation if need arises.

(ii) The spacing of buddling in the nursery is 90 cm. by 30 cm. to allow close attention to individual young plants.

Planting in the field:

(i) Buddings remain in the nursery and are ready for transplanting after 2-3 years. This is done at the onset of the main rains.
(ii) Select the vigorously growing young plants and discard the weak or diseased ones.
(iii) Spacing in the field varies from 6 m. by 6 m. to 9 m. by 9 m. depending on variety, habit of growth and soil moisture.
(iv) Planting holes should be 60 cm. deep and 60 cm. in diameter.
(v) Provide shade or mulch to individual plants and water regularly according to weather conditions.
(vi) Apply about two *debes* of well decomposed manure and 250 gms of D.S.P. per planting hole at planting time. Top-dressing with nitrogen fertilisers is done later at 1200 gms. per tree of C.A.N.

Weed control:

Weeds are controlled by inter-row cultivation, slashing, mulching and spot application of herbicides.

Pruning:

Is done to remove broken, diseased or dead branches. It discourages breeding places for pests and disease agents.

Pest control:

The common pests attacking oranges inlcude false codling moth, mites, aphids and scale insects. These pests mostly attack the fruits and have little effect on the trees.
Control measures include:
(i) Field hygiene and proper disposal of affected fruits.
(ii) A wide range of insecticides, depending on individual cases.

Disease control:

The only disease of economic importance in oranges is Tristeza. It is a virus disease which attacks the whole plant causing stunting and may even kill the tree.
Control measures include:
(i) Use of resistant varieties.
(ii) Controlling aphids which spread the virus.
(iii) Use of clean planting materials.

Harvesting:

This involves picking of ripe fruits as indicated by colour change. Oranges are ready for harvesting 3-4 years after planting in the field. It is important to pack the harvested fruits in wooden crates of light transparent packs to avoid bruising.

Marketing:

Oranges are sold and consumed in the local markets as fresh fruits. Some commercial producers export their produce either as fresh fruits or processed (canned or tinned) orange juices.

25. (a) Dead furrows are two open and opposite furrows while back furrow is putting slices on top of the previous slice to form a ridge.
(b) (i) Depth - use of land wheel or hydraulics.
(ii) Pitch - altering the length of the top link.
(c) (i) Cutting unit or header.
(ii) Feeding unit.
(iii) Threshing unit.

(iv) Separating unit.
(v) Cleaning unit.
(vi) Grain handling unit.

(d) (i) Pick up reel.
(ii) Height of cut.
(iii) Feeding canvases

Sample Paper 3

SECTION A (30 marks)

1. (a) (i) To distribute available forage for livestock throughout the year.
(ii) To provide feed for dry season.
(iii) To ensure better and full utilisation of available land.
(iv) Conserved forage can be sold for money.
(b) Mixed pastures are pastures made up of grasses and legumes.
2. (a) (i) Increases pasture yields.
(ii) Improves quality of forage.
(iii) Economises on the use of fertilisers.
(iv) Ensures rich legume green manure.
(b) (i) Exposing inoculated seeds to direct sunlight.
(ii) Expired bacteria.
(iii) Storing inoculated seeds for too long.
(iv) Dry conditions at or after planting the seeds.
(v) Acidic soils.
(vi) Inoculated seeds coming in contact with acidic fertilisers.
3. (i) Weight of the animal.
(ii) Age of the animal.
(iii) Level of production.
4. (a) These are conditions within or around an animal which lead to that animal contracting the disease.
(b) (i) Age of the animal
(ii) Colour of the animal
(iii) Change of climate
(iv) Body shape
(v) Size of the herd
(vi) Environment
(vii) Health conditions
(viii) Sex of the animal
(ix) Heredity
(x) Animal movement
5. Incubation period.
6. Foot rot.
7. (i) Roughages. (ii) Concentrates.
8. (i) Pruning saw (ii) Secateur
9. (a) **Wheat:**
(i) Grains are milled into flour which is consumed by man in a variety of ways.
(ii) Wheat bran (a by-product of wheat milling) is used for feeding livestock.
(b) **Barley:**
(i) Milled grains are used by brewing industries to manufacture bottled beer.
(ii) Manufacture of baby foods is another product of barley-milling.
(iii) By-products of milling are used to feed livestock.

10. (a) (i) Crowns (ii) Slips (iii) Suckers
    (b) (i) Jam is manufactured.
    (ii) Mango juice is extracted and canned for local and export market.
11. (a) (i) Decorticating.
    (ii) Drying of the fibres.
    (iii) Grading.
    (iv) Brushing to remove bits of flesh.
    (v) Baling or bundling.
    (b) Nicotine - which is the ingredient of all tobacco products.
12. (a) Control measures against ratoon stunding disease of sugarcane.
    (i) Hot watertreatment of setts.
    (ii) Planting resistant varieties.
    (iii) Sterilisation of harvesting tools.
    (iv) Dipping of setts in areton or mercurial oxide.
    (b) (i) Use of clean planting materials
    (ii) Control of aphids
    (iii) Use of resistant varieties
    (iv) The infected material should be rougued and burnt.

SECTION B (30 marks)

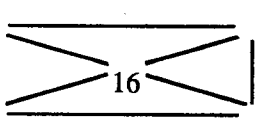
13. 24 m^2
14. (a) Vectors.
    (b) (i) Trench silo.
    (ii) Clamp silo.
    (iii) Bunker silo.
15. (a) (i) Respiration.
    (ii) Oxidation.
    (iii) Leaf breakage and loss.
    (iv) Leaching.
    (v) Fermentation and rotting.
    (b) (i) Baling.
    (ii) Loading.
    (iii) Transport.
    (iv) Storage.
16. Low pH inhibits bacterial growth and preserves the silage.
17. Toggenburg and Saanen.
18. Brucellosis vaginitis, leptospirosis vibriosis and richomoniasis.
19. Factors that determine quantity of silage eaten by a dairy animal;
    (i) Palatability of the material.
    (ii) Physical sizes of ensiled materials.
    (iii) Animal's body weight and size.
    (iv) Level of milk production.
    (v) Physiological state of the cow e.g. pregnancy or sickness.
    (vi) Type of forage plant used.
    (vii) Other feeds which the cow might have eaten before silage is fed.
20. Factors one must consider when sorting cotton fibre into grade A.
    (i) Colour of fibre/stains on fibre.
    (ii) Signs or evidence of damage of any kind.

(iii) Presence of foreign materials e.g. twigs, weeds, dirt of any kind, etc.

21. Control of rust disease in wheat.
    (i) Growing resistant varieties.
    (ii) Early planting.
    (iii) Use of fungicides e.g. zineb and maneb.
22. (i) Feeding to livestock - usually as a supplement or additive to other feeds.
    (ii) Distillation of spirits - used in a variety of commercial ways e.g. gasohol, alcohol and laboratory spirits.

SECTION C (40 marks)

23. Maintenance (servicing) points of farm tools and equipment.
    (i) Store or keep under shed and/or in their respective racks.
    (ii) Clean or wash tools thoroughly after use.
    (iii) Apply used oil or grease on metal surfaces, after cleaning to prevent rusting.
    (iv) Replace or repair broken or worn-out parts to maintain efficiency.
    (v) Sharpen digging or cutting tools regularly.
    (vi) Ensure that handles are smooth and firmly fixed to reduce inconveniences or injuries to users.
    (vii) Lubricate moving parts, before storage, to reduce friction.
    (viii) Handle delicate equipment e.g. thermometer, lactometer, spirit level, etc., carefully and store them separately to avoid damage.
    (ix) Keep milking utensils sterile after cleaning and do not use them for any other purpose(s).
    (x) Supervise closely the use of farm tools if used by unskilled labour.
    (xi) Sterilise syringes before using them to ensure safety of farm animals being treated with the equipment.
24. (a) Pearson's Square Method



Amount of wheat required: $\frac{18}{24} \times \frac{100}{1} = 75$ kg.

Amount of sunflower required: $\frac{6}{24} \times \frac{100}{1} = 25$ kg.

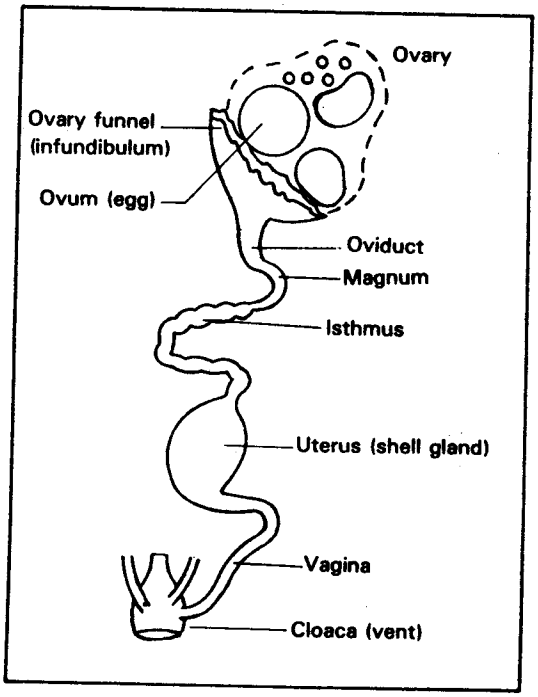
Marks shall be awarded as follows:

(i)	Correct placement of:	
	10% C.P. (wheat)	= 1 mark
	34% C.P. (sunflower)	= 1 mark
	16% C.P.	= 1 mark
	18 parts (wheat)	= 1 mark
	6 parts (sunflower)	= 1 mark
	Total (24) parts	= 1 mark
(ii)	Calculations	= 2 marks
(iii)	Correct amount of wheat (75 kg)	= 1 mark

(iv) Correct amount of sunflower(25kg) = $\frac{1 \text{ mark}}{10 \text{ marks}}$

(b) Factors that determine the feeding value of hay:
(i) Stage of growth at which the forage is harvested.
(ii) Leaf content of the forage materials.
(iii) Degree of damage during handling (curing).
(iv) Physical form of the materials i.e. whether chopped into small or large pieces.
(v) Type of plant used e.g. whether grass or legume.
(vi) Amount of foreign materials included in the hay.
(vii) Additives during feeding time e.g. molasses.

25 **Ovary:** production of ova.
Infundibulum: site of fertilisation and storage of sperm cells. Yolk takes 15 minutes here.
Magnum: Albumen is added. The egg takes 3 hours.
The isthmus: It excretes shell membrane. Water, minerals and vitamins are added. This process takes $1^1/_4$ hours.
The vagina: Pigmentation of the egg takes place. It secretes mucus which reduces friction and facilitates expulsion of the egg. Takes 1 to 10 minutes.
The cloaca: Delivers the egg outside gently.



Sample Paper 4

SECTION A (30 marks)

1. (a) Is the sum of all the digestible organic nutrients e.g. crude protein, crude fibre and nitrogen - free extracts together.
   (b) Is the amount of pure starch which has the same energy as 100kg. of that feed. S.E. of a food and is expressed as:

$$\frac{\text{weight of fat stored per unit weight of food}}{\text{weight of fat stored per unit weight of starch}} \times 100$$

   (c) Is the total amount of protein contained in a feed.
2. (i) Helps to prepare ration that meets nutritional requirements of the animal.
   (ii) It enables the farmer to compare different feedstuffs in order to know their relative values in terms of nutrient content in substituting one feed for another.
3. (i) Chemical composition of the feed.
   (ii) Feed mixtures and other ingredients in the feed.
   (iii) Method of preparation of the feed.
   (iv) Species of the animal.
   (v) Rate of feeding.
4. (i) He is observant and keen.
   (ii) He is knowledgeable and keeps to a regular routine.
   (iii) He notices early signs of sickness, heat, calving or abortion and takes appropriate action.
   (iv) Gentle, kind and human to animals.
   (v) Should keep upto date records.
5. Livestock unit refers to the equivalent of livestock in terms of a mature cow or a steer which is taken as a standard unit.
6. (i) Proteins (ii) Carbohydrates
   (iii) Fibre (iv) Fat
   (v) Minerals (vi) Vitamins
   (vii) Water
7. Leys are pastures of planted grass and legumes.
8.

Crop	Major pest	Control
Cotton	1. Cotton stainer bug	(i) Use of chickens. (ii) Use of trap crops. (iii) Spray with Carbaryl.
	2. American bollworm	Use of Endosulan and Carbaryl.
Coffee	1. Antestia bug	(i) Open pruning. (ii) Spray with Parathion.
	2. Leaf miners	(i) Spraying with Parathion. (ii) Fenitrothion spray.

9. (i) Bagasse.
   (ii) Molasses
10. (i) Animals get enough forage and hence high production.

(ii) Pasture remain productive as long as it is required. Overstocking leads to overgrasing and hence early disappearance of pasture.
(iii) Excess pasture during rainy periods can be harvested and conserved for use during dry seasons.
(iv) Proper stocking rate helps to conserve soil and water resources; since overgrazed pastures are prone to erosion.
(v) Correct stocking rate ensures maximum utility of pasture without wastage; as in the case of understocked pastures.

11. (a) It maintains a low frame which facilitate picking of berries.
(b) Spraying to control pests is easier and more effective.
(c) Change of cycle in single stem is less frequent hence more economical than multiple stem.
(d) Operations e.g. inter-row weeding and spraying using tractor - mounted equipment is easier and more economical with single stem than with multiple stem coffee.

12. (a) Docking in sheep management is the removal (cutting off) of tails of the lambs.
(b) (i) To encourage even distribution of fat in the body.
(ii) To facilitate mating later in adult life.
(iii) To minimise fouling of the wool with faeces.
(iv) To reduce incidences of blowfly infestation or strike.

SECTION B (30 marks)

13. (a) Roughages are feeds of low available nutrients per unit weight and high fibre content whereas concentrates are feeds of high available nutrients per unit weight.
(b) Maintenance ration is the portion of a feed required by an animal to continue with the vital body processes whereas production ration is the feed required by the animals over and above maintenance to enable the animal to produce and grow.

14. (a) Boran, Aberdeen angus, Hereford, Galloway, American Brahman, Charolais and Santa getrudis.
(b) (i) Blocky or square in confirmation.
(ii) Have thick muscles.
(iii) Early maturing.
(iv) Deep chest, girth and short legs.
(v) Have square rumps.
(vi) More resistant to high temperatures.
(vii) Efficient converters of forage into meat.

15. (a) Jersey.
(b) Hampshire down.

16. (i) Docile.
(ii) Conform to the breed type.
(iii) Free from any physical deformities.
(iv) Long, deep body and strong legs.
(v) Fast growing.

17. (i) Sowing of seeds.
(ii) Planting of vegetative materials.

18. (i) Tethering.
(ii) Paddocking.
(iii) Strip grazing.

19. (i) It attacks berries and flowers, making it difficult for them to develop.

(ii) Attacked berries are difficult to pulp and produce poor quality beans.
(iii) It is more difficult and expensive to control.
(iv) It lowers yields much faster than leaf rust does.
(v) It spreads much faster than leaf rust does.

20. Advantages of pruning in coffee management.
(i) To regulate bearing i.e. to prevent overbearing.
(ii) To discourage breeding places for pests and disease agents - especially antestia and coffee berry disease.
(iii) To open up the plant and make spraying more effective.
(iv) To facilitate harvesting of coffee berries.
(v) To improve yields (bean size) through improved air circulation and enough nutrients and moisture.
(vi) To economise on the amount of chemicals used since the trees are less bushy.

21. Hay is a feed produced by dehydrating green forage and conserving it at 16% - 20% moisture content. Silage, on the other hand, is a feed produced by fermentation and conserved in a silo.

22. (a) Merino sheep: wool production.
(b) Corriedale sheep: dual-purpose-mutton and wool production.

SECTION C (40 marks)

23. (a) A weed is any plant growing where it is not required and has more disadvantages than advantages.
(b) (i) They compete with cultivated crops for nutrients, moisture, space and hence lower crop yields.
(ii) They limit the quality and distribution of roots of crop plants.
(iii) They lower the quality of farm produce through contamination. This leads to lowered market value.
(iv) They may harbour pests and diseases of economic importance to crops.
(v) Some weeds e.g. witch weed (striga) are parasitic to cultivated plants.
(vi) Weeds choke crops through shading and causing etiolation. This leads to lower yields.
(vii) They increase costs of production through extra expenses incurred in controlling them or in cleaning the contaminated produce before sale.
(viii) Some weeds e.g. thorn apple and night shade are poisonous when ingested by livestock or humans.
(ix) They lower the quality of pasture forage and hence lower animal productivity.
(x) They interefere with fishing.
(c) (i) They are prolific seed producers.
(ii) Their seeds have long dormancy periods.
(iii) They are fast growers and more aggresive.
(iv) They tolerate a wide range of adverse environmental conditions.
(v) They are heavy feeders.
(vi) Most have effective means of vegetative propagation.
(d) (i) Good crop establishment e.g. through proper spacing, correct and timely fertiliser use and timely planting.
(ii) Use of clean planting materials i.e. free from weed seeds.
(iii) Mulching.
(iv) Crop rotation.

(v) Use of cover-crops to choke or smother weeds.
(vi) Thorough seedbed preparation before planting.
(vii) Controlled grazing.
(viii) Burning the fields e.g. after harvesting to destroy weed-seeds.

24. **Selection of the breeding stock:**
Selection means choosing individuals with desirable qualities, namely;
(i) High fertility and regularity in breeding.
(ii) Good quality wool or mutton.
(iii) Fast growth and early maturity.
(iv) Health - freedom from inherited diseases and tolerance to new infection.
(v) Good mothering ability.
(vi) Freedom from physical deformities e.g. undershot or overshot jaws.

Breeding: This means the mating of selected individual males and females, taking the following into consideration:
(i) **Puberty age**: Sheep are sexually mature at 5 -7 months old.
(ii) **Oestrus period and cycle**: Ewes are on heat for 20-40 hrs. If no conception occurs, heat recurs after 14 - 21 days.
(iii) **Preparation for mating**
- **Crutching and tugging:** This is the removal of wool around the vulva, anus and tails of ewes and the belly and prepuce of rams, respectively. This practice facilitates mating.
- **Raddling:** is the marking of rams on the breast with coloured paste. It is useful in detecting or identifying the serving rams. Every time a ram mounts an ewe a particular mark is left on her back. It is necessary to use a different colour for each ram for ease of identification. The non-serving rams are culled and at the same time the ewes bearing the paste marks are separated.
- **Flushing**: is the practice of providing extra nutritious feeds to ewes 2-4 weeks before mating. This stimulates ovulation and increases the chances of conception.

(iv) **Mating:** Ewes are best mated when they are 12 months old. They are introduced to the rams at least 15 hours after the onset of heat and are left together for long enough to complete mating. The mating ratio is one ram to 30-50 ewes depending on the age, health and nutritional level of the former.

Gestation: Gestation is the period of pregnancy. It is the time between conception and lambing. It lasts for about 150 days (5 months). During this period, the following practices should be carried out:
(i) Vaccination against entero-toxaemia and lamb dysentery.
(ii) Deworming (drenching) 2-3 weeks before lambing is expected.
(iii) Steaming up means extra feeding 1-2 months before lambing. The purpose of steaming up is to:
- ensure rapid growth of the foetus.
- enable the pregnant ewe to build up body reserves in preparation for milk production.
- take care of the maintenance or welfare of the mother before and after lambing.

Lambing: This term means the giving birth to the young ones by sheep.
(i) **Preparation for lambing**:
- Ewes are tugged i.e. wool around the udder, hind flanks and belly are shorn

to enable the young lambs to suck after birth.
- Move the pregnant ewes to a separate lambing pen or paddock for close observation.

(ii) **Signs of approaching lambing:**
- Nervousness and restlessness.
- Front of hips are sunken.
- Tendency to isolate from others and to go off food.

(iii) **Actual lambing:**
Ewes should be closely watched but with as little disturbance as possible. They usually lamb with little or no difficulty but in the event of any problems, assistance becomes necessary.

25. (a) Invoice, Receipts, Delivery notes and local purchase orders.
(b) (i) Transportation (ii) Storage
(iii) Processing (iv) Buying and Selling
(v) Grading and standardisation (vi) Assembling
(vii) Collecting market information (viii) Advertising
(ix) Bearing of risks (x) Financing
(xi) packaging
(c) (i) A perfect market is one where any buyer can purchase from any seller while an imperfect market is where the selling or buying of a given commodity is dominated by a single seller or buyer or where the seller sells different commodities.
(ii) Monopoly refers to a situation where a single seller dominates the market whereas monopsony refers to one where the buyer dominates the market.

Sample Paper 5

SECTION A (30 marks)

1. (a) Methane carbon dioxide.
(b) Excess ammonia is absorbed and excreted as urea.
2. (a) Rumination/chewing the cud.
(b) (i) Minimises chances of bloat.
(ii) Aids peristalsis.
3. (a) Excessive withdrawal of calcium from blood system.
(b) (i) Intravenous infection of calcium borogluconate solution.
(ii) By partial milking or giving food rich in calcium.
4. Lack of magnesium in the diet.
5. (a) Accumulation of gases in the rumen.
(b) Due to buildup of pressure which interfere with circulatory and respiratory system.
(c) Feeding of ruminants with dry roughage during the wet season.
6. Sweet potato vines, young grass, mangols, turnips, passnips, beetroots.
7. (i) High moisture content and low crude fibre content.
(ii) High carbohydrate content.
8. (a) Cereals.

(b) (i) Maize (ii) Wheat (iii) Barley
(iv) Rice (v) Oats

9. (i) Dusting the store with pesticides.
(ii) Thorough cleaning of the store.
(iii) Burning the sweepings.
(iv) Remove and destroy affected plant parts.

10. (a) Tugging: Cutting of wool from around the prepuce in rams before mating.
(b) Gestation: Period of pregnancy, i.e. between conception and lambing.
(c) Weaning: Taking away the lambs from their mothers and feeding them on food other than the mother's milk.

11. (i) Nervousness and restlessness.
(ii) Front of hips are sunken.
(iii) Tendency to isolate from the rest.
(iv) Udder is full or distended.
(v) Vulva is slightly swollen, and there is a colourless mucus discharge from the vulva at advanced stages.

12. (i) Facilitates close supervision and any assistance when necessary.
(ii) To provide shelter if the weather conditions are harsh.
(iii) To protect them from being bullied by others.
(iv) To reduce chances of lamb chilling, disowning (due to straying and mortality.
(v) To prevent straying of the lamb or disowning by the mother.

SECTION B (30 marks)

13. (i) Type of crop.
(ii) Season of the year.
(iii) Storage method.
(iv) Stage of growth of the crop.

14. Because they contain solanine which is poisonous.

15. (a) Meat is heated until fat drains away and the material is ground to obtain the final product.
(b) Heating until it clots before it is dried and grounded.

16. It increases resistance against disease infection.

17. The hormone alters the metabolism so as to increase muscle and bone formation at the expense of fat formation.

18. (i) Palatability (iii) Nutritive value.
(ii) Digestibility (iv) Bulkiness.

19. (i) Yields of forage species in terms of herbage - quantity per unit of land.
(ii) Resistance to pests and diseases.
(iii) Adaptability to the area where it is to be established.
(iv) Ease with which it can be established and eradicated.
(v) Whether pure or mixed stand.
(vi) Growth rate and fast establishment.

20. (i) They are rich in protein and therefore supplement grasses.
(ii) Have high supply of calcium.
(iii) They are a rich source of Vitamin A.
(iv) They increase nitrogen in the soil through nitrogen fixation.
(v) More palatable forage in the mixtures.

21. (i) Should be sited on a well-drained ground.
(ii) Should be freely-ventilated but without draught. Avoid chilly conditions.
(iii) Should be rain-proof or leak-proof.
(iv) Should have adequate floor-space to avoid congestion or overcrowding.
(v) Should be easy to clean.
(vi) Availability and cost of materials.

22. (i) To encourage fast growth and fattening.
(ii) To improve mutton quality.
(iii) To control breeding by avoiding random mating.
(iv) To make them docile.

SECTION C (40 marks)

23. (a) Selection and preparation of planting materials:
(i) Allow the parent-plants (clones) to grow for six months, after main pruning, to provide long enough branches from which to obtain cuttings.
(ii) Obtain good-sized branches from selected mother-plants.
(iii) Discard 2-3 internodes at the tip and at the base.
(iv) Using a sharp knife or scalpel, make slanting top cuts as near to axillary buds as possible, and sloping away from them. Lower cuts must also be sloping. Each cutting should be 2.5 to 4.0 cm. long.
(v) Avoid damage to the leaf-surfaces of the cuttings.
(vi) Keep cuttings wet and shaded between the time of cutting to planting in the nursery.
(vii) Prepare rooting medium with sub-soil with a handful of phosphatic fertiliser, in polythene tubes (sleeves). These tubes measure 25 cm. long and 7.5 cm in diameter.
(viii) Plant each cutting by pushing it into a polythene sleeve, making sure the leaf does not touch the soil.
(ix) Place the sleeve in a suitable nursery site that is well-watered and sheltered.
(x) Cover the whole nursery with a large polythene sheet to minimise evaporation.

(b) Transplanting:
(i) Seedlings are ready for transplanting after 6-10 months in the nursery or when they are 20 cm high.
(ii) A few weeks before transplanting seedlings are "hardened off" by gradually reducing the amount of shade and water.
(iii) Select vigorously growing seedlings and discard the weak ones.
(iv) Prepare planting holes in the field at spacing of 1.2 m x 0.9 m or 1.5 m x 0.75m.
(v) Transplant at the start of main rains and during cool weather. Shade or mulch around individual plants and provide wind-breaks.

24. (a) Stall-feeding of dairy cattle:
(i) It is rearing of animals (livestock) in confinement.
(ii) Food is taken to animals in the stall.
(iii) It is practiced in densely populated areas.
(iv) High production is usually achieved per unit area of land.
(v) Less incidences of parasites and diseases encountered.
(vi) Easy collection of manure.

(vii) Both labour and capital-intensive.
(viii) Easy handling and close attention given to individual animals.

(b) Artificial Insemination (A.I):
(i) It is obtaining of semen from males and depositing in females' reproductive canal by artificial means.
(ii) It is cheap and can be afforded by small scale farmers.
(iii) It helps in controlling breeding diseases.
(iv) It economises on the use of semen i.e. one male serves many females.
(v) It avoids injury to smaller or younger females by heavy males.
(vi) It facilitates use of semen from injured or dead males.
(vii) Semen can be transported and used at distant or remote places from the donor males.

(c) Culling of layers in a flock of poultry.
(i) It is the removal of undesirable birds from the flock.
(ii) Birds to be culled are chronically sick or injured.
(iii) Birds that are too old.
(iv) Poor layers or non-laying birds.
(v) Broody birds.
(vi) Egg-eater or cannibalistic birds.
(vii) Birds with poor growth (stunted).

25. (a) (i) Should be hard working.
(ii) Should be responsible, competent and dynamic.
(iii) Should be flexible in his farm plans.
(iv) Should be knowledgeable in all agricultural activities.

(b) Production function is the physical relationship between input and output e.g. the use of fertilisers, pesticides and concentrate feeds.

(c) Types of production functions:
(i) increasing returns.
(ii) constant returns.
(iii) decreasing or diminishing returns.

(d) Marginal product is the extra output produced for any additional unit of input.

Sample Paper 6

SECTION A (30 marks)

1. (a) Stocking rate refers to the number of animals that can be supported per unit area of land.
(b) Carrying capacity is the ability of forage stand to maintain a certain number of livestock units per unit area.
2. (i) competition for nutrient
(ii) difficult to manage e.g. weeds and pest control
(iii) it is difficult to collect pure seeds.
3. (a) It is the removal of top fibrous material left over after a period of pasture grazing.
(b) To stimulate fresh growth.

4. **Grasses:**
   (i) Kikuyu grass
   (ii) Nandi setaria
   (iii) Molasses grass
   (iv) Giant setaria
   (v) Napier grass

   Legumes:
   (i) Kenya white clover
   (ii) Louisiana white clover
   (iii) Subterranean clover
   (iv) Lucerne
   (v) Desmodium
5. (i) Use the correct grass species that is adaptable to the ecological zone.
   (ii) Control the weeds where necessary.
   (iii) Protect the area by fencing.
   (iv) Do the reseeding just before long rains.
6. (i) The type of crop.
   (ii) The soil nutrient status.
7. A silo is a structure in which forage is fermented and conserved or stored.
8. It must be both air and water tight.
9. (i) Breeding record for ewes and rams.
   (ii) Lamb mortality and causes.
   (iii) Health and cost of treatment.
   (iv) Feeding and growth records.
10. (i) To provide an area accessible to piglets alone where creep feed is provided to them.
    (ii) To enable piglets to escape being laid on by the sow.
11. (i) The operation requires skills
    (ii) Expensive to make because of high labour demand.
    (iii) Lack of enough excess forage for ensiling.
    (iv) Bulky to store and handle.
    (v) If not ensiled properly it can be susceptible to high losses.
    (vi) It must be fed soon after removal.
12. Factors affecting the quality of silage.
    (i) Stage or maturity of the crop when cut
    (ii) Type of plant material used.
    (iii) Moisture content of the crop.
    (iv) Presence of additives.
    (v) Degree of consolidation
    (vi) Size of pieces ensiled.

SECTION B (30 marks)

13. It is the discontinuance of grazing by livestock on a certain area for a specification period of time for the grass to regenerate.
14. (a) Advantages of zero grazing:
    (i) Easy to control livestock diseases.
    (ii) High production per unit area of land.
    (iii) Proper utilisation of the pastures; no wastage in trampling and fouling.
    (iv) Animals do not waste a lot of energy in walking.
    (v) Good method of accumulating and collecting of farm yard manure and dung for biogas.
    (vi) Possible to keep livestock where it would have been difficult e.g. steep slopes.
    (vii) Possible to keep livestock where land is limited.
    (viii) High level of stocking rate is achieved.

(b) (i) High initial capital
(ii) Labour intensive
(iii) Difficult to manage where water supply is unreliable.
(iv) Lack of technical knowhow at the rural areas.

15. Serum is the substance obtained from the blood of animal which has recovered from a disease. It contains antibodies hence it gives passive and temporary immunity.
16. Lack of Energy (sugar).
17. (a) Rickettsia ruminantium.
(b) Symptoms of heartwater in cattle/sheep/goats.
(i) Rise in temperature
(ii) Nervous signs e.g.
- Animal moves in circle.
- Twitching of the eyelids.
- Protrusion of the tongue.
- Places head against hard objects.
- Paddling limbs when animal falls down.
- General excitement and muscular tremors.
- Animal may appear wild and runs aimlessly.

(iii) Diarrhoea.
18. (i) To increase livestock production.
(ii) To protect consumers of livestock products from diseases.
(iii) To minimise losses through death of animals due to diseases.
(iv) To promote fast growth and long productive animal life.
(v) To minimise expenses incurred in treating infected animals.
(vi) To reduce the spread of diseases to other animals previously uninfected.
19. (i) Proper and adequate feeding to avoid nutrient deficiency problems.
(ii) Proper selection and culling based on individual merits and demerits.
(iii) Regularity in breeding (mating) the selected individuals.
(iv) Maintenance of good health through vaccinating and treatment of sick cases.
(v) Proper housing and general sanitation.
20. (i) Age - old ewes are culled as a continuous process of selection.
(ii) Loss of teeth and hence inability to graze (feed) adequately.
(iii) Chronic diseases or physical deformities.
(iv) Disowning of lambs repeatedly; after lambing.
(v) Low milk production and hence inability to suckle lambs.
21. (i) Accessibility to nectar producing plants.
(ii) Shady conditions to protect bees from strong sun.
(iii) Distance from source of disturbance e.g. noises.
(iv) Proximity to source of water.
(v) Safe distance from human living houses or livestock.
(vi) Safe distance from farm animals.
22. Rearing of young chicks by providing warmth, food and water up to eight weeks old.

SECTION C (40 marks)

23. (a) (i) Most parts of Kenya are arid or semi-arid and goats are more adapted to such conditions.
(ii) Goats are browsers - feed mainly on leaves and young twigs of shrubs in such areas.

(iii) Goats can do with little water for longer time than other farm animals.
(iv) Goats can travel long distances over rough terrains in search of browse unlike other farm animals.
(v) Goats are relatively easier to manage than other classes of livestock.
(vi) They are hardier and tolerant to diseases and parasites.

(b) Management practices carried out on goats:
(i) Mate goats when 1-1$^1/_2$years old and in such a way that kidding will coincide with the start of the rains. Repeat the service 12-24 hours later.
(ii) Dry off pregnant goats (nannies) 6 - 8 weeks before they are due to kid.
(iii) Steam up, when sufficiently dried off, at 3 -4 weeks before kidding with 0.5 - 1.0 kg. of concentrates per day in addition to other feeds.
(iv) Put pregnant nannies in the kidding pens one week before kidding for close supervision.
(v) Kids may be bucket-fed or bottle-fed on milk or milk substitutes (for milk-goats) or left to suckle their mothers (meat-goats).
(vi) Examine teats and udders of nursing goats for cracks/sores or mastitis infection.
(vii) At 2 -3 weeks kids are introduced to solid feeds, e.g. good quality hay, fresh green grass etc. At the same time disbudding and castration may be done on kids not required for future breeding.
(viii) At 6-8 weeks kids are weaned and let out to graze on clean pastures to avoid possible worm-infection.
(ix) Feed mature goats on hay provided in racks, green feeds e.g. lush grass, cut forage, etc. Graze in rotation and provide fresh, cool and clean water. Provide concentrates to milking goats in addition to other roughages.
(x) Provide mineral licks, particularly those containing calcium.
(xi) Milk the goats twice a day and at a good distance from billy goats whose stench can taint milk. Also avoid hairs falling into the milk for the same reason. Wash milk utensils thoroughly and disinfect them.
(xii) Housing should consist of communal pens, which should be well drained, adequately ventilated and disinfected.
(xiii) Foot care. Inspect the feet regularly and trim when necessary to reduce incidences of foot rot.
(xiv) Carry out routine drenching against liverfluke and other internal parasites.
(xv) Treat against external parasites e.g. ticks, mites, lice, fleas, etc.
(xvi) Keep proper and accurate records of all the operations carried out.
(xvii) Vaccinate against anthrax, entero-toxaema, foot and mouth and tetanus, soon after weaning and at two yearly intervals.

24. (a) (i) It is the treatment of seeds before storage or before planting.
(ii) Protects the seeds from attack by storage or soil-borne pests and diseases.
(iii) It is commonly done to cereals and legumes.
(iv) Farmers may either buy already dressed seeds or buy the chemicals and then do the dressing themselves.

(b) (i) Also called early planting.
(ii) Early planted crop maximise on available resources; namely nutrients and moisture in the soil hence higher yields.
(iii) Early planted crops avoid natural hazards e.g. pest outbreaks like army worms, maize stalk borer and diseases.

(iv). Timely planted crops establish faster than weeds and hence yield higher in the absence of weed competition.
(v) It is possible to secure higher price for crop produced when crops are planted early because of selling an early crop.

(c) (i) Aims at maximum plant population per given area that gives maximum yields.
(ii) Is determined by:
- Growth habits of plants
- Soil fertility level
- Rainfall/moisture content of the soil
- Purpose of the crop
- Type of machinery used.

(d) (i) It is one of the principal ways of restoring soil productivity.
(ii) It does this by supplying nutrient required by growing plants that may be lacking in the soil.
(iii) Fertiliser application may be done by
- Broadcasting.
- Row application.
- Top-dressing
- Side-dressing
- Foliar spray application.

(iv) Fertiliser application can change soil pH.

25. (a) Foot and Mouth disease:
Cause: Virus (types O, A, C,South African types [SAT_1 SAT_2, SAT_3] and Asian Type I).
Symptoms:
- Sharp rise in temperature
- Blisters which are painful are found around the mouth, hoofs of the feet leading to lameness on the udder and teats of milking cows.
- Loss of appetite due to inflammation of the lips
- Profuse salivation
- Drop in milk production in lactating cows.
- Emaciation

Control:
- Vaccination at 6 monthly interval
- Quarantine if there is any outbreak
- Regulation of movement of stock by issue of movement permits.

.Nursing of affected animals by giving soft feed and antibiotics.

(b) Rinderpest:
Cause: Virus
Symptoms:
- Dullness
- Anorexia
- necrosis of the mucus membranes of the mouth which later develops into ulcers.
- Diarrhoea with blood stains
- Conjuctivities leading to lachrimation.
- Rectal mucus membrane swollen and congested.

Control:
- Destruction of whole carcass.
- Quarantine.
- Vaccination every 3-7 years.

(c) Pneumonia:
Cause: Bacteria or viruses.
Symptoms:
- Watery discharge from the nose
- Breathing is shallow and rapid
- Abnormal sound from the lungs e.g hissing
- If the chest is pressed the animal coughs
- Dullness

Control:
- High standard of hygiene and proper sanitation
- Keep young animals in warm environments.

(d) Trypanosomiasis:
Cause: Protozoan.
Symptoms:
- Dullness and emaciation
- Lymph nodes become swollen
- Lachrimation which leads to blindness
- Diarrhoea
- Swollen abdomen
- Rough coat
- Anaemia
- Abortion in pregnant females

Controls:
- Control of tsetse files through trapping and tsetse killing, spraying and bush control.
- Treatment by use of drugs.
- Confinement of game animals.

Sample Paper 7

SECTION A (30 marks)

1. (a) (i) Colour
   (ii) Leafiness
   (b) (i) Dry matter content
   (ii) Colour
   (iii) Smell
2. (a) Doe
   (b) Hogget
   (c) Wether
   (d) Farrowing

3. (a) leghorns, incornas, silkies, minorcas, legbars and Exchequer.
   (b) Rhode Island Red, the light Sussex, the New Hampshire Red and the Black Australorps.
4. (i) Have well developed hump
   (ii) Have well developed dewlap, umbilical fold, and ears.
   (iii) Have coffin-shaped head which is long from the eyes downwards.
   (iv) Superior adaptability to high ambient temperatures and resistance to intense solar radiation.
   (v) Resistence to tick-borne diseases.
5. (i) Pollination of flowers
   (ii) Produce honey and wax.
6. Eggs, larva, nymph and Adult.
7. (i) Dullness
   (ii) Rise in temperature
   (iii) Swelling of lymph glands below the ear and in front of the shoulders.
   (iv) Laboured breathing
   (v) Loss of condition
   (vi) Profuse salivation
   (vii) Lachrimation
   (viii) The animal separates itself from the rest of the herd.
8. (a) Primary seedbed preparation refers to all operations carried out in opening the land, for crop production. It involves:
      (i) Felling big trees, where there are any.
      (ii) Clearing the bush or previous vegetation and burning or putting aside trash.
      (iii) Initial cultivation of the cleared land.
   (b) (i) Mechanisation improves efficiency of operations.
      (ii) Saves on labour i.e. number of man-days is reduced
      (iii) Uniformity of produce harvested and hence more acceptability to the market.
      (iv) Timeliness of operations.
      (v) Increased farm production due to improved efficiency.
      (vi) Increased farm productivity.
      (vii) Uniformity in operations.
      (viii) Makes work easier i.e. less laborious.
9. (a) Onions: seeds.
   (b) Banana: suckers.
   (c) Pyrethrum: splits.
   (d) Irish potato: stem tubers.
10. (i) Retarded branching in stems and roots.
   (ii) Dormant lateral buds.
   (iii) Small and few tubers in tuberous crops.
   (iv) Purple colouration and premature leaf fall.
   (v) General stunted growth.
   (vi) Dead, black or brownish spots on fruits and leaves.
11. (a) Nitrogen fixation/nitrification.
   (b) (i) Fixation by lightning
      (ii) Fixation by nitrogen-fixing bacteria (Rhizobium).
      (iii) Fixation by nitrifying bacteria (nitrobacter).
12. Used in dehorning.

SECTION B (30 marks)

13. (a) Protozoan
    (b) (i) Rise in temperature.
    (ii) Constipation or hard dung.
    (iii) Anaemia.
    (iv) Low milk production in lactating cows.
14. (i) Use of drugs e.g. coccidiostat
    (ii) Hygienic conditions
15. (i) Keeping in sealed containers which are non metals
    (ii) Store in a rain proofshed.
    (iii) Should not be in contact with floor or walls.
16. (i) Slow in action.
    (ii) Causes rise in temperature.
    (iii) They are secondary invaders i.e. they attack when the animal has been weakened by other causes.
    (iv) Easy to control if noticed very early.
17. In infectious disease the causal agents are spread through various means e.g. breathing, drinking or eating contaminated food while in contagious diseases the causal agents are spread through contact between the source of infection and susceptible animal.
18. (i) Promote growth.
    (ii) Help in clotting of blood.
    (iii) Help in bone formation.
    (iv) Help in muscular activities.
    (v) Prevent diseases in animals.
    (vi) Act as organic catalysts.
19. (i) Nutrient requirement of the different plants in the sequence.
    (ii) The need to include grass leys in the programme.
    (iii) Types of plants in the sequence i.e. legumes and non-legumes.
    (iv) Prevalent pests and diseases in the area.
    (v) Growth habits of the different plant species to be included.
20. To know the pH value of the soil and hence the crops to grow.
21. "Hardening off" means exposing the seedlings to harsh conditions similar to those in the field after transplanting. This is done by reducing the amount of shade and the frequency of watering.
22. (i) Use of cuttings.
    (ii) Layering.
    (iii) Grafting.
    (iv) Budding or bud-grafting.
    (v) Use of storage organs.

SECTION C (40 marks)

23. (a) (i) Avoid collecting samples from 'dead' furrows, ditches.
    (ii) Do not collect samples from swamps.
    (iii) Do not collect samples near manure heaps.
    (vi) Do not collect samples from recently fertilised fields.
    (v) Avoid ant-hills.

(vii) Do not collect soil under big trees.
(viii) Do not collect soil near fence lines or foot paths.
(ix) Do not use containers which are contaminated with fertiliser or other chemical containers.

(b) (i) It improves drainage and water infiltration.
(ii) It improves aeration
(iii) It minimises build-up of carbon dioxide in the soil, which becomes toxic to crops and micro-organisms.
(iv) It facilitates better root penetration.
(v) It creates favourable conditions for activity of micro-organisms.
(vi) It ensures adequate water retention for growing crops.
(vii) It makes tillage easier.

(c) (i) Initial conditions of the field.
(ii) Nearness to permanent source of water for irrigation when need arises.
(iii) Moisture content of soil/Rainfall pattern of the area.
(iv) Machinery or equipment to be used for the job.
(v) Types of planting materials/size of the seeds.
(vi) Cost factors or Economic returns from the project.
(vii) Physical conditions of the soil/soil types.
(viii) Time remaining before planting is due.
(ix) Landscape or topography of the area.

24. (a) (i) Choose a suitable nursery site, considering accessibility and source of water.
(ii) Dig and prepare the chosen site to a desirable tilth.
(iii) Remove roots of previous plants and stones from the site.
(iv) Make raised or sunken nursery beds (depending on soil moisture) measuring one metre wide and any convenient length.
(v) Plant seeds by drilling at a spacing of 15 cm by 3 cm.
(vi) Apply phosphatic fertilisers or manure
(vii) Cover the seeds to a depth of about 1 cm.
(viii) Erect a shade or apply some mulch on the nursery.
(ix) Water the nursery thoroughly.

(b) (i) Remove the mulch (if it was applied) and erect shade (if it wasn't erected) above the nursery.
(ii) Water the nursery at least twice a day; preferably early mornings and late evenings.
(iii) Remove weeds that may come up.
(iv) Thin young seedlings if they are overcrowded.
(v) Control pests and diseases when the symptoms of attack are noticed.
(vi) Harden off the seedlings by removing shade gradually and reducing the frequency of watering.

(c) (i) Water the nursery thoroughly before transplanting.
(ii) Prepare the field seedling bed to a suitable tilth before transplanting is due.
(iii) Transplant seedlings when 6-10 cms high; selecting the healthy and discarding the weak ones.
(iv) Transplant during a cloudy day or during late afternoon.
(v) Plant seedlings in the field to the same depth as they were in the nursery. Space at 60 cm x 60 cm or 60 cm x 90 cm.
(vi) Plant seedlings at 60 cm by 90 cm.

(vii) Lift each seedling from nursery with a ball of soil to avoid damage to the roots.
(viii) Water the field well before it receives the seedlings.
(ix) Apply a handful of farmyard manure mixed with some phosphatic fertiliser in each hole.

25. (a) (i) To establish boundary lines by use of perimeter fencing.
(ii) Keeps off unwanted visitors e.g. thieves and wild animals.
(iii) Provides effective rotational grazing.
(iv) If live fences are used, they serve as windbreaks.
(v) Used in mixed farming to protect crops from animal damage.
(vi) Fences adds beauty to the organisation of the farm.
(vii) Isolating of animals is made easier.
(viii) Control of breeding is effective.

(b) (i) Locate the corners.
(ii) Clear the fencing area.
(iii) Mark places for gates, strainers and passes.
(iv) Make corners, strainers and passes.
(v) Dig holes to specified depths.
(vi) Firm the posts by use of concrete mixture.
(vii) Drill holes on the posts and fix the wires.
(viii) Strain the wire and fix onto the posts.
(ix) Fix the droppers.

(c) (i) Replace broken droppers/posts etc.
(ii) Replace the wire when it is loose.
(iii) Control pests like termites.
(iv) Replace the struts if broken.

(d) (i) Crowbar - removing the staples from the posts.
(ii) Fencing pliers - cutting the wires and removing staples.
(iii) Chisel - making slots and boring holes on the posts used with a mallet.
(iv) Auger bit - boring holes on the posts.

Sample Paper 8

SECTION A (30 marks)

1. (a) (i) Cause shading effect to the crops.
(ii) Compete for growth factors with the desired crops.
(iii) Require constant trimming.
(iv) Harbour pests.

(b) Bacteria (*Brucella abortus* in cattle).

2. (a) (i) lameness.
(ii) Hind quarters, the shoulders and the chest are swollen.
(iii) Fast and heavy breathing.
(iv) When the swollen parts are touched they crackle.
(v) Grunting and grinding of teeth.
(vi) If the affected muscles are cut they appear dark.

(vii) Bloody froth with a characteristic smell of rancid butter.

(b) To prevent the formation of the spores of the bacteria from spreading.

3. (a) (i) Durability.
(ii) Availability.
(iii) Cost.
(iv) Workability.
(v) Strength of materials.
(vi) Beauty.
(vii) Ease of cleaning.
(viii) Should be serviceable to increase efficiency.
(ix) Weight per unit.

(b) Concrete is a mixture of cement, sand, aggregate and water while mortar is a mixture of cement, sand and water only.

4. (i) To make them last longer.
(ii) To prevent warping because of dampness.
(iii) To prevent damage by weevils and other insects.
(iv) To prevent rotting as a result of fungal attack.

5. (i) By use of given tables.
(ii) Fuller's formula.

6. (i) Making concrete posts for fencing.
(ii) Making walls and floors of buildings.
(iii) Making erosion control structures.
(iv) Making livestock water troughs.

7. (i) 7 m^3 of cement.
(ii) 35 m^3 of ballast.

8. (a) Trocar and Canula.

(b) (i) To establish vertical sections of a structure e.g. bricks.
(ii) To determine or test straight lines horizontally.

(c) A dibber is used for making planting holes (dibbling) in the soil during planting of seeds or seedlings.

9. Papain (a protein-digesting enzyme) used in tendering meat-purifying beer and as a mild laxative.

10. (i) Making binder and baler twines.
(ii) Making ropes.
(iii) Making sacks and baggings.
(iv) Making floor mats.

11. (a) (i) Coastal strip.
(ii) Lake Basin - Kisumu, Bungoma, Busia Districts.
(iii) Kirinyaga.
(iv) Machakos and Kitui.
(v) Bura Irrigation Scheme - Tana River.
(vi) Meru.

(b) (i) Close season.
(ii) Seed-dressing with copper dust.
(iii) Planting resistant varieties of cotton.

12. (i) Open pruning of coffee to discourage the fungus as well as to facilitate effective spraying.

(ii) Spraying with the fungicide (captafol or difolatan).

SECTION B (30 marks)

13. (a) Old engine oil, paints, creosete, pentachlorophenol, dieldrin solution and copper sulphate.
    (b) (i) binding stones or bricks together.
    (ii) provides an even bed for stones or concrete blocks.
    (iii) pointing joints.
    (iv) plastering for good appearance.
14. (a) Quarantine is the restriction of movement of livestock within or outside any given area by law.
    (b) A tick fully inflated after sucking blood.
    (c) Inbreeding is the mating of closely related animals.
    (d) Morant system is the movable rabbit house built of light materials.
15. (i) Kill all the affected birds and burn or bury them.
    (ii) Clean and disinfect houses before bringing in new stock.
    (iii) Vaccination during the first 6 weeks and every 3 months later.
    (iv) Quarantine.
16. Mortality is the number of deaths in a given period.
17. (i) Inherited immunity.
    (ii) Actively acquired immunity.
    (iii) Passively acquired immunity.
18. Prophylaxis.
19. (i) To allow all parts of the plant to get sunlight.
    (ii) To obtain clean fruits by avoiding soiling them.
    (iii) To control diseases such as tomato blight.
    (iv) To make weeding, spraying and harvesting easier.
20. (i) The species of the crop.
    (ii) Stage at which it is harvested.
    (iii) Methods of preparation/ ensiling.
    (iv) Moisture content of the material.
    (v) Degree of compaction in the silo.
    (vi) Sizes of the pieces ensiled.
    (vii) Amount of foreign material included in the silage.
    (viii) Amount of leaves of the ensiled material.
    (ix) Additives.
21. (i) To reduce costs of repair and/or replacement.
    (ii) To increase their durability.
    (iii) To increase the efficiency with which work is done using the tools.
    (iv) To ensure safety of the users.
22. (i) Post-hole digger (auger).
    (ii) Panga.
    (iii) Axe.
    (iv) Hand saw.
    (v) Claw hammer.
    (vi) Hand-hoe.
    (vii) Spirit level/plumb bob.

SECTION C (40 marks)

23.

Disease	*Animals attacked*	*Causes*	*Control Measures*
Foot and Mouth	(i) Cattle and other bovine. (ii) Sheep and goats (iii) Pigs	A virus which exists in seven types	(i) Vaccination (ii) Quarantine (iii) Slaughter and destruction of carcase.
Maastitis	(i) Cattle (ii) Sheep (iii) Goats (iv) Pigs (v) Man	(i) Physical injury to injury to udder (ii) Bacteria e.g. *streptococcus spp.*	(i) Good milking techniques (ii) Antibiotics (iii) Formenting with hot water, soft pads and towels.
Trypano-somiasis	(i) Cattle (ii) Sheep (iii) Goats (iv) Pigs (v) Man	Protozoan called Trapanosome transmitted by tsetse fly.	(i) Eradication of tsetse fly (ii) Use of prophy-lactic drugs e.g. Homidium and Berenil.
Foot-Rot	(i) Cattle (ii) Sheep (mainly) (iii) Goats (iv) Horses and donkeys (v) Camels	(i) Overgrown hoofs (ii) Phyisical damage or injury to the feet by sharp objects (iii) Accumulation or rotting matters in the injured parts. (iv) Bacteria e.g. *streptococcus spp.*	(i) Get rid of sharp objects on the farm. (ii) Trim over-grown hooves of animals (iii) Treat with an-tiseptics after trimming to prevent further infection.

24. (a) (i) Clear the bush and other vegetation and burn trash on the site.
(ii) Rip the land and plough using a disc plough.
(iii) Harrow the land to the required or appropriate tilth.
(iv) Make planting furrow at spacing of 1.2 m to 1.8 m. apart.

(b) (i) Select the right cane from which to obtain planting setts.
(ii) Prepare planting setts; which must have three (3) nodes each.
(iii) Treat the setts by dipping them into hot water or appropriate fungicide against rooting stunting diseases.

(c) (i) Plant setts end-to-end in the furrows 1.2 m - 1.8 m apart.
(ii) Apply phosphatic fertiliser in form of D.A.P. or N.P.K. to encourage early ratooning.
(iii) Cover or bury the setts to a depth of 5 - 7.5 cms.

25. (a) Balance sheet of Mr. Onyancha as at 2/6/91.

Assets	**Shs.**	**Liabilities**	**Shs.**
Fixed Assets			
Land	160,000	D.A.F. Fertilisers	2,000
Buildings	125,000	feeds	600
Tractors	80,000		
Milking machines	10,000		
Office supplies	1,400		
Current assets			
Maize in the granary	9,000		
Cattle	25,000		
Harvested potatoes	5,000		
Beans in sacks	3,000		
Heifer calves	15,000		
Goats	5,000		
Sheep	7,000		
Maize	600		
Dairy meal	600		
Debts receivable	4,000		
Bank	600	Net Worth	449,000
Cash in hand	400		
	451,600		451,600

(b) Solvent.
(c) Yes.
(d) (i) Level of liquidity i.e. current assets and their total.
(ii) Net worth.
(iii) Current liabilities should be lower than current assets.
(iv) Fixed assets should be high.

Sample Paper 9

SECTION A (30 marks)

1. (a) Agroforestry is the practice of land use which involves the growing of trees, pastures and other crops.
(b) (i) A source of wood fuel and other uses of trees.
(ii) Reduces soil erosion because the soil is protected from rains, sun and wind.
(iii) If the trees are leguminous, then they enrich the nutrients status in the soil e.g fixation of nitrogen.
(iv) Labour saving in fetching firewood from far.
(v) Beauty of the environment leads to cool, green and shaded surrounding.
2. (i) Hot water treatment.
(ii) Mechanical breaking (to allow water to enter through the seed coat).
(iii) Burning.

3. Soil erosion is the detachment and carrying away of the top soil by water and wind.
4. (i) Amount and intensity of the rainfall.
   (ii) The slope of the land (Topography).
   (iii) Soil type.
   (iv) Soil depth.
   (v) Vegetation cover.
   (vi) Ploughing up and down the slope.
5. Cover cropping is the growing of a crop which is low lying and grows along the ground to protect the soil from direct rain drops e.g sweet potatoes.
6. (i) Prevents erosion.
   (ii) Increases water infiltration.
   (iii) Smothers the weeds.
   (iv) Conserves moisture.
   (v) Regulates soil temperature.
   (vi) Adds organic matter when they decompose.
7. (i) Because of the intensity of soil loss.
   (ii) It is difficult to heal.
8. (a) Soil is a collection of natural unconsolidated body covering the earth's crust and media in which plants grow.
   (b) (i) Weathering or breaking down process.
   (ii) Synthesis or building up process.
   (c) Soil profile is the vertical section of the strata called horizons. It is a result of soil-forming process over time. The wider or deeper the profile of a soil, the greater will be the ability of that soil to support a wide range of plants.
9. (i) Chlorosis - first appearing on the lower leaves and then progressing to the upper ones.
   (ii) Stunted growth.
   (iii) At advanced stages, leaves start to fall off.
   (iv) Appearance of pigments other than chlorophyll e.g. anthocyanin in tomatoes.
10. (a) (i) They decompose dead organic remains and convert them into humus - which is a source of plant nutrients.
   (ii) Add nitrogen to the soil through nitrogen fixation.
   (b) (i) Texture
   (ii) Structure.
11. (i) Sandy soils.
   (ii) Loam soils.
   (iii) Clay soils.
12. (i) Climatic factors e.g. rainfall.
   (ii) Biotic factors e.g. plants.
   (iii) Type of parent material.
   (iv) Topography of the land.

SECTION B (30 marks)

13. Cut-off-drains channels are made on the farm to divert excess water from upper side of the farm then discharged into river valleys or grounds where erosion cannot occur. Grassed waterways are depressions which are either natural or man-made through which water flow. Grass is planted to slow the speed of water and trap eroded soil.
14. (i) Contour ploughing.

(ii) Minimum tillage and cover cropping.

15. Raindrops fall on bare soil with a force which detaches soil particles from one another and deposits them elsewhere. The loose particles are then carried by water.
16. Erosion where deep and wide channels are formed by the fast flowing water.
17. (a) It is the practice of putting unused land into a utilisable form for agricultural production.
    (b) (i) increase agricultural production.
    (ii) provide employment.
    (iii) settle the landless people.
18. (i) Draining swampy areas by construction of ditches.
    (ii) Control of tsetse flies by clearing the bush.
    (iii) Irrigating dry areas.
    (iv) Planned deforestation.
    (v) Planting trees and constructing soil conservation structures.
19. (i) Maximum use is made of soil and moisture by plants with different growth habits.
    (ii) Control of crop pests minimising build-up; e.g. nematodes.
    (iii) Parasitic weeds e.g. striga are effectively controlled.
    (iv) Nitrogen content of the soil is increased when a legume is included in the rotation.
    (v) Control of diseases by breaking the life -cycles of their agents - particularly soil-borne agents.
    (vi) Soil erosion is checked by crops with effective soil cover.
    (vii) When a grass fallow is included , soil regenerates and regains nutrient depleted during continuous cropping.
20. (a) (i) Improves soil structure through flocculation of soil particles.
    (ii) Amends (lowers) soil acidity.
    (iii) Hastens decomposition of organic matter.
    (iv) Facilitates the availability and absorption of nitrogen and phosphorus.
    (v) Improves legume nodulation and hence nitrogen fixation.
    (vi) Improves drainage of waterlogged soils.
    (b) (i) Nitrogen.
    (ii) Phosphorus.
    (iii) Potassium.
    (iv) Calcium.
    (v) Magnesium.
    (vi) Sulphur.
21. (i) Improves soil aeration.
    (ii) Improves water infiltration and retention in the soil.
    (iii) Improves soil structure.
    (iv) Adds nutrients to the soil after decomposition.
22. (i) Incorporation of crop residues, weeds, etc.
    (ii) Adding organic manures to the soil.
    (iii) Mulching with organic materials.

SECTION C (40 marks)

23. (a) Soil fertility is the ability of the soil to provide growing plants with their nutritional requirements adequately.
    (b) (i) Soil erosion.
    (ii) Leaching of nutrients in the soil.
    (iii) Monocropping - growing one crop continuously on the same land.

(iv) Burning the fields and crop residues after harvesting.
(v) Soil capping i.e. formation of an impervious layer in the soil.
(vi) Weed infestation.
(vii) Alteration of soil pH - making some nutrients unavailable to crops.
(viii) Accumulation of undesirable salts, which impede nutrients availability.

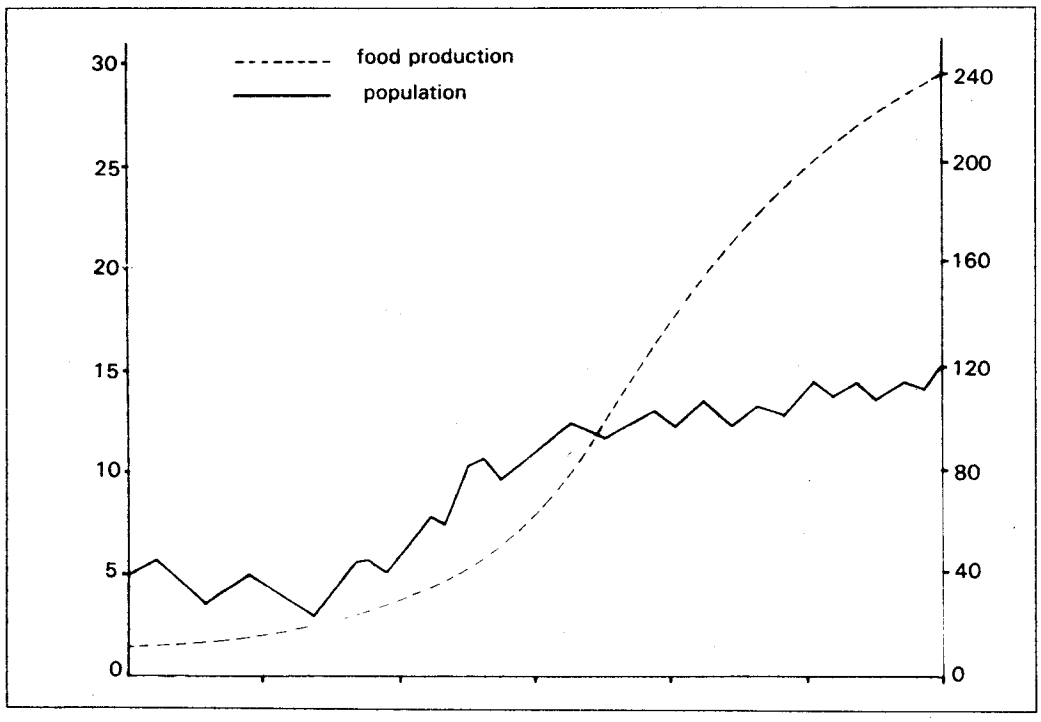
(c) (i) Improvement of water-retention in the soil e.g. through the use of organic manures.
(ii) Crop rotation.
(iii) Maintenance of the right pH value of the soil e.g by liming.
(iv) Drainage to avoid water-logging and hence remove toxic salts.
(v) Erosion control.
(vi) Controlling weeds.
(vii) Maintenance of good nutrient level in the soil through fertiliser application.
(viii) Irrigation where rainfall is limited.

24. (a) A- Planter

(b) 1- Hitching attachment
2- Delivery tube
3- Chain
4- Furrow opener
5- Drive socket
6- Press wheel
7- Seed hopper
8- Fertiliser hopper

(c) (i) Grease the moving parts.
(ii) Clean the hoppers after use.
(iii) Replace lost bolts and nuts.
(iv) Clean the furrow openers after use.
(v) Check the tension of the chains and drive spockets before use.

25. (i) $\frac{\text{Food}}{\text{population}} = \frac{8000 \times 1000}{43000000} = 0.2$ gms/person



Sample Paper 10

SECTION A (30 marks)

1. (a) Low banks of soil built across a slope planted with grass.
   (b) To check the downward flow of water.
2. (i) Simple tools and equipment are used or not mechanised.
   (ii) Production is mainly for subsistence.
   (iii) Slow changes to modern techniques is not easy.
   (iv) Low production.
   (v) Overgrazing of pasture leading to serious soil erosion.
   (yi) Difficult to improve livestock.
3. (i) Food supply.
   (ii) Source of raw materials for industries.
   (iii) Employment opportunities.
   (iv) Foreign exchange earnings.
   (v) Source of capital for development.
4. (a) Fallowing is the practice of leaving the land to revert to bush or to remain uncultivated in order to regain its fertility.
   (b) Ecology is the study of the environment and its interrelationship with animals and plants.
   (c) Young one of a fish.
5. (i) Most of the work is mechanised.
   (ii) Requires skilled and qualified manpower.
   (iii) Large tracts of land is used.
   (iv) Sometimes run by a company or the government or individuals.
   (v) The aim is to produce enough for local consumption and export market.
   (vi) Provides a lot of employment.
   (vii) High production of output,of high quality.
   (viii) Enjoys the economies of scale.
   (ix) Scientific method of farming applied.
   (x) High investment of capital.
6. (a) At low temperatures the pyrethrin content is higher hence higher quality.
   (b) Roles of vegetation cover:
      - Intercepts the rain drops hence reduces their impact on the soil.
      - Roots of the plants hold the soil particles together.
      - Vegetation matter decomposes thus acting as a cementing agent of the soil.
      - Vegetation matter holds the soil moisture by reducing evaporation.
      - Vegetation matter improves water infiltration.
7. (i) Grass improves the destroyed soil structure.
   (ii) They add organic matter thus improving nutrient status of the soil.
8. (i) Conservation of soil moisture by reducing evaporation.
   (ii) Prevent erosion.
   (iii) Improve soil structure.
   (iv) Increase water infiltration into the soil.
   (v) Regulate soil temperature by acting as insulator.
   (vi) Chokes weed growth.
   (vii) Add humus to the soil when they decompose.

9. (i) It provides anchorage/support for the plant.
   (ii) It provides nutrients.
   (iii) It provides moisture.
10. (a) Soil capping is the development or formation of an impervious layer on the soil surface which impedes water infiltration and plant root penetration on the surface of the soil.
   (b) (i) Deep ploughing with sub-soilers.
   (ii) Varying the depth of cultivation from season to season.
   (iii) Application of organic mulch.
11. (i) Size of the crop when established/growth habits of the crop.
   (ii) Soil fertility level.
   (iii) Rainfall reliability/soil moisture.
   (iv) Purpose of the crop.
   (v) Machinery to be used during and after planting operation.
12. (i) It leads to wastage of seeds.
   (ii) Lacks uniformity in spacing.
   (iii) Leads to overcrowding of plants.
   (iv) Uneven germination due to uneven depth of coverage.
   (v) It is difficult to mechanise subsequent operations.
   (vi) It is difficult to establish the correct plant population.

SECTION B (30 marks)

13. (i) The crop will make maximum use of available moisture.
   (ii) Plants are able to make use of "Nitrogen flush" in the soil.
   (iii) Crops mature early hence escape problems of diseases, pests etc.
   (iv) The farmer will get better market prices by selling his crops before there is over-supply of the commodity in the market.
14. (a) (i) Organic matter is destroyed hence the soil will lose its fertility very quickly.
   (ii) Burning leaves the land bare hence soil erosion takes place.
   (iii) Burning destroys useful trees.
   (iv) Burning destroys useful micro-organisms in the soil.
   (v) Fire can destroy houses livestock and fences.
   (b) (i) Photosynthesis.
   (ii) Respiration.
   (iii) Flowering and ripening.
   (iv) Quality of the products.
15. Pastoralism is a major system of keeping livestock and moving with them from one place to another.
16. (i) Overgrazing.
   (ii) Monoculture.
   (iii) Shifting cultivation.
   (iv) Ploughing the land up and down the slope.
   (v) Continuous planting of annual crops on steep slopes of the land.
17. (a) (i) Improves aeration of the soil.
   (ii) Increases the activity of micro-organisms in the soil.
   (iii) Improves soil pH, hence availability of certain nutrients.
   (b) When bare and loose soils are carried in thin layers over a wide area by the effect of water or wind.

(c) (i) Removal of vegetation by grazing.
(ii) Breaking the soil by walking on the land.

18. (a) Diversification is the practice of having different types of enterprises at the same time while specialisation is the practice of concentrating all effort on a single enterprise in the farm.
(b) Subsistence farming is the practice of farming where the produce is mainly for home consumption and the methods used are inferior while commercial farming is the type of farming for sale and applying superior methods of production.
(c) Extensive farming is the practice of farming in large areas while intensive farming uses small area of land and high outputs per unit area of land are obtained.

19. (i) They are expensive in terms of handling due to bulkiness.
(ii) They can be a means of spreading weeds.
(iii) They have less nutrients per given quantity.
(iv) They may harbour insect pests harmful to crops.
(v) They may harbour disease agents harmful to crops.
(vi) It is difficult to determine the amounts of nutrients contained in the quantity applied.

20. Factors considered when selecting planting materials:
(i) Quality of parent plants, i.e. must be high-yielding and vigorously growing.
(ii) Age of the planting materials i.e. do not use seeds which have been stored for long or those which have just been harvested.
(iii) Freedom from damage by pests or diseases.
(iv) Physical form of the seeds. Avoid malformed seeds - they may be either damaged or do not have enough nutrients for resulting seedlings.
(v) Purity e.g. free from foreign materials.

21. (i) Movement of animals in large groups.
(ii) Man's activities e.g. cultivation, mining, road and railway construction.
(iii) Micro-organisms - decomposing plant and animal remains and adding to the soil.
(iv) Earthworms, termites, moles, etc, mix up the soil.
(v) Higher plant roots force their way through the rock crevices and further break them physically.

22. (a) Landside: It counteracts the side thrust and hence stabilizes the plough during ploughing operations.
(b) Mouldboard: It receives and inverts (turns over) the furrow-slices during ploughing operations.
(c) Coulter: It marks a vertical first cut through which the share penetrates the soil and cuts off the furrow-slices.

SECTION C (40 marks)

23. (a) A knapsack sprayer is a widely used sprayer which is usually hand-operated and carried (slang) over the shoulders of the operator.
(b) How it works:
(i) It is usually carried strapped to the back or shoulders of the operator.
(ii) The tank carrying the spray liquid is pressurised by use of a build-in pump which is operated by a hand -lever.
(iii) Spray liquid under pressure is released (ejected) through the nozzle via a rubber hose and hand lance.
(iv) Operator controls the amounts and rates of spray-release by means of a trigger control valve.

(v) When spray liquid is exhausted the operator refills the tank and resumes operation again.

(c) (i) Empty the tank completely after every working session.
(ii) Use clean water to wash the tank and other accessories thoroughly.
(iii) Use detergent to remove every trace of spray liquid so as to avoid corrosion of parts of the sprayer.
(iv) Disassemble the nozzles, filters, hoses and flush them thoroughly with clean water to remove any foreign matter e.g dust or soil particles.
(v) Dry the parts.
(vi) Grease the metal parts after cleaning and when sufficiently dry to prevent rusting.
(vii) Store the equipment, after re-assembling, in a clean dry place.

24. (a) Signs of internal parasite infestation:
(i) Loss of weight i.e.animals become thin and weak or emaciated.
(ii) Animals are pot-bellied.
(iii) May develop swellings in their jaws, due to fluid accumulation.
(iv) Animal are anaemic due to loss of blood to parasites.
(v) Rough coat of hair/staring coat.
(vi) Diarrhoea.
(vii) Constipation.
(viii) Coughing.
(ix) Loss of appetite.
(x) Eating too much.
(xi) Retarded growth.
(xii) Presence of worm eggs, segments or blood stains in the animal faeces.

(b) Measures that could be taken to control internal parasites:
(i) Rotational grazing and isolation of danger-spots e.g. swampy areas.
(ii) Drench animals with anthelmintic drugs.
(iii) Thorough cooking of pork and beef before eating.
(iv) Humans should use pit latrines and not defaecate anywhere on the pasture.
(v) Eradicate alternate hosts or carriers of worms.
(vi) Drain swampy pastureland.
(vii) Inspect animal carcasses before they are used for food.
(viii) Isolate suspected animals and treat them with appropriate drugs.

(c) Examples of internal worm parasites:
(i) Liverfluke.
(ii) Roundworms.
(iii) Tapeworm.

25. (a) (i) Lack of enough capital for investment.
(ii) Pests and diseases to both crops and animals.
(iii) Unpredictable climatic conditions.
(iv) Fluctuation of market prices for agricultural produce.
(v) Lack of adequate storage structures therefore high losses due to spoilage.
(vi) Inadequate technical knowhow.
(vii) High density of population leading to over-use of land hence encouraging soil erosion.
(viii) Poor means of communication from the rural areas to the urban centres.
(ix) Perishability of some of the agricultural products e.g. horticultural crops.
(x) Agricultural products are bulky hence difficult to transport.

(xi) Low prices of agricultural products compared to high prices of agricultural inputs.

(b) (i) Proper preservation methods e.g. dehydration, canning, bottling.
(ii) Good means of communication between production areas and industries.
(iii) Proper location of industries dealing with bulky agricultural products.
(iv) Provision of proper extension services.
(v) Provision of certified seeds to the farmers and improved A.I services in livestock.
(vi) Provision of credit facilities to the farmers.
(vii) Formation of cooperative societies to organise the transportation and marketing of the farm produce.
(viii) Control of pests and diseases by use of appropriate chemicals.
(ix) Provision of irrigation facilities in the dry areas.
(x) Construction of adequate storage structures of the farm produce.
(xi) Fixing and control of prices by the government.

Sample Paper 11

SECTION A (30 marks)

1. (i) Are able to walk long distances in search of food and water without getting tired.
(ii) Tolerant to tick-borne diseases.
(iii) Can tolerate high ambient temperatures because of more active sweat glands and large surface area.
2. (a) It is the response of plants to varying lengths of daylight during a 24-hour period.
(b) (i) Suitable pH.
(ii) Deep fertile soil.
(iii) Gently sloping land.
(iv) Soil rich in plant nutrients.
(v) Able to retain moisture.
(vi) Good climatic conditions in the area.
3. (a) Refers to domesticated animals like cattle, poultry, sheep, goats, pigs, bees and fish.
(b) Is the study of soil science.
(c) Is the study of insect.
4. (i) Lack of enough land for more enterprises.
(ii) Lack of enough capital for the various enterprises.
(iii) Lack of specialisation i.e the farmer will have divided attention.
5. (a) Gabions are boxes of galvanised wire mesh filled with stones and built across slopes or gullies. They trap the soil as water flows through the stones and reduce the velocity of the running water.
(b) (i) Wire mesh of a suitable size.
(ii) Stones.
(iii) Iron rods.
(iv) Wire for linking mesh wire.
6. (i) Both hold and store water.
(ii) In storing water they reduce the speed of run-off.
7. Climate refers to the average weather conditions of a place which has been studied and

recorded over a long period i.e. more than 15 years while weather refers to the changes that occur in the atmosphere in a particular place within a period of 24 hours.

8. (a) Propagation is the development and multiplication of new individual crops from the existing ones.

(b)

Propagation:	**Crop**
(i) Use of seed	Maize, Beans, Cotton, Coffee, Tomatoes, Cabbage.
(ii) Bud-grafting.	Citrus fruits.
(iii) Stem-cuttings.	Tea, cassava, sweet potatoes, sugarcane.

9. Top-dressing/side-dressing/Foliar-feeding.
10. Soil Structure.
11. (i) Spacing determines plant population per given area of land.
    (ii) Correctly spaced crops achieve high quality produce.
    (iii) High yields are obtained when crops are correctly spaced.
    (iv) Correct spacing facilites optimum use of nutrients and moisture.
    (v) Correct spacing permits the use of specified machinery for inter-row operations e.g weeding, spraying, harvesting, etc.
12. (a) (i) Nature of the seed-coat or testa.
    (ii) Environmental conditions e.g.moisture level and temperature of the immediate surroundings.
    (iii) Age of seeds/stage of seed development.
    (b) (i) Addition of organic matter.
    (ii) Intercropping unrelated crops e.g. legumes and cereals.
    (iii) Fallowing.
    (iv) Minimum tillage.
    (v) Proper crop rotation including a grass ley.
    (vi) Tilling the soil at the right moisture content.
    (vii) Liming.

SECTION B (30 marks)

13. (i) Compete with the desired crops for nutrients.
    (ii) One may serve as alternate host of pests and diseases to the other.
14. (a) Long day plants are plants which require 13-15 hours of light to produce flowers.
    (b) Short day plants are plants which require 8 hours to produce flowers.
    (c) Neutral-day plants require 12 hours of light to produce flowers e.g. tropical crops.
15. (i) Keeps the earth warmer than the atmosphere.
    (ii) Green house traps the sun's heat to remain on the lower atmosphere to initiate water cycle hence we receive rainfall.
16. (a) (i) Nutrients and moisture are utilised to their maximum.
    (ii) Legume crops in the mixture enrich the soil with nitrates.
    (iii) Provides better soil cover hence reduce soil erosion.
    (iv) The total yields per unit area are high.
    (v) The farmer feels secure; if one crop fails he has the other crops to support him.
    (b) Mixed cropping is the planting of different crops in different plots on the same farm in one season.
    (c) Reduces the slope of the land. This reduces the velocity of surface runoff.
17. (a) Graded terraces have drainage channel to lead off excess water to a vegetated area while level terraces have no outlet channels; the objective is for the water to infiltrate into the soil only.

(b) Spirit level, string, shovels, fork jembe, pangas.

18. (i) Infertile subsoil will be exposed.
    (ii) Landslide can easily occur.
19. (i) A source of hydrogen and oxygen necessary for photosynthesis in crop plants.
    (ii) It is a solvent to all plant nutrients, which must be taken up by plants in solutions.
    (iii) It is a medium of transport as minerals are conducted from the soil to the leaves; and the synthesised food from the leaves to the rest of plant body.
    (iv) It is a medium for all chemical reactions in plant bodies.
    (v) Water cools the plant bodies; regulation of temperature.
    (vi) Water maintains plant cells turgid and alive.
20. (a) (i) Soil water.
    (ii) Soil air.
    (iii) Organic materials - including humus and particularly decomposed plant and animal remains.
    (iv) Mineral salts - dissolved in soil water and are absorbed by roots.
    (v) Living organisms - higher plant roots, micro-organisms, termites, earth worms, etc.

    (b) (i) Ammonium Sulphate.
    (ii) Ammonium Sulphate Nitrate.
    (iii) Calcium Ammonium Nitrate.
    (iv) Urea.
21. (i) Size of the land. It is more suitable on a smaller piece of land.
    (ii) Level of capital investment. When a farmer cannot afford a tractor-drawn plough.
    (iii) Topography of the land. Ox-plough may be used on slopy land where tractor plough cannot work.
    (iv) Technical knowledge of the farmer or its availability from other sources.
22. (i) Decomposition of dead organic matter into humus.
    (ii) Fixation of nitrogen in the soil.
    (iii) Digestion of grass and other fibre in the rumen of ruminants.
    (iv) Fermentation and conservation of forage in the silo.
    (v) Fermentation of milk to make yoghurt.

SECTION C (40 marks)

23. (a) (i) Cotton is propagated by seeds.
    (ii) Certified seeds are available from the Ministry of Agriculture.
    (iii) Where certified seeds are not available, farmers may obtain and treat local seeds before planting.

    (b) (i) Clear the site of vegetation.
    (ii) Dig out and remove plant roots or stumps.
    (iii) Eradicate grass weeds e.g couch grass, which are difficult to get rid of later.
    (iv) Prepare planting holes at spacing of 30 cm x 90 cm or 45 cm x 90 cm.

    (c) 1 - American Bollworm:
        (i) Destroys squares, young shoots and developing bolls.
        (ii) Controlled by use of insecticides carbaryl e.g or endosulfan.

    2 - Cotton stainerbug:
        (i) More destructive in drier areas.
        (ii) Adults introduce a fungus which stains and down-grade cotton lint.
        (iii) Controlled by use of trap-crops.

(iv) Biological control by use of chickens.
(v) Use of insecticide.

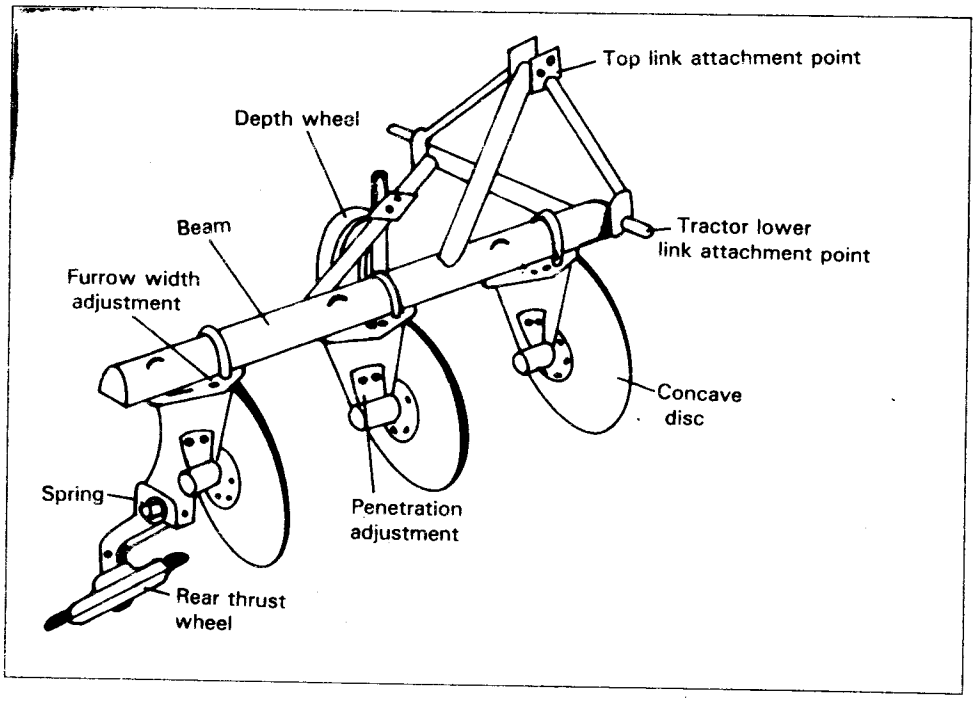
(d) (i) Ready for harvesting 6-9 months after planting.
(ii) Harvested during dry season.
(iii) It involves picking lint by hand and is therefore labour-demanding.
(iv) It is done on weekly intervals .
(v) Sorting is done simultaneously with picking.
(vi) Pickers use two baskets, one for collecting unstained lint and the other for stained lint.
(vii) Grading is done on the basis of whether the lint is stained or not. Unstained lint is graded A and stained one is graded B.
(viii) Do not use sisal bags; their fibres may mix with cotton.

24. (a) (i) Macro-economics refers to the economic problems when analysed on national or aggregate basis e.g. National Income, International trade etc. while micro-economics is when economic problems are analysed on the basis of a firm.
(ii) Gross Domestic Product is the sum total of goods and services produced by a country within a period of one year while per capita income is the Gross National Income divided by the number of people living in a country.

(b) At higher prices, less of a certain commodity is demanded and at lower prices more is demanded. At higher prices the producer offers more for sale and vice versa at lower prices in the market.

(c) Equilibrium price is determined where the demand and supply are equal.

25. (a)



(b) (i) Hitchmast - provides a 3 points hitch to the tractor hydraulic system.

(ii) Frame/Beam - Adds weight to the plough and provides points of attachment for support for the other parts of the plough.
(iii) The standard - Is the part that connects the concave disc blades to the frame.
(iv) Disc blades - Cut and invert the furrow slices or digging of the soil.
(v) Hub - Part which connects the standard to the disc blades. It also enables the disc to rotate smoothly so as to cut and invert the soil.
(vi) Scrappers - Help in removing or scrapping off mud or soil that cling to the discs.
(vii) Rear furrow wheel - Adds weight therefore it stabilises the plough, presses against the furrow wall and helps in the control of depth of ploughing.

(c) (i) Lubricate the rotating parts regularly to reduce friction and wear.
(ii) Replace or tighten loose bolts and nuts.
(iii) Replace or repair worn out or broken parts.
(iv) Coat the shiny parts with old engine oil to prevent rusting.
(v) Clean and remove mud at the end of each day's work.
(vi) Store the implement under a shed during off season.

Sample Paper 12

SECTION A (30 marks)

1. (a) Crop rotation is the growing of different crops in an orderly sequence on the same field.
(b) (i) Maximum utilisation of nutrients in the soil, e.g. different crops feed at different depths.
(ii) Control of pests due to absence of alternate host.
(iii) Control of diseases e.g life cycles of disease causing organisms are broken.
(iv) Control of parasitic weeds e.g.*striga spp* in cereal crops.
(v) Adds fertility to the soil if a legume is included.
(vi) Soil structure is improved particularly when grasses are included..
2. (i) More land is required for arable farming (high rate of population growth).
(ii) Pests and diseases which destroy trees.
(iii) Lack of adequate education to the farmers on the importance of trees.
(iv) High demand for trees.
(v) Lack of species of trees suitable for different ecological zones.
3. (a) (i) Provision of tree seedlings suitable to particulars areas.
(ii) Training of the farmers on the importance of trees.
(iii) Research programmes on trees.
(iv) Encouraging farmers to plant trees in catchment areas and river banks.
(b) (i) Provide timber.
(ii) Provide medicinal drugs.
(iii) Provide fuel.
(iv) Provide food e.g. fruits.
(v) Provide livestock feeds.
(vi) Forest trees conserve soil and water.
(vii) Forest trees modify the climate of a place e.g. attract rain.
(viii) Are home to wildlife.
(ix) Provide beauty (have aesthetic value).

4. Rain gauge.
5. (i) Temperature.
   (ii) Rainfall.
   (iii) Humidity.
   (iv) Wind.
   (v) Sunlight.
6. Arable farming refers to the growing of crops in farms. It excludes livestock keeping.
7. (i) Situated in marginal areas where pastures are poor.
   (ii) The system is extensive.
   (iii) Extension services are provided.
   (iv) Improved pastures.
   (v) Selective breeding of livestock.
   (vi) High level of livestock management.
8. (a) At 12 months after planting in the nursery or at 3-4 leaf-stage of growth.
   (b) (i) Bread (ii) Cakes (iii) Biscuits
   (iv) Macaroni (v) Buns (vi) Scones.
9 (a) (i) Chinchilla (ii) Earlops (iii) New Zealand White (Kenya white)
   (iv) Californian (v) Angora (vi) Fleming giant.
   (b) (i) Farrowing is the giving of birth to a young one in pigs.
   (ii) Kindling is the giving of birth (parturition) in rabbits.
10. (i) Open pruning and clean weeding.
   (ii) Spraying with copper sprays.
   (iii) Growing resistant varieties e.g. Ruiru II.
11. (i) Burning the pastures after a grazing session.
   (ii) Mowing with rotary mowers to cut down the weeds and encourage grass regrowth.
   (iii) Slashing with slashers or pangas.
   (iv) Rogueing or uprooting.
   (v) Use of selective herbicides.
12. (a) (i) Creep feed or ration.
   (ii) Sow and weaner meal.
   (iii) Fatteners or Finishers' ration.
   (b) Tupping is the mating of a ram and ewe for insemination purposes.

SECTION B (30 marks)

13. (i) To determine the type of crops to be grown.
   (ii) To determine the time for various farm activities e.g. planting.
   (iii) Necessary when designing dams.
   (iv) Necessary when putting up irrigation schemes.
   (v) Necessary when building bridges in road construction.
14. (a) (i) Provides more employment to the people.
   (ii) Provides the government with revenue in form of taxes.
   (iii) High output is obtained.
   (iv) Earns the country foreign exchange because of export products.
   (v) Enjoys the economies of scale.

(vi) A number of activities can be done by the company e.g. processing of the products.

(b) (i) Encourage over-dependence on one enterprise.
(ii) High initial capital is required.

15. (i) Arable farming.
(ii) Pastoralism.
(iii) Mixed farming.

16. (i) Plantation.
(ii) Ranching.

17. (i) Rainfall reliability.
(ii) Rainfall distribution.
(ii) Rainfall intensity.

18. (i) Topography of the land.
(ii) Amount of rainfall and intensity.
(iii) Vegetation cover.
(iv) Type of soil.
(v) Faulty farming methods e.g. overstocking.
(vi) Soil depth.

19. (i) An inlet for fresh supply of water.
(ii) A spillway channel to take off overflow or excess water.
(iii) An outlet to drain off water when it is necessary to clean and replace pond water.
(iv) Fence to keep off predators and other intruders.
(v) Screen to prevent escaping of fish or bringing in unwanted fish.

20. (a) Swarming is the movement of a colony or part of it from a hive.

(b) (i) Shortage of food and water in the immediate surrounding of the colony.
(ii) Death of the queen.
(iii) Attack by predators.
(iv) Adverse conditions in the hive e.g. overheating, leaking hive.
(v) Pollution of the surroundings e.g. by chemical sprays.
(vi) Overcrowding in the hive.
(vii) Disturbance in the hive.

21.

Disease	*Control Measures*
1. Anthrax	(i) Vaccination (ii) Quarantine (iii) Proper disposal of carcasses
2. Foot and Mouth Disease	(i) Vaccination (ii) Quarantine.
3. Mastitis	(i) Proper and regular milking (ii) Antibiotics.

4. Tuberculosis	(i) Vaccination (ii) Avoid overcrowding in housed animals. (iii) Antibiotics use.
5. Enterotoxaemia	Vaccination
6. Trypanosomiasis	Control of tsetsefly by clearing bushes and using insecticides.
7. Heartwater	Control of ticks by all applicable methods.
8. Brucellosis	Controlled breeding and proper sanitation in handling of aborted foetuses.

SECTION C (40 marks)

22. (a) (i) Pyrethrum is propagated by use of vegetative materials; - splits.
(ii) Splits should be obtained from exceptionally high quality parent plants called clones.
(iii) The clones are obtainable from pyrethrum Board's Nurseries.
(iv) Avoid damage to the roots from the time of splitting to planting.
(v) Keep them well-watered during the same period.

(b) (i) Clear and cultivate the land well in advance.
(ii) Ensure that grass weeds like couch grass are thoroughly removed.
(iii) Prepare land to the required degree of tilth.
(iv) Make planting holes at spacing of 30 cm by 60-90 cm.
(v) Prepare ridges at 60-90 cm apart.

(c) (i) Plant the splits on the same day they are lifted from the nursery.
(ii) Plant when the field is sufficiently wet.
(iii) Plant late in the evening.
(iv) Plant splits to the same depth as they were in the multiplication nurseries.
(v) Apply about 30 gms of double superphosphate per planting hole.

(d) (i) Pyrethrum is ready for harvesting 4-5 months after planting in the field.
(ii) Harvesting involves picking only fully opened flowers.
(iii) Harvesting continues for about nine months at weekly intervals.
(iv) Use woven basket when harvesting to avoid premature fermentation of the flowers.
(v) Handle flowers carefully to avoid damage.
(vi) Dry the flowers gradually to a moisture content of 10-12%.
(vii) Dry flowers immediately after picking to prevent fermentation.
(viii) Dispatch flowers to the factory immediately for further processing.

23. (a) A parasite is any organism that depends on another organism (host) for nourishment and at times for protection and shelter.

(b) (i) Ticks transmit diseases.
(ii) They suck blood from and cause anaemia to their host animals.
(iii) They cause irritation and discomfort to their hosts.

(iv) They lower the quality of hides and skins hence market value.
(v) Tick cause a disease called 'sweating disease' or tick paralysis.
(vi) Ticks increase costs of production in livestock.

(c) (i) Use of prophylactic drugs e.g. antibiotics.
(ii) Proper sanitation and use of antiseptics in premises and cleaning equipment.
(iii) Quarantine and isolation measures.
(iv) Slaughter and destruction of affected animals.
(v) Routine vaccination of livestock.
(vi) Destruction of disease vectors e.g. ticks or tsetseflies.
(vii) Proper feeding of livestock.
(viii) Proper milking techniques to avoid mastitis.
(ix) Avoid breeding disease by use of artificial insemination.
(x) Proper disposal of carcasses.
(xi) Proper housing to avoid overcrowding.
(xii) Treatment of affected animals to reduce chances of disease spreading.
(xiii) Avoid physical injuries to animals caused by sharp objects.
(xiv) Practice rotational grazing to control internal parasites.
(xv) Prevention of stress factors.

24. (a) Principle of substitution states that when the output is constant, it is profitable to substitute one input factor for another as long as that input is cheaper than the second one.

(b) In constant rate of substitution input factors substitute one another at a constant rate for each level of output while varying rate of substitution is where the input factors substitute one another at varying rates.

(c) (i)

Sow and weaner meal in kg.	**Home made feed in kg.**	**Marginal rate of substitution (MRS)**
2	39	.....
3	30	9
4	23	7
5	18	5
6	14	4
7	12	2
8	11	1
9	10	1

(ii) 6 kg of Sow and Weaner meal and 14 kg of Home-made feed at Sh.23.20.

Sample Paper 13

SECTION A (30 marks)

1. Soil conservation is the use of resources without rendering them unproductive due to erosion or depletion of plant nutrients.

2. (i) Production for home consumption.
   (ii) Simple tools are used.
   (iii) Low standard of living.
   (iv) Most of the work is done by family labour.
   (v) Intercropping is common.
   (vi) Land is under-utilised.

3. (i) Rainfall (ii) Temperature (iii) Wind
   (iv) Light (v) Soil (vi) Topography

4. (i) Limited capital for investment.
   (ii) Use of rudimentary tools and equipment.
   (iii) Land cultivated is normally small.
   (iv) Slash-and-burn technique is used as a means of clearing the vegetation.
   (v) No proper management on crops planted.

5. Farmers who move with their livestock looking for pastures for part of the year then settle in one place for the rest of the year. They live in temporary homesteads and cultivate some crops.

6. (i) Cotton - Textile industry.
   (ii) Milk - KCC factories.
   (iii) Wheat/Barley - Breweries.
   (iv) Pineapples - Fruit canning factories e.g.at Thika.
   (v) Cereal crops - Unga Feeds Ltd.
   (vi) Tea - Tea Industries.
   (vii) Coffee - Coffee factories.
   (viii) Pawpaws - Wine Industries.
   (ix) Mulberry - Textile industries.
   (x) Sugar cane - Sugar industries.
   (xi) Fruit crops - Fruit canning factories etc.

7. Sedentary Agriculture is the type where animals are grazed near homestead and animals are penned in a boma at night, and during the day they are allowed to graze extensively. e.g. at marginal areas.

8. 20 kg. P_2O_5 are contained in 100 kg. N.P.K.(20:20:0).

$$30 \text{ kg.} P_2O_5 \text{ contain } \frac{100 \times 30}{20}$$
$$= 150 \text{ kg.N.P.K.}$$

9. Ways to improve the ability of a water-logged clay soil to sustain plant growth.
   (i) Application of organic matter e.g. by use of manures.
   (ii) Drainage of excess water.
   (iii) Applying lime (liming).
   (iv) Planting trees or grass that withdraw a lot of water.
   (v) Avoiding over-cultivation.

10. A farmer would choose to use a disc rather than a mouldboard plough for the following reasons:
   (i) There are minimum chances of breakage because the discs ride or roll over obstacles.
   (ii) Discs work better in dry or sticky and hard soils than mouldboards.

(iii) Maintenance costs are relatively lower with the disc than with mouldboard ploughs.
(iv) Discs require less tractor power to pull than mouldboards.

11. Monocropping is the practice of growing only one type of crop on the same piece of land season after season.

12. Characteristics of nitrogenous fertilisers:
(i) High solubility and liability to leaching.
(ii) Scorching effect on crops when in direct contact.
(iii) Highly volatile and easily lost through vaporisation.
(iv) Are very hygroscopic and can easily cake up in storage if not properly covered.

SECTION B (30 marks)

13. (i) Type of enterprise itself.
(ii) Environmental factors.
(iii) Knowledge and skills of the farmer about the enterprise.
(iv) Available resources.
(v) Cultural factors e.g. traditions or cultural values
(vi) Government policy.

14. (i) Slope of the land.
(ii) Rainfall intensity and amount.
(iii) Type of soil.
(iv) Vegetation cover.

15. (i) Poor farming methods e.g. planting the same crop on the same plot for too long.
(ii) Overstocking which causes removal of vegetation cover.
(iii) Burning of vegetation.
(iv) Deforestation especially on steep slopes.
(v) Cultivation of the river banks etc.

16. (i) Good farming practices aimed at maintaining good soil fertility and good soil structure e.g. strip cropping, mulching, crop rotation etc.
(ii) Construction of soil erosion control structures e.g.Terraces, gabions, cut-off drains and grossed waterways.
(iii) Enforcement of the regulation, e.g. leaving 16 m wide of the river banks uncultivated.
(iv) Adopting proper stocking rates.

17. (i) Deforestation is the indiscriminate cutting down of forest trees. It could be planned or unplanned.
(ii) Reafforestation is the establishment of a forest where there was one previously but had been destroyed by fire or indiscriminate cutting down.

18. (i) Inspection and sorting out.
(ii) Hardening e.g. potato tubers to minimise bruising.
(iii) Drying or freezing.
(iv) Chemical treatment e.g. with pesticides.
(v) Processing.
(vi) Keeping in protective containers - tinning, canning or bottling.
(vii) Addition of preservatives.

19. (i) Type of animal from which the manure is obtained e.g poultry manure is of the highest quality.
    (ii) Type of food eaten by the animal.
    (iii) Materials used as litter in the premises where the manure is collected.
    (iv) Method of storage after collection.
    (v) Length of time that elapses before the manure is used.

20. (i) Physical conditions of the site of the seedbed.
    (ii) Tilth required before planting.
    (iii) Depth of cultivation required.
    (iv) Financial status of the farmer.
    (v) Time remaining before planting date.

21. (i) Flood irrigation.
    (ii) Basin irrigation.
    (iii) Furrow or trench irrigation.
    (iv) Sprinkler or overhead irrigation.

22. (i) Drying in the sun.
    (ii) Smoking.
    (iii) Salting.
    (iv) Refrigeration.

SECTION C (40 marks)

23. (a) A seedbed is an area of land that has been prepared in such a way that it is ready to receive planting materials.
    (b) Factors considered when preparing a seedbed:
        (i) Initial physical condition of the land.
        (ii) Weather/moisture content of the soil.
        (iii) Machinery/tools to be used during the preparation.
        (iv) Type of planting materials to be used.
        (v) Economic returns/cost factors.
        (vi) Soil type of the site.
        (vii) Time before planting.
        (viii) Topography of the land.
    (c) (i) Cut down trees (if any) and clear bushes.
        (ii) Dig out tree stumps and roots (if any).
        (iii) Burn or side-row the trash (rubbish) with rake.
        (iv) Dig or cultivate the ground to required depth.
        (v) Remove weed stolons, rhizomes etc.
        (vi) Break large soil clods to get the required tilth.
        (vii) Finish off by rolling, firming,ridging or raking as necessary.
        (viii) Level and make planting holes or furrows ready to plant.

24. (a) Bacteria (*salmonella gallinarium*).
    (b) (i) Carried by contaminated food and water.
        (ii) Transmitted from carrier hens to chicks through eggs.
    (c) (i) Drowsiness.
        (ii) White yellowish or greenish diarrhoea.
        (iii) Noisy breathing.
        (iv) Drooping of wings.

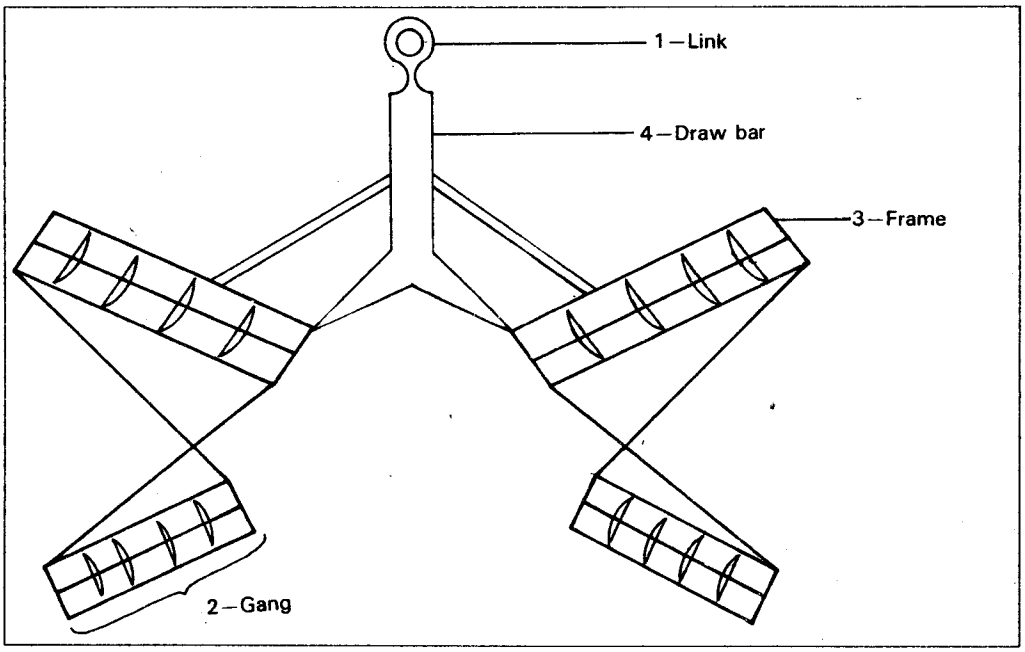
(v) Anaemia in chronic cases.
(vi) Sudden death in acute cases.
(vii) High temperatures.

(d) (i) Killing affected birds.
(ii) Thorough clearing and disinfection of poultry house.
(iii) Regular vaccination.
(iv) Treatment of chicks with antibiotics.

25. (a) To produce a fine, smooth and level the seedbed in readiness for planting.

(b) (i) Angle of gang of concave discs to the direction of travel or pull.
(ii) Depth control done by use of hydraulic force etc.
(iii) Adjustment of the spaces of the discs.

(c) Disc harrow



(d) (i) Sharpen the disc blades and replace worn out ones.
(ii) Replace all loose or worn out bolts and nuts.
(iii) Check and adjust the angle of the gang of discs.
(iv) Lubricate the bearings of the rotating parts.
(v) Clean the equipment after use and remove sticky materials.
(vi) Coat the implement with oil to prevent rusting on the shiny parts.
(vii) Store the implement in a rain-proof shed.
(viii) Paint the frame/Beam to prevent rusting.

Sample Paper 14

SECTION A (30 marks)

1. Primary tillage is the opening up of the virgin land for the first time while secondary tillage is the subsequent cultivation after primary tillage to make the seedbed have fine tilth ready for planting.
2. (i) Stem growth starts immediately the seed is planted.
   (ii) Crops from chitted seeds yield more than those from unchitted.
   (iii) Chitting encourages the development of short, green and healthy sprouts.
   (iv) Sprouts from chitted seeds are uniform in growth and maturity, since the poor non-sprouting tubers will have been eliminated.
3. (i) Pests and diseases are easily checked because of closer supervision.
   (ii) It is suited to small seeds whose seedlings are delicate and require special attention.
   (iii) It is more convenient and avoids damage to the roots when transplating.
4. Types of indigenous breeds of cattle (*Bos indicus*): Boran, Nandi, Bukedi, Masai, Tanganyika and Zanzibar cattle, Ankole cattle and Nganda cattle. Exotic breeds of cattle in Kenya (*Bos taurus*):Friesian, Ayrshire, Guernsey, Jersey, Hereford, Shorthorn, American Brahman, Santa Getrudis and Galloway Simmental.
5. (i) Harrows (iv) Rollers
   (ii) Cultivators (v) Rotavators
   (iii) Ridgers
6. Browsing in goats is the eating of leaves, bark of trees and twigs of shrubs.
7. (i) Problems of vermin, insects and fungi.
   (ii) Problems of dampness in the stores which cause rotting of the grain crops.
   (iii) Lack of proper storage facilities e.g stores, bins and bags.
   (iv) Inadequate technical know-how on seed dressing and storing.
   (v) Lack of enough capital to build storage structures and buy storage chemicals.
8. Gross National Product (G.N.P) is the sum total of G.D.P. and the differences between income inflow and income outflow. It represents the total income earned within the country and from abroad.
9. Categories of capital as a factor of production:
   (i) Fixed or Durable capital-representing all assets having more than one year of useful life.
   (ii) Working or circulating capital. This consists of assets that can easily and readily be converted into real and productive capital. Examples include fertilisers, fuels, livestock feeds, pesticides, etc.
   (iii) Liquid capital - include cash at hand and bank deposits.
10. Profit maximisation means obtaining the highest net returns (net revenue) on invested capital. This happens when the difference between total revenue and total cost (TR-TC) is highest.
11. (i) Phosphorus encourages formation, development and early establishment of plant roots.
    (ii) It dissolves slowly hence takes long to be depleted in the soil.
12. (i) Type of animal from which manure is obtained.

(ii) The age of the animal.
(iii) The type of plant used as litter.
(iv) Composition of food eaten by animals.
(v) Method of storage.
(vi) Age of farmyard manure.

SECTION B (30 marks)

13. (i) Should be raised by about 50 cm above the general ground level.
(ii) Posts and pillars should have rat bufflers and smooth surfaces.
(iii) Should be well ventilated
(iv) Should be rain-proof and not damp.
(v) Should not have corners, cracks or crevices which act as hiding places of pests.
(vi) Should be burglar-proof.

14. (a) (i) It is very expensive to instal pipes, sprinklers and purchase a water pump.
(ii) Encourage fungal diseases e.g CBD in coffee, blight in potatoes etc. due to the accumulation of water on the leaves.
(iii) Can cause soil erosion on slopy areas.
(iv) Can cause soil capping leading to surface run-off.
(v) Not effective under windy conditions because of wind drift.
(vi) Maintenance and operation of the system requires skilled persons.

(b) (i) A lot of water is wasted through evaporation and seepage.
(ii) Can cause soil erosion.
(iii) Not applicable where land is slopy.

15. (i) Easy to clean.
(ii) Durable.
(iii) Resistant to fires.
(iv) Resistant to insects and fungal attack.

16. (i) Amount of water available.
(ii) Topography.
(iii) Type of soil.
(iv) Type of crop.
(v) Capital available.

17. (i) Piston pumps.
(ii) Centrifugal pumps.
(iii) Semi-rotary pumps.
(iv) Hydraulic ram pumps.
(v) Jet pumps.
(vi) Diaphragm pumps.

18. (i) To kill disease-causing micro-organisms.
(ii) To remove chemical impurities e.g. excess fluoride.
(iii) To remove bad smell and taste.
(iv) To remove sediments of solid particles e.g.soil particles.

19. (i) Timely cultivation and planting using correct spacing and seed-rates.
(ii) Using certified planting materials and recommended fertilizers and/or manures.
(iii) Use of correct and timely application of agro-chemicals e.g pesticides and herbicides.
(iv) Timely weeding, pest and disease control and harvesting

(v) Proper storage of crop produce.
(vi) Treatment and processing to improve and sustain quality.
(vii) Efficient transportation to the market points.

20. (i) Education extension and training.
(ii) Artificial insemination service to improve livestock breeding.
(iii) Banking services to enable the farmers to save part of their income for future in vestment.
(iv) Farm input suppliers.
(v) Farm machinery services e.g. tractor hire services.
(vi) Credit facility services.
(vii) Marketing outlets and agencies.

21. (a) Budgeting is the estimation of inputs and outputs, both physically and financially, in a production process.
(b) (i) Complete budget - involving all the enterprises undertaken on the farm.
(ii) Partial budget involves a specific enterprises.

22. (i) Estimating future profitability and capital requirements.
(ii) Seeking credit facilities from lending institutions.
(iii) Submitting tenders for farm tenancy or sale.
(iv) Estimating or determining future taxes on farm income.

SECTION C (40 marks)

23. (a) Cost is the price paid for goods (commodities) delivered or services rendered, by a customer or consumer.
(b) Variable costs are costs which, in a given time period, vary or change with the level of production; whereas fixed costs are those which do not change or alter with the level of production (output).
(c) Examples of:
(i) Variable costs:
. Livestock feed costs
. Fuel costs
. Seeds costs
. Agro-chemical costs
. Casual labour costs
. Hired transport costs
. Veterinary costs

Fixed costs:
. Depreciation of machinery
. Rent.
. Buildings.
. Salaries of permanent labour.

(d) Agents and organizations involved in the marketing of agricultural produce are:
(i) Itinerant traders who move from place to place buying produce directly from farmers.
(ii) Processors. These may include co-operatives and statutory marketing boards.
(iii) Brokers and commission agents who operate for and on behalf of other agents for a commission.
(iv) Wholesalers who buy produce in bulk and then sell them in smaller packages at a profit.
(v) Retailers; are usually individual small-scale traders who buy the goods from wholesalers and then sell them at a little profit to consumers.
(vi) Co-operative Societies and Unions who handle the marketing on behalf of their members.
(vii) Marketing boards.

24. (a) A parasite is an animal that depends on another animal (host) for food and in some cases, shelter or protection.

(b) (i) They rob host animals of food nutrients, leading to poor health.
(ii) Blood suckers cause anaemia and emaciation.
(iii) Damage to hides and skins lowering their market value.
(iv) Some e.g. roundworms cause blockage in the alimentary canal, leading to constipation and death.
(v) Some e.g. ticks cause irritation and discomfort to host-animals.
(vi) Some are disease vectors.
(vii) Cause abnormal growth in body tissues on which they feed.
(viii) Excrete toxic substances which cause digestive upsets to the hosts.
(ix) Carcasses of host animals killed for meat are usually condemned as unfit for consumption e.g. bladderworms in beef or pork.
(x) They increase costs of production in controlling them or treating infested animals.

(c) (i) External parasites:
. Ticks
. Mites
. Fleas
. Lice
. Keds
(ii) Internal parasites:
. Tapeworms
. Roundworms e.g Ascaris sp.
. Flukes e.g liverfluke.

25. (a) Ecological requirements:
(i) Altitude: Below 1800 m above sea level.
(ii) Temperature: Warm condition and high light intensity.
(iii) Rainfall: Should be evenly distributed rainfall of 1000-1500 mm per annum.
(iv) Soil: Well-drained fertile loam soil with high humus content. Should have a pH of 5-8.

(b) Cultivars:
(i) Cooking cultivars: They are starchy e.g. Bokoboko and Shisikame.
(ii) Dessert cultivars: They are sugarly e.g. Wangae and Shirembe.
(iii) Brewing cultivars: They are either sugarly or starchy e.g. Bokoboko, Kisubi, Muraru.

(c) Land preparation and planting:
(i) Plough the land during the dry season and kill all perenials e.g. couch grass.
(ii) Planting should be done at the beginning of the rains.
(iii) Suckers are planted by covering the roots and white portion of the stem.
(iv) A basin is made around the plant.
(v) Planting holes should be 60 cm. by 60 cm. by 60 cm. spacing - dwarf cultivars 3 m by 3 m while giant should be 4 m. by 4 m.

(d) Field management:
(i) Phosphates are applied during planting time.
(ii) Nitrogen and potassium are required.
(iii) Organic manures can be added during filling of the holes.
(iv) Mulching is necessary to conserve moisture and control soil erosion.

(v) Windbreaks: They prevent strong winds from causing damage.
(vi) Pruning: This is carried out to reduce too many suckers per stool.
(vii) Propping: This is done to support plants with heavy bunches from breaking.
(viii) Weed control: Shallow weeding is done to prevent damage of the roots.

(e) Diseases and their control:
(i) Panama disease: Caused by fungus. Symptoms include yellowing of lower leaves and purple colouration of vascular tissues inside the stem. Control is done by destroying infected materials, sterilisation of implements and planting disease-free materials.
(ii) Cigar end rot: This is caused by fungus. Symptoms include rotting of the tips of the infected fruits. Control is done by removal of dead floral remains from the young tips.

Sample Paper 15

SECTION A (30 marks)

1. (a) An invoice is a voucher issued by the seller to a buyer for goods taken on credit while a delivery note is a document which accompanies the goods delivered.
(b) In current account, money does not receive any interest from the bank but pay charges for the services and money can be withdrawn on demand and payments can be made by cheque while in savings account doesn't pay charges but receives interests from the bank, withdrawals done once a week, no payment by cheque.
2. (i) Easy to mechanise.
(ii) Easy to weed, spray and harvest.
(iii) Correct plant population and appropriate spacing is maintained.
(iv) Optimum quantity of seeds is used.
3. (a) (i) To make them permeable to air and water.
(ii) To remove growth inhibitors.
(iii) To ensure uniform germination.
(iv) Soften the seed coat to enhance faster germination.
(b) (i) Low level of capital investment.
(ii) Use of machinery is uneconomical.
(iii) There is no efficiency in farm operations.
4. (a) It is the artificial application of water to the soil for the purpose of supplying it sufficiently to the crops.
(b) (i) The amount of water available.
(ii) The topography of the land (slope).
(iii) The soil type.
(iv) The type of crop to be grown.
(v) Availability of capital.
(vi) Market of the crop to be grown.
5. (a) (i) For transportation of goods in the farm e.g. farm produce from the farm to the store.
(ii) Compacting silage in a silo.
(b) (i) Lubricate the moving parts of the trailer.
(ii) Check the tyre pressure regularly.

(iii) Replace worn out tyres.
(iv) Check nuts and bolts, if loose tighten them, if worn out replace them.
(v) Should be kept under shade when not in use.
(vi) Paint the outer parts of the trailer.

6. (i) Washing and sterilisation of milking equipment.
(ii) The milker should be clean and free from any infection.
(iii) The cow should be clean and healthy.
(iv) The milking shed should be free from stangnant water, dust, flies, and odours.
(v) Use a strip cup to detect the cows with mastitis. Such cows should be milked last and the milk should be poured.
(vi) Milk should be filtered to remove any foreign matter e.g. cow's hair.
(vii) Cool milk immediately to reduce the rate of bacterial multiplication.
(viii) Keep milk in covered containers, which must be seamless and not coated with copper or iron traces.

7. (i) To keep check on income and expenditure.
(ii) To know which activities are financially worthwhile.
(iii) To obtain knowledge of the total value of the farm.

8. A statutory body is a group of people established by an act of parliament and is charged with the running or managing of an industry.

9. (i) Dairy Board of Kenya.
(ii) Coffee Board of Kenya.
(iii) Pyrethrum Board of Kenya.
(iv) Kenya Tea Development Authority.
(v) National Cereals and Produce Board.
(vi) Kenya Sugar Authority.
(vii) Kenya Meat Commission.
(viii) Cotton Seed and Lint Marketing Board.

10. (i) It establishes very fast due to a lot of vigorous root system.
(ii) It is resistant to disease.

11. (i) Producer and marketing co-operatives.
(ii) Savings and Credit Co-operatives.
(iii) Land-buying Co-operatives.
(iv) Transport Co-operatives.
(v) Housing co-operatives.

12. The possible causes of infertility in cattle:
(i) Damaged or injured uterus due to abortion or infection.
(ii) Blocked fallopian tubes.
(iii) Extreme cases of deficiency of essential nutrients e.g. Vitamin E. in the animals's diet.
(iv) Heifer-calf born twin to a bull-calf is infertile.

SECTION B (30 marks)

13. (a) (i) Metal pipes.
(ii) Plastic pipes.
(iii) Hose pipes.

(b) (i) Extra or additional cost incurred as a result of the change.
(ii) Reduced or saved costs; cost that will no longer be incurred because of the change.
(iii) Extra revenue or added receipts from sale of extra products and services.
(iv) Revenue forgone (reduced receipts), that is returns that will no longer be earned after the change is effected.

14. (i) Removes trash from the soil.
(ii) It smoothens and compacts the top soil by breaking up lumps of soil.
(iii) If the teeth are well set, it can be used for cultivating small plants.

15. (i) For a sustained income throughout the year.
(ii) To avoid total loss in case of pest or disease outbreak.
(iii) To avoid total loss of income due to fluctuations in prices.
(iv) To provide enough work to the labourers in the farm throughout the year.

16. (i) In areas with short vegetation.
(ii) Where advisory services are available.
(iii) Where land size is small.
(iv) Where the shape of the land is irregular.
(v) Where the land is slopy.

17. These are butter, ghee, cheese, cream and yoghurt.

18. Elasticity of supply is the degree of responsiveness of supply to a change in price.

19. (a) Gross margin is part of the total revenue or income that remains after the deduction of variable costs incurred in the production of a given commodity.
(b) Net revenue is the income that remains after all the production costs (variable and fixed) have been deducted from the gross revenue.

20. (a) Net farm income is the income that remains after all costs of production have been deducted from the gross (total) revenue.
(b) Characteristics of fixed (common) costs:
(i) They are not allocable to individual or specific enterprises.
(ii) They are inescapable i.e. once they are committed they must be incurred even if no production takes place.
(iii) They do not change with level of output.
(iv) They are easily deferred or postponed.

21. (i) Regular collection of eggs.
(ii) Making the laying nests dark.
(iii) Provide birds with adequate and balanced feeds.
(iv) Provide enough laying nests.
(v) Remove and discard broken egg-shells.
(vi) Avoid boredom among the birds.
(vii) Debeak perpetual offenders.

22. (i) Participation and competition in A.S.K. Show activities e.g. livestock and farm produce judging.
(ii) Organising and participation in annual Y.F.C. rallies and camps.
(iii) They plant trees.

SECTION C (40 marks)

23. (a) The law of diminishing returns states that if successive units of one input are added to fixed units of other inputs, a point is eventually reached where additional output (yields) per additional unit of input will decline.

Examples:
(i) Use of varying units of labour on a fixed unit of land.
(ii) Feeding dairy cattle with varying units of feed for milk production.
(iii) Using varying units of fertilisers in the production of a given crop.

(b) (i) At the end of the third unit of fertiliser application.
(ii) This is the last profitable point of fertiliser application, when the marginal revenue (Kshs.400) is higher than the marginal cost (Kshs.320).
If the farmer continued to add the fourth unit of fertiliser, he would be at a loss of Kshs.120.
(iii) Net Revenue is highest at the same point (3rd unit) of fertiliser application, at Kshs.12,640.

24. (a) Plant nutrients are elements from the soil and other sources which constitute plant nutrition and sustain plant life.

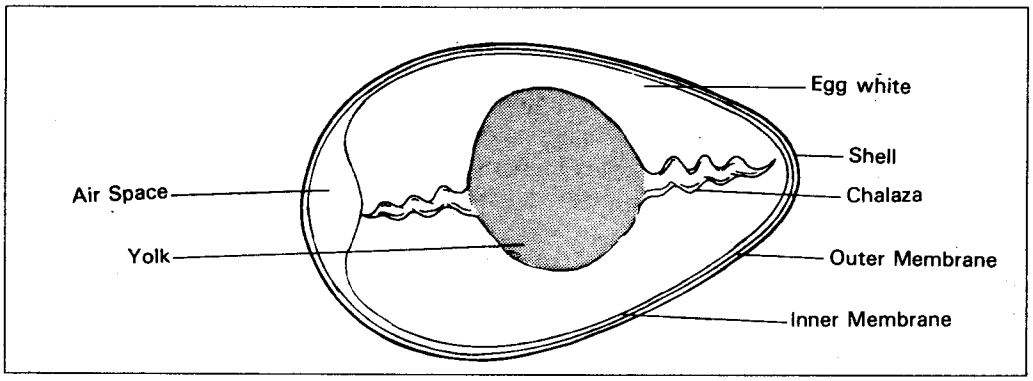
(b) (i) Nitrogen (ii) Phosphorous
(iii) Potassium (iv) Calcium
(v) Magnesium (vi) Sulphur.

(c) (i) Clear the sampling site of vegetation cover.
(ii) Avoid any site with unusual soil conditions.
(iii) Mark the sampling spots using either zigzag or traversing pattern to ensure that composite sample is obtained.
(iv) Using a soil auger or soil tube, make vertical cuts to desired depth and scoop out the soil.
(v) Top soils and sub-soils must be sampled separately and put in separate containers
(vi) Ensure that containers are not contaminated in any way.
(vii) Mix each quantity thoroughly, crushing the large lumps in the process.
(viii) Dry the soils separately in a clean place.
(ix) Take a representative sample from each type of soil separately.
(x) Pack each sample in the prescribed container and properly label them.
(xi) Dispatch the samples to the laboratories.

(d) (i) Prepare the cellophase paste by mixing material with water and stirring.
(ii) Mix the inoculant with skim milk.
(iii) Mix the materials made in (i) and (ii) above.
(iv) Pour the seeds on a concrete floor and onto these pour the mixture obtained in step (iii) and mix thoroughly.
(v) Slowly add lime and mix.
(vi) Spread out the mixture in a shade and leave for about twelve hours to dry.
(vii) Plant the seeds within 48 hours.

25. (a) (i) Egg candling.
(ii) Physical observations (bloom).
(iii) Floating or sinking in water.
(iv) Shaking lightly.

(b)



(c) (i) Shell - Protects the inner part of the egg.
(ii) Albumen - Foood reserve for the developing embryo.
(iii) Chalaza - Holds the yolk at the centre of the egg.
(iv) Yolk - Contains a germ spot which will develop into a chick if fertilised. It also contains food reserves for the developing chick.

Sample Paper 16

SECTION A (30 marks)

1. (a) It is the amount of money paid in exchange for a good or service.
   (b) Gross Domestic Product.
2. (i) Filtration (ii) Chlorination.
3. (i) Surface water (ii) Underground water
   (iii) Rain water.
4. (i) Poor storage facilities hence high losses, wastage and spoilage.
   (ii) Poor means of transport and communication facilities hence perishable produce go bad.
   (iii) Poor handling, e.g packing, packaging, sorting and processing leading to lower prices because of low quality products.
   (iv) Poor prices of agricultural commodities.
   (v) Bulkiness of agricultural products.
   (vi) Lack of market information.
   (vii) Perishability of the agricultural products.
   (viii) Fluctuation of market prices.
5. (a) Prices will fall.
   (b) Prices will rise.
6. (i) Domestic use e.g drinking, cooking and washing purposes.
   (ii) Processing farm produces e.g tea factory, coffee factory, hides and skin industry etc.
   (iii) Cooling the engine i.e in tractor radiator.
   (iv) Diluting agro-chemicals in crops and livestock

(v) Watering livestock, washing animals and farm structures.
(vi) Used an ingredient in concrete mix, mortar mix etc.
(vii) Used for irrigating crops, grass lawns etc.
(viii) Operation of grinding mills.
(ix) Generation of hydro electric power.

7. (i) Demand (ii) Supply
8. (i) To firm the soil slightly or compact the soil gently.
(ii) When planting tiny seeds which should not be buried too deep.
9. (i) Nervousness.
(ii) Restlessness - lying down and rising with high frequency.
(iii) Tendency to isolate from the rest.
(iv) Front of hips are sunken.
(v) Distended udders, swollen vulva with clear mucous discharge.
10. (i) Avoid injuries to others.
(ii) Help cow to share small feed and water space.
11. (a) (i) Wet and muddy conditions.
(ii) Overgrown hooves.
(iii) Physical injuries sustained from sharp objects e.g nail, barbed wires, broken bottles, etc.
(b) (i) Carry out the shearing during a dry or fine weather/season.
(ii) Do the operation on a clean dry floor to avoid fouling the wool.
(iii) Avoid making half-cuts. This damages the staple of the wool.
12. (i) High fertility and regularity in breeding.
(ii) Fast growth and early maturity.
(iii) High milk yields.
(iv) Good health - freedom from diseases and ability to resist infection.
(v) Good mothering ability to avoid cases of disowned kids.

SECTION B (30 marks)

13. (a) (i) Reciprocating mowers (ii) Rotary mowers.
(b) (i) Ensure that the blades are sharp.
(ii) Lubricate the rotating parts.
(iii) Clean and oil unpainted parts before long storage.
(iv) Repair worn out guard for total protection of the user.
(v) Check for loose nuts and bolts and replace or tighten them.
(vi) Clean the mower after each day's work.
(vii) Replace worn-out or broken blades.
14. (a) Drip/trickle irrigation is the use of porous pipe or polythene pipes with tiny perforations for water to drip to the ground thus wetting the soil around the base of the crop. Bottles can also be used.
(b) (i) Less amount of water is used hence economises on the available water.
(ii) Eliminates diseases e.g CBD because it doesn't wet the leaves of the crop.
(iii) Discourages the growth of weeds between the rows.
(iv) High pressure is not necessary for water to flow.
(v) Agro-chemicals e.g. fertilisers and insecticides can be dissolved in and applied with water.
(vi) Can be used even in slopy areas, there is no risks surface run-off.

15. (i) Extra land is required for the grazing of the animals.
(ii) Sickness in animals can delay farm operations.
(iii) Rate of work is slow hence not suitable in large farms.
(iv) It is tedious and laborious to work, two people are required.
(v) Time is wasted in training the animals.
(vi) Cattle raids and predators problem.
(vii) They damage crops especially when used for weeding.

16. A market is a place or situation where commodities and services are purchased or sold while Marketing are the processes done on farm produce from the time it is bought until it reaches consumers e.g. transportation etc.

17. (i) Movable pen (ii) Permanent pen.

18. (i) Inefficient use of energy.
(ii) Leads to destruction of the environment through indiscriminate felling of trees.
(iii) A lot of smoke is produced that pollutes the environment.
(iv) Exhaustible resource of power.

19. Signs of heat in a gilt.
(i) General restlessness.
(ii) Slightly swollen vulva and more reddish than pink in colour.
(iii) Discharge of colourless slimy mucus from the vulva.
(iv) Tendency to mount and accept to be mounted by others.
(v) She stands still when pressure is applied on her back.

20. Types of feeds fed to pigs at different stages of their growth.
(i) Creep feed for piglets at the very early stage of life.
(ii) Sow and weaner ration fed to breeding pigs and weaners.
(iii) Finisher or fastener feed or meal given to fattening pigs before they reach slaughter stage.

21. (i) Site should be on a well drained ground.
(ii) Site should be well protected from direct wind (draughts).
(iii) Site should be well sheltered from strong heat of the sun or rain storm.
(iv) Site should be well protected against predators e.g thieves, cats,dogs etc.

22. (i) Cleanliness of hutches, feeding equipment as well as waterers.
(ii) Disinfection of cages or boxes and water and feed troughs.
(iii) Isolation and prompt treatment of sick rabbits.
(iv) Avoid contamination of feed by rabbit droppings to reduce chances of coccidiosis.

SECTION C (40 marks)

23. (a) (i) Land reform is any action designed to improve the structure of land tenure.
(ii) Increases efficiency of land utilisation and hence increases yields.
(iii) It facilitates better supervision and management of land resources.
(iv) It makes possible the utilisation of land that was previously unused.
(v) Security of land tenure is achieved which acts as an incentive for long term investments.
(vi) Conservation of land and water resources through effective soil erosion control.

(vii) Credit facilities can easily be negotiated after registration and issue of land ownership certificates.

(b) (i) New skills and knowledge are gained.
(ii) Farmers benefit by being taught new farming techniques.
(iii) Brings about change of attitude towards new innovations.
(iv) Better crop varieties and livestock breeds are developed.
(v) Better control of pests and diseases.
(vi) Enable researchers to achieve new technology.
(vii) Correct and appropriate use of fertilisers and agro-chemicals e.g herbicides and pesticides.

(c) (i) Credit is borrowed capital.
(ii) Farmers get access to capital which they could not raise on their own.
(iii) More labour can be put into use by engaging more workers with the acquired capital.
(iv) More land is put into use and hence high production is achieved.
(v) If properly managed, credit enables the borrower to pay back the loan plus interest and remain better off than before.
(vi) Lenders of credit get or earn more capital by charging interest.
(vii) Security is required for one to obtain credit.

24. (i) Provide adequate and balanced feed.
(ii) Avoid overcrowding by providing enough floor space in the premises.
(iii) Provide oyster shells to layers to supply calcium necessary for egg shell formation and to aid digestion.
(iv) Discourage as much as possible sudden changes in routine.
(v) Handle birds gently and avoid scaring or chasing them around.
(vi) Avoid boredom which may encourage bullying.
(vii) Keep off strangers e.g persons or animals like dogs, which are unfamiliar to birds.
(viii) Control pests (parasites) and diseases.
(ix) Eradicate vermins e.g rats in poultry houses.
(x) Avoid extreme temperatures e.g excessive heat or chilling conditions.
(xi) Discourage introduction of new birds which may become targets of bullying by others.
(xii) Discourage anything that may lead to vices - cannibalism and egg eating. This may be done by debeaking the offenders, provision of enough and darkened laying nests and regular collection of eggs.

25. (a) (i) Spread of diseases e.g cholera, typhoid and Bilharzia if water is contaminated.
(ii) Waterlogging of crop plants when there is too much water.
(iii) Soil erosion if land is slopy and bare.
(iv) Flooding which damages crops and human lives.

(b) Water cycle is the circulation of water from the Earth to the atmosphere and back to the Earth.

(c) (i) Evaporation from the surface of water bodies and transpiration from plant surfaces by solar energy.
(ii) Water vapour rises into the atmosphere.
(iii) Water vapour in the atmosphere cools and condenses to form clouds.
(iv) Heavy clouds fall down in form of precipitation.
(v) Precipitation reaches the ground surface in form of water.
(vi) Water enters water bodies and is also taken by plants.

Sample Paper 17

SECTION A (30 marks)

1. (a) Falls
   (b) Rises.
2. (a) It is the preparation of the soil through cultivation for planting.
   (b) (i) Mouldboard plough.
   (ii) Disc plough.
   (iii) Chisel plough.
   (iv) Subsoiler.
   (v) Rotavator.
3. (a) (i) Row crop planter.
   (ii) Seed drill.
   (b) (i) Dig furrows to the required depth and spacing.
   (ii) Deposit the seeds in the furrow.
   (iii) Deposit fertiliser in the furrow.
   (iv) Cover the seeds.
4. Rollers.
5. (i) Fan (ii) Solid cone (iii) Hollow cone
6. To atomise the spray into fine droplets.
7. It is used for killing animals in the slaughter house.
8. (a) (i) Transportation of farm produce e.g. from farm to store or to market points.
   (ii) Pulling ox-plough during cultivation.
   (b) (i) Amount of luggage or load to be carried (do not overload).
   (ii) Even distribution of load-weight over the back and shoulders.
   (iii) Use of straps with some cushioning and not just ropes which can injure the animal.
   (iv) Carts or other equipment pulled should have a means of controlling their movement and/or keeping stationary where necessary.
9. Irish potato or tomato vines contain an alkaloid called solanine, which is highly poisonous to rabbits.
10. Camels are suited to working in arid or semi-arid areas because:
   (i) They can tolerate high temperatures in such areas.
   (ii) Camels can browse on poor vegetation and survive on it quite well.
   (iii) They can travel for long distances in such areas and for several days with very little water.
   (iv) Their hooves are well-equipped with hardy pads which enable the animals to traverse large areas of sandy ground.
11. Roles of the three different members of a bee colony.
   (i) The queen is a fertile female that breeds to ensure continuity of the species.
   (ii) Drones are fertile males that mate with and fertilise the queen.
   (iii) Workers are sterile females who maintain the colony by feeding and caring for the queen, drones and the young by collecting nectar for honey-making as well as protecting the hive.
12. Lamb crop refers to the number of lambs born and reared to weaning, per annum.

SECTION B (30 marks)

13. (a) (i) Wear plates counteract upward and downward forces thus holding the knife in position.
(ii) Swath board determines the cut area.
(b) Through the power take-off shaft of the tractor.
14. (i) Notches do slashing and cutting of the trash.
(ii) Blades penetrate deeply and turn the soil.
15. (i) Collects trash.
(ii) Levels the ground.
(iii) Breaks the soil clods by means of vibrating effect of the tines.
16. Profit and loss account is a financial statement which shows purchases and receipts made during the accounting period (one year) while balance sheet shows assets and liabilities at a particular date.
17. (i) Requires less labour.
(ii) There is no disturbance to the roots of crops.
(iii) Efficient in very wet or very dry conditions.
(iv) Does not disturb soil structure.
(v) Less tiring to the user.
(vi) There is timeliness in operation.
18. (i) Soil condition.
(ii) Topography.
(iii) Adjustment of the plough.
(iv) Depth and rate of ploughing.
(v) Sharpness of the share/discs.
19. (i) Ensure water does not enter the hive.
(ii) Replace worn-out parts.
(iii) Use wood preservative on the outside of the hive to prevent rotting.
20. (i) Avoid excessive smoking of the hive during honey-extraction.
(ii) Prevent rain-water from getting into the bee hive.
(iii) Use clean equipment to extract and keep the honey to avoid contamination.
(iv) Use protective clothing to prevent bee stings.
21. (i) Should be sited on fairly level ground.
(ii) Must be near or easily connected to a permanent source of water.
(iii) Walls and floor should preferably have clay lining to avoid undue seepage of water.
(iv) Fish-pond water must be free from any pollutions e.g. chemicals.
22. (i) Type of flowers from which nectar is collected.
(ii) Method of harvesting and extraction.
(iii) Stage of maturity of honey.
(iv) Season of the year.
(v) Type of containers used.

SECTION C (40 marks)

23. (a) (i) It is putting together scattered pieces of land.
(ii) It improves the efficiency with which land is operated.
(iii) It improves conservation of land resources (soil and water).
(iv) It facilitates mechanisation of farm enterprises operations.

(v) It improves efficiency of labour use through better supervision and hence increases production.
(vi) Security of tenure creates the incentive to invest more and increase productivity.
(vii) Facilitates agricultural advice to farmers.
(viii) Helps in sound farm planning and adoption of crop rotation programmes.
(ix) Facilitates effective control of pests and diseases of crops and animals.
(x) Saves time spent in travelling from one pasture to the other.

(b) (i) Availability of enough funds or capital.
(ii) Training of personnel or availability of advisory services on management skills.
(iii) Honesty on the part of personnel with regard to the handling of co-operative finances.
(iv) Efficiency with which produce from farms are marketed.
(v) Proper and accurate record-keeping and accountability of all operations.
(vi) Loyalty on the part of all the farmers, co-operators, officials etc. to support their organisations.

(c) (i) Input-rationing.
(ii) Diversification of enterprises.
(iii) Flexibility in organization and production methods.
(iv) Selecting more certain enterprises.
(v) Transfer of risks to specialist risk-bearers.
(vi) Liquidity in investment.

24. (a) Gross margin = Gross output - variable cost.
32 x sh.85.00 - sh.1503.00.
= sh.1217 per hectare.

(b) Because of the following reasons:
(i) Price fluctuations.
(ii) New Innovations.
(iii) Changes in climate and other conditions.
(iv) Need for better utilisation of resources.

(c) (i) Family labour
(ii) Hired labour.

(d) Man-day or man-hours.

25. (a) (i) Bursting up the subsoil.
(ii) Improving drainage.
(iii) Aerating the soil.
(iv) Pulling up deep-rooted weeds.

(b) Disc plough.

(c) (i) Beam (frame). (ii) Standard
(iii) Hub (iv) Disc blade
(v) Scraper

(d) (i) To remove trash.
(ii) To remove the soil or mud from the surface of the discs.

(e) To cut furrow slices and invert them.

(f) (i) Where there are obstacles e.g. stumps and stones.
(ii) Where a new land is to be opened.
(iii) Where there are a lot of surface vegetation or trash.

Sample Paper 18

SECTION A (30 marks)

1. (i) Human power
   (ii) Animal power
   (iii) Oil fuel power
   (iv) Solar energy
   (v) Biogas power
   (vi) Wind power
   (vii) Water power
   (viii) Electricity
   (ix) Wood or charcoal fuel power
   (x) Nuclear energy.
2. (i) Price the commodity.
   (ii) Taste and preference of the consumers.
   (iii) Price of substitute commodities.
   (iv) Level of income of consumers.
   (v) New inventions.
   (vi) Price expectation.
   (vii) Rise in population.
3.

Disc plough:	Mouldboard plough:
(i) Can be used on land with obstacles e.g. stumps	(i) Cannot be used on land with obstacles
(ii) Leaves a rough seedbed	(ii) Inverts the furrow slices completely leaving a clean field.
(iii) More secondary cultivations are required	(iii) Fewer secondary cultivations are required.
(iv) Cuts at varying depths	(iv) Operates at uniform depth.
(v) Requires less power to pull	(v) Requires more power to pull.

4. Rotavator.
5. (a) Disc plough.
   (b) (i) It rolls over obstacles hence rides over stones etc.
   (ii) Because of the rotary motion of the discs blades, it requires less power to pull.
   (iii) Doesn't require frequent replacement of parts.
   (iv) Does a better job in sticky or heavy clay soils.
6. Equilibrium price.
7. (i) Throws herself on her side.
   (ii) Becomes restless.
   (iii) Its vulva becomes swollen.
   (iv) Rolls herself against objects e.g. walls or container.
   (v) Tries to contact the rabbit in the next hutch.
8. (i) Anthrax.
   (ii) Black quarter.
   (iii) Blue tongue.
   (iv) Brucellosis.
   (v) Foot and Mouth disease.
   (vi) Entero-toxaemia.
   (vii) Lamb dysentery.
9. (i) Elastrator (Rubber-ring) method.
   (ii) Burdizzo method.
   (iii) Knife or open method.
10. (i) Avoids bullying among the animals.

(ii) Easy keeping of management records.
(iii) Proper and effective feeding/adequate and economical use of feeds.
(iv) Operations e.g. vaccination, drenching, etc, are easily carried out at any one time.

11. Considerations made when planning the construction of a grain store:
(i) Must be sited on a well-drained ground.
(ii) Free ventilation without draughts.
(iii) Must be rain-proof or leak-proof.
(iv) Must provide adequate floor-space.
(v) Must be easy to clean.
(vi) Must be pest-proof e.g. rats.
(vii) Must be theft-proof.

12. (i) Used as human food.
(ii) Used in brewing of beer.
(iii) Stalks are used for livestock feeding.

SECTION B (30 marks)

13. Because when the blades hit an obstruction they can swing backwards hence reduces the damage on the blades.

14. (i) Increase the size of tuber.
(ii) Ease of harvesting.
(iii) Facilitate drainage.

15. (a) (i) Brown sports with grey centres on the leaves.
(ii) The heads fall over and are empty.
(b) Planting resistant varieties.

16. (a) Share penetrates into the ground and cuts off the furrow slice.
(b) Frog is the part on the mouldboard where the share, landside and mouldboard are attached.
(c) Provides points of attachment for support of other parts of the plough.

17. Drawbar.

18. (i) Planting clean or healthy suckers.
(ii) Dipping planting suckers in a solution of dieldrin before planting.
(iii) Sprinkle dieldrin around the basis of the stems.
(iv) Avoid mulching close to the stool.
(v) Restriction of movement of affected materials.

19. (i) Control of stocking rate.
(ii) Harvest fish at their correct maturity stage.
(iii) Avoid water pollution by chemicals or other impurities.
(iv) Maintain appropriate depth (level) of water in the pond.
(v) Ensure adequate and correct supply of food.
(vi) Control predators and thieves.
(vii) Drain and replace pond waters as appropriate.

20. (a) Land tenure is the ownership of the rights to the use of land.
(b) (i) Lack of incentives among users to conserve land resources (soil and water).
(ii) Tendency to overstock and practise continuous cropping may lead to soil erosion and reduced productivity of land.

(iii) It is impossible to improve livestock due to communal grazing and uncontrolled breeding.
(iv) It is impossible to secure loans for improvement, due to lack of legal ownership by individuals.

21. Possible disadvantages of owner-operator of systems of land tenure:
(a) Operation costs e.g. of machinery services may be too high for an individual owner.
(b) Investments and innovations may be inadequate due to lack of enough capital and low level of education.
(c) Lack of enough capital to invest and hence low levels of income.

22. Benefits of tenancy to a tenant:
(a) A tenant can rent a larger hectarage of land than he can own.
(b) The system is flexible and allows room for change of production plans i.e. a tenant may increase or reduce his level of production.
(c) Security of tenure and length of lease encourages the tenant to invest more and increase his income in the long run than e.g. under communal or co-operative systems.

SECTION C (40 marks)

23. (a) A co-operative is an organisation of people, with common aims, who pool their resources together to market or purchase agricultural commodities and other services.
(b) (i) Collection and assembling of members' produce at convenient points.
(ii) Processing and/or treatment of such produce.
(iii) Transportation of members' produce to market or storage points.
(iv) Storage of such produce when and where need arises.
(v) Negotiating fair prices with purchasing agencies, for their members produce.
(vi) Purchase and distribution, to members, of farm inputs.
(vii) Training and education of members on improved farming techniques.
(viii) Provision of farm machinery services on hire-purchase terms.
(ix) Co-operatives may invest in other viable undertakings and members' benefit from dividends and bonuses.
(c) (i) Financial mismanagement due to poor accounting.
(ii) Corruption and misuse of co-operative resources by the personnel.
(iii) Lack of advisory services on technical operations.
(iv) Inability to honour their objective of advancing members credit facilities due to malpractice.
(v) Bulkiness of agricultural produce and hence difficulties of storage.
(vi) Transportation problems due to poor roads and breakdowns of vehicles.
(vii) High perishability of produce and hence difficulty to sustain quality for long.

24. (a) Mouldboard:
(i) Depth - landwheel/Hydraulics system.
(ii) Pitch - altering the length of the top link between the tractor and the plough.
Disc plough:
(i) Depth - Depth wheel/Hydraulic system.
(ii) Width of Cut - move the disc plough to the right or left on the drawbar using the chain.
(b) (i) Double mouldboards -make ridges or furrows
(ii) Share - cuts the furrow slice.

(iii) Beam/framework -supports the other parts and adds weight.
(iv) Three point linkage - To connect on to the tractor.

(c) (i) Replace the worn out share.
(ii) Apply old Engine oil on the mouldboard before storage.
(iii) Clean the equipment after use to remove soil particles.
(iv) Replace worn out bolts and nuts.
(v) Paint the parts which require painting e.g. the frame.
(vi) Keep it under shade during off season.

25. (a) Coffee is propagated by seeds obtained from selected high-yielding and disease-resistant parent plants, and a high degree of uniformity.

(b) Coffee requires the following ecological conditions for optimum performance:
(i) Rainfall: An average of 750-1000mm per annum, well-distributed.
(ii) Temperatures: Is usually determined by altitude average of 30°C.
(iii) Altitude: Ranges between 1400 m. to 2000 m. above sea-level.
(iv) Light: Coffee is sensitive to bright light and would prefer cloudy conditions and planting of shade trees.
(v) Soils: Well-drained medium loam soils with a depth of two metres. They should also be fertile with high content of potassium, calcium and magnesium.

(c) Land preparation:
(i) Nursery.
- Should be on flat or gently-sloping site with permanent source of water.
- Dig out tree stumps and roots from the sitte.
- Eradicate weeds particularly couch grass.
- Cultivate the seedbed to a fairly fine tilth.
- Prepare nursery beds of convenient sizes. (usually 1 metre wide and a suitable length).

(ii) Field.
Prepare the field six months before planting is due. Apart from removing tree stumps and roots, pay special attention to complete eradication of grass weeds. Such grasses are usually difficult to get rid of later. Planting holes are dug three months before planting at a spacing of 2.7 metres by 2.7 metres. These holes should be 60 cm. deep and 60 cm. in diameter.

(d) Pest Control:
There are two pest of economic importance in coffee:
(i) *Antestia bugs.* There are sucking bugs. Apart from sucking plant sap they introduce, through their mouth-parts a fungus -nematospora- which causes zebra stripes on the parchment and soft beans, thus lower beans quality.
Control:
Open pruning to destroy breeding places.
Spraying with insecticides.
(ii) *Leafminers.* Feed on leaf-tissues, making serpentine mines and thus reducing the photosynthetic area of the leaves which eventually fall off.
Control:
Spraying with insecticides e.g. parathon and other recommended chemicals.

Sample Paper 19

SECTION A (30 marks)

1. Cherry is the ripe berry which has been picked but not pulped while parchment is the pulped bean.
2. (i) Top link is the part which provides a point of attachment between the tractor and the implement. It is used for levelling the plough when digging to be parallel to the ground level.
   (ii) Check chains helps the two side links to prevent the side-swaying of the implement when digging.
3. (a) Castration is the removal of the testicles in male livestock or stoppage of production of spermatozoa or semen. It is the rendering of male reproductive organs non-functional.
   (b) (i) Controls breeding.
   (ii) For easy management since animals are made docile and less aggressive.
   (iii) Prevent breeding diseases.
   (iv) Can be done as a remedy for tumours, injuries and scrotal hernia.
   (c) (i) Elastrator and rubber ring.
   (ii) Knife Scalpel.
   (iii) Burdizzo.
   (iv) Emasculator.
4. (i) Through the umbilical cord.
   (ii) Through the respiratory tract.
   (iii) Through the mouth
5. (i) By soil analysis or testing.
   (ii) By plant part analysis.
   (iii) Observing deficiency symptoms on crops.
6. (i) Through soil erosion.
   (ii) Through leaching.
   (iii) Used up by growing plants.
   (iv) Through volatilisation.
   (v) Can be used by micro-organism.
   (vi) Through denitrification.
7. The practice of planting different crops in strips or bands alternately on the same piece of land at the same time.
8. (i) Proper harnessing.
   (ii) Foot care - and hoof-trimming when necessary.
   (iii) Adequate feeding and rest after the day's work.
9. Factors considered when selecting rabbits for breeding:
   (i) Good body size and shape.
   (ii) Performance in terms of breeding efficiency and growth rate.
   (iii) Good health - freedom from diseases and physical deformities.
10. (i) Seeds do not breed true-to-type.
    (ii) Some seeds have long dormancy periods.
    (iii) Seeds are delicate and can spread undesirable genes.
11. Factors that would necessitate the sub-division of land into smaller pieces:

(i) When one wants to sell part of the land.
(ii) When one wants to subdivide his land among his children.
(iii) When the government wants to settle landless people.
(iv) When land owned by co-operatives is divided among the shareholders.

12. (i) Moisture content of the soil.
(ii) Size of the seed.

SECTION B (30 marks)

13. (i) Use or purpose of the crop.
(ii) Tastes and preferences of consumers.
(iii) Keeping quality of the produce.
(iv) Moisture content of the crop particularly in cereals.

14. (i) Kind, size and amount of aggregate used.
(ii) Amount of clean water used.
(iii) Mixture of ingredients and handling
(iv) Curing of the mixture.

15. Transmit power from the tractor engine to the implement being operated.
16. 100 birds.
17. (i) Maize weevils.
(ii) Rats and mice.
18. (i) More birds can be kept in a given area.
(ii) Better protection of birds from predators.
(iii) Maximum loss of eggs.
(iv) Fast accumulation of manure.
19. (a) The occupation of land which was previously uninhabited, for whatever reason.
(b) Main objectives of land settlement programmes in Kenya.
(i) To settle landless citizens.
(ii) To relieve or ease populated pressure.
(iii) To increase agricultural productivity by farming on land that was previously unused.
(iv) To improve people's standards of living through creation of employment and source of income.

20. (i) To improve the standards of living of the household members by paying for their essential needs.
(ii) To expand and/or build more industries to create more employment.
(iii) To finance government projects through taxes to further national development.

21. A factor of production is anything that contributes directly to output (yields).
22. (a) Scarcity of resources means that the productive resource are limited in supply relative to people's demand for them.
(b) (i) They feed at the same level and have similar nutrient requirements.
(ii) Both are attacked by similar soil pests.

SECTION C (40 marks)

23. (a) (i) Increased food production to feed the increasing population.
(ii) Improved land use through extensive and intensive farming.
(iii) Have made better and effective use of agricultural extension services.

(iv) Have created employment opportunities to many Kenyans.
(v) Have increased and made better use of agricultural credit facilities.
(vi) Have encouraged and improved marketing co-operatives
(vii) Have encouraged and increased commercial farming by introducing farming communities to cash economy.
(viii) Have made available to farmers improved livestock and crop production techniques.
(ix) Have developed better infrastructural facilities.

(b) (i) Lack of previous farming experience on the part of most settlers led to declined production.
(ii) Inadequate training and advisory services to educate settlers on the improved farming methods.
(iii) Farming systems adopted in most parts were unsuitable to the type of land and climate e.g. growing maize and other food crops in areas that were totally unsuitable for these crops.
(iv) Lack of enough working capital to enable settlers to purchase farm inputs.
(v) Ignorant use of modern farming techniques and use of poor or inappropriate tools led to lowered production.
(vi) The initial capital advanced to the settlers by the Government through the settlement Fund Trustee could not be repaid and could therefore not be circulated to other settlers.
(vii) Traditional practices were carried to settlement schemes.

24. (a) (i) Provide heat in the brooder by regulating temperature as follows:
First week; 35-32°C, second week; 32-29°C, third week; 29-26°C and at the end of fifth week discontinue heating altogether.
(ii) Protect chicks from vermins and predators.
(iii) Maintain the brooder clean and sanitary.
(iv) Provide enough space to avoid overcrowding i.e. from first to fourth week provide 1 m^2 for 20 chicks and from fifth to eighth week provide 1 m^2 for 10 chicks.
(v) Provide dim light in the brooder at night to discourage toe-pecking.
(vi) Provide adequate ventilation without creating draught in the brooder.
(vii) Provide chicks with chick mash as much as they can take and fresh cool water daily upto eighth week.
(viii) Ensure that the litter used is free from dirt and is always dry.
(ix) Vaccinate the chicks as follows:
- At 1 day old - against mareck disease.
- At 5 weeks old - against fowlpox.
- At 7-8 weeks old - against newcastle disease.

(b) (i) Get a cardboard or carton box of a suitable size.
(ii) Make a hole on one side of the box of the same size of an average size egg.
(iii) Place a source of light (torch or electric bulb) in the box and shine it towards the hole.
(iv) Put the egg to be examined over the hole and observe it against the source of light.
(v) If the egg is fertilised blood veins will be seen, if not the egg appears clear.

(c) (i) Combs and wattles are small, dry and pale red.
(ii) Eyes are dull and yellowish.

(iii) Beaks and shanks are yellowish.
(iv) Abdomen is small and hard to touch.
(v) Space between the keelbone and the pelvic bones is narrow.
(vi) Feathers are smooth and glossy.
(vii) Vents are dry, small or shrunken.

25. (a) Land preparation:
(i) Clear the land, cutting down any previous vegetation.
(ii) Dig out any stumps and remove all roots of previous plants.
(iii) Cultivate the land, paying special attention to eradication of grass weeds and particularly couch grass.
(iv) Refine seedbed by harrowing to the required tilth depending on the physical conditions of the soil.

(b) Planting:
(i) Plant early - just before or at onset of rains, depending on the rainfall pattern and planting season of the area.
(ii) Plant at spacing of 30 cm. x 60-75 cm. which gives a plant population of about 40,000 plants per hectare. Use a seed rate of 9-14kg. per hectare.
(iii) Depth of planting is 2.5-5.0 cm. depending on soil moisture.
(iv) Fertiliser application:
- At planting time apply 100-150 kg./Ha. of double superphospate or 200 kg./Ha. of N.P.K. 20:20:0.
- Top-dress with 200 kg./Ha. of ammonium sulphate or calcium ammonium nitrate. When plants are about 45-60 cm. high.

(c) Pest control:
(i) Maize stalk-borer: Field pest whose caterpillars feed on the leaves, stems and the young cobs, causing serious damage and sometimes death of the whole plant.

Control:
- Remove and destroy the affected plants.
- Burn crop residues after the crop is harvested.
- Apply pesticides e.g. endosulfan, diazinon or malathion dust down the funnel before flowering stage.
- Early planting.

(ii) Maize weevil: This is a storage pest although its infestation may start in the field before harvesting. The weevils bore into, and feed on the contents of the grains, seriously lowering the quality in the process.

Control:
- Thorough cleaning of the stores and burning the sweepings before storage of the crop.
- Adequate drying before storage.
- Use of appropriate insecticidal dust e.g. endosulfan or B.H.C. in the stores after thorough cleaning.

(d) Harvesting:
(i) Maize is ready for harvesting 6-12 months after planting. This depends on variety and attitude.
(ii) Harvest when grains have a moisture content of about 18%.
(iii) Harvesting is done either manually by removing the cobs by hand or by use of the maize combine harvesters.
(iv) Alternatively, the stalks may be cut from the field, stooked for further drying

Sample Paper 20

SECTION A (30 marks)

1. (a) (i) Very durable.
   (ii) Cannot be attacked by insects and fungus.
   (iii) Easy to make.
   (iv) Locally available materials (where clay is common).
   (v) Sanitary.
2. Lack of Iron.
3. (i) Cost of production.
   (ii) Government policy.
   (iii) Price expectations.
   (iv) Weather conditions.
   (v) Techniques of production.
   (vi) Price of commodity.
4. Cash book is a book in which all transactions involving receiving and paying out of cash are recorded while a ledger is the principal book of accounts in which the entries contained in all the other books are entered.
5. A journal is a daily book which contains a record of each day's transactions.
6. (a) • Spraying insecticides in the breeding places.
   • Trapping and killing.
   • Clearing of the vegetation.
   (b) • Draining swampy areas.
   • Providing water to livestock in elevated troughs.
   • Fencing the flood plains or near the river banks to prevent livestock from grazing on them.
   • Use of copper sulphate in the marshy areas.
   • Use of antihelminths like Nilzan etc.
7. Opportunity Cost.
8. (a) Marginal cost is the additional or extra expenditure resulting from unit change in output.
   OR
   Marginal cost is the cost incurred in producing the last (extra or additional) unit of output in a production process.
   (b) A farmer maximises profit in his farm operations when:
   (i) Marginal Revenue (MR) is equal to or higher than the Marginal Cost (MC)
   OR
   (ii) Net Revenue (NR) is at its highest.
9. Individual owner-operator (occupier) is a system in which an individual person owns as well as operates land. Landlordism on the other hand is a system of tenure in which the owner of the land (or property) leases the operation of that land to another individual tenant.
10. (i) Used in the manufacture of beer in brewing industries.
    (ii) Used as livestock feed.
    (iii) Used in manufacture of baby food.
11. Flushing is giving high quality feed to ewes before mating while steaming up is giving of high quality feed to pregnant ewe two months before lambing.

12. (a) (i) Blockage of nozzles and filters leading to uneven or no release of spray.
(ii) Control pump may slacken or loosen, making it difficult to regulate the rate of spraying.
(iii) Inadequate operating pressure due to leakages in the compressor pump, hoses or control valves.

(b) (i) Type of planting materials.
(ii) Size of the seed to be planted.
(iii) Type of soil.
(iv) Initial condition of the field e.g. type of vegetation cover.
(v) Time available before planting.
(vi) Tools and equipment used in the operations.
(vii) Cost involved in the operations.
(viii) Moisture content of the soil.
(ix) Liability to soil erosion.

SECTION B (30 marks)

13. (a) Marginal revenue is the extra income obtained from the sale of additional unit of output while marginal cost is the extra cost incurred in the production of an additional unit of output.

(b) A receipt is a document issued when payment for goods delivered or services rendered is made while a statement is a document which is sent by the seller to the buyer to show list of invoices, amount due, total value of money owing during that month etc.

14. (i) Poor ventilation or lack of enough oxygen.
(ii) Age of the animal.
(iii) Dampness and chilliness.
(iv) Overcrowding.

15. (i) Can tolerate high temperatures.
(ii) High butter fat content.
(iii) Small in size hence less amount of food.
(iv) Can utilise poor pastures.

16. (i) Avoids overgrazing hence controls soil erosion.
(ii) Maximisation of available pastures.
(iii) Prolongs the livespan of the pastures.
(iv) Maintains good health in animals. Animals are adequately fed.

17. Adjusting the level of the ploughs for uniform depth of digging.

18. (i) Overgrazing and removal of vegetation cover.
(ii) Continuous cropping.
(iii) Monocropping.
(iv) Continuous use of acidic fertiliser which alters the pH of the soil.

19. Steaming up is the practice of feeding of pigs (sows) with extra nutritive feeds six to eight weeks before they are expected to farrow.
It helps the cow to:
- Build up body reserve for her own maintenance.
- Take care of the developing foetus.
- Prepare for milk production.

20. (a) Hampshire - Mutton (meat) production.
(b) Corriedale - Mutton and wool (dual purpose).

21. (i) Milk production records.

(ii) Breeding records.
(iii) Calf-rearing records.
(iv) Feed records.
(v) Health records.

22. (i) If kept for a long time, they give a history of the farm.
(ii) It helps in farm planning and budgeting.
(iii) Used for fair income tax assessment to avoid over-taxing.
(iv) It makes valuation of the farm easy.
(v) It is a requirement by any loaning institution when a farmer applies for a loan.

SECTION C (40 marks)

23. (a) Agricultural credit is borrowed capital resources to be invested in agricultural projects.

(b) (i) Personal savings or earnings, including sales of farm produce by the farmer.
(ii) Inherited property or assets.
(iii) Donations from well-wishers and charitable organisations.
(iv) Lending agencies e.g.
- Agricultural Finance Corporation.
- Commercial banks.
- Co-operatives.
- Crop Marketing Boards.
- Private Money Lenders.

(c) (i) Crop failure or loss of animals through death.
(ii) Inability to earn income due to marketing problems e.g price fluctuations or failure to get produce to market points.
(iii) Misappropriation of the loan resources by borrowers, so that in the end no investment is made.
(iv) Ambition on the part of the farmers who borrow more than they can repay within the specified time as stipulated by the lenders.

(d) (i) Short-term credit: Is a credit for seasonal purchasing of seeds, fertilisers, agro-chemicals e.g. pesticides, livestock feeds, fuel, etc.
(ii) Medium-term credit: Is used to finance projects whose returns can be realised in two to five years (and repaid within the same period) e.g.livestock, farm tools and equipment, fencing materials, light machinery, etc.
(iii) Long-term credit: This is repayable within a period of up to 15 years or more. It is meant to finance long lasting projects e.g. purchase of land, buildings, irrigation structures, establishment of perennial tree-crops e.g coffee, etc.

24. (a) A crop pest is any organism that destroys or is a nuisance to crops; either directly by feeding on them or by introducing disease agents.

(b) (i) Insects e.g. aphids, locusts, armyworms, beetles, termites, weevils, stainerbug, antestia, maize stalkborers, etc.
(ii) Mites e.g. red and yellow spider mites, pyrethrum mites, etc.
(iii) Nematodes e.g eelworms.
(iv) Rodents e.g. rats, mice, squirrels, moles, etc.
(v) Birds e.g weaverbird, mousebird, sudan dioch (*quelea quelea aethiopica*).

(c) (i) To be able to estimate the rate of multiplication and hence its population at any one time.
(ii) To be able to predict possible attack and estimate the amount of damage.

(iii) To know the relationship between the various types of weather and various stages of pest development.
(iv) To know the most destructive stage of the pest development.
(v) To determine the best stage at which to control it i.e. when it is more susceptible to control measures.
(vi) To decide the most effective method of control.

(d) (i) By use of chemicals e.g. pesticides.
(ii) By early planting of crops.
(iii) By field hygiene e.g. destruction of affected crop residues.
(iv) By use of trap crops.
(v) By practising close season, crop rotation and by growing resistant varieties.
(vi) By trapping and killing pests.

25. (a) (i) They feed on and destroy liver tissues causing the liver disease called fasciolyasis.
(ii) They cause loss of condition and emaciation.
(iii) They destroy red blood cells causing anaemia.
(iv) Affected animals do not feed adequately and hence production declines.
(v) The hardened condition of the liver interferes with blood circulation.

(b) **Anaplasmosis:**

(i) Cause:
A protozoan organism of the genus Anaplasma marginale.

(ii) Clinical signs:
- Anaemia and jaundice.
- High fever and general weakness.
- Loss of appetite and hence emaciation.
- Abortion in pregnant animals.
- When the carcass is opened, blood is thin and watery.
- Liver, spleen and kidneys are enlarged and yellowish.
- Presence of anaplasma organism in blood-smear on slide.

(iii) Control/Preventive measures:
Effective control or eradication of ticks.

Contagious abortion:

(i) Cause:
Bacterium *(Brucella ssp.)*

(ii) Clinical signs:
- Abortion occurs after five months of pregnancy.
- Brownish discharge from the uterus following abortion.
- Affected animals usually do not conceive again.
- Examination of the lung and stomach contents of the aborted foetus reveal the presence of brucella pathogens.

Control/Preventive measures:
- Vaccination of heifers between six and nine months old.
- Proper disposal of aborted foetuses.
- Sterilisation of contaminated spots.
- Milk from suspected animals should be boiled before it is consumed by human and other animals.
- Suspected animals should be separated during parturition to minimise spread of pathogens.