30.14 AGRICULTURE (443)

30.14.1 Agriculture Paper 1 (443/1)

1.
- Small size of land.
- Limited capital.
- Simple/limited tools/or implement.
- Less labour required.
- Maximizes labour available. ***(2 x ½ = 1 mark)***

2.
- Shortage of farm labour due to bad health/death.
- Low supply of farm produce due to loss of market.
- Low purchasing power to buy agricultural input/lack of capital by the government and NGOs to provide credit to farmers.
- Lack of motivation to invest in agriculture.
- Less time spent on farming activities as people cater for the sick. ***(2 x ½ = 1 mark)***

3.
- Environmental friendly/no pollution.
- It is sustainable/conserves soil.
- It is easily carried out.
- The produce fetch higher prices in the international market/higher demand in the international market of the produce.
- Materials used are easily available/cheaper.
- Produce healthy products. ***(2 x ½ = 1 mark)***

4. ***Soil structure*** is the physical arrangement of soil particles and how they adhere to each other to form an aggregate where as ***soil texture*** is the relative proportion of various sizes of mineral particles in the soil.
(1 mark)

5.
- Causes water pollution.
- Interferes with hydroelectric power generation.
- Leads to decline in fish production in dams.
- Reduction of water volume. ***(2 x ½ = 1 mark)***

6.
- Fertilizers.

- Seeds.
- Fuel.
- Pesticides. ***(2 x ½ = 1 mark)***

7. (a) Specific integrated action/programme to bring about more effective control and use of land/an organized action taken to improve the structure of land tenure and land use.

(½ mark)

(b)
- Land tenure reforms/land ownership.
- Land consolidation.
- Land sub-division/demarcation.
- Land adjudication and registration.
- Resettlement. ***(3 x ½ = 1½ marks)***

8.
- Addition of organic matter/organic manure.
- Application of fertilizers/soil amendments.
- Irrigation.
- Drainage.
- Control of weeds/soil bone pests and diseases.
- Carrying out soil and water conservation. ***(3 x ½ = 1½ marks)***

9.
- Marketing of coffee/market research and advertisement, pricing, storage and transport of parchment.
- Offering advisory services to the coffee industry/Ministry of Agriculutre.
- Financing coffee research.
- Licencing coffee farmers, millers, dealers and pulpers. ***(3 x ½ = 1½ marks)***

10. (a)
- ***Fixed input*** is a resource factor of production in which the quantities required do not vary or change with the level of production (for example:- permanent labour, tractor, breed of livestock), whereas ***variable input*** is a resource factor of production in which the quantities required vary or change with the level of production (for example:- seeds, livestock feeds, casual labour, chemicals) .

(1 mark)

(b)
- ***Journal*** is a financial book in which daily farm transactions are entered or recorded as

they occur, while ***Ledger book*** is a book of account in which the entries contained in all the other books of accounts are entered or recorded. ***(1 mark)***

11.

- Hot water treatment.
- Mechanical/chemical scarification.
- Light burning of seeds with hard seed coat.
- Mechanical removal of wings.
- Soaking in water.
- Dressing seeds against pests/diseases.
- Seed. ***(2 x ½ = 1 mark)***

12.

- Acts as a windbreak/controls soil erosion.
- Marks the boundaries in farms.
- May act as a live fence.
- May provide wood fuel, timber, fodder, composting material, fruits.
- Adds beauty/aesthetic value.
- Adds value to the farm. ***(2 x ½) = 1 mark)***

13.

- Stage at which the grass /standing hay is cut/harvested.
- Efficiency in preparation/how well the grass is dried/turned.
- Storage conditions.
- Species of crop used in making hay.
- Length of drying period.
- Prevailing weather conditions during drying period. ***(3 x ½ = 1½ marks)***

14.

- Source of water.
- Nearness to the field.
- Type of soil.
- Distance from forest/bush/shelter.
- Previous cropping.
- Security.
- Accessibility.
- Topography/slope.
- Direction of prevailing wind. ***(4 x ½ = 2 marks)***

15.

- Physically destroying the insect pests.
- Spraying seedlings with appropriate insecticides.
- Roguing/uprooting affected seedlings.
- Fumigating the nursery before planting.
- Seed dressing/use of certified seeds. ***(3 x ½ = 1½ marks)***

16.

- ***Banana***:- suckers.
- ***Pineapples***:- slips/crowns/suckers.
- ***Irish potatoes***:- stem tuber.
- ***Pyrethrum***:- splits. ***(4 x ½ = 2 marks)***

17.

- More seeds are used/seed wastage.
- Lack of uniformity in land coverge/uneven land coverage.
- Uneven planting depth/uneven germination/uneven growth.
- Difficult to carry out subsequent operations such as weeding, spraying, harvesting.
- Competition for nutrients, water, light leading to poor performance of the crop.
- Difficult to establish correct plant population.
- Difficult to mechanize. ***(2 marks)***

18.

- The original condition of the land, for example:- fallow/virgin/stubble etc.
- Size of the planting material/type of till required.
- Soil type.
- Type of implement available.
- Moisture content of the soil.
- Skill of the operator.
- Availability of capital.
- Slope of the land/topography.
- Type of crop. ***(2 marks)***

19.

- Determines the type of soil micro-organisms present.
- Determines availability of certain nutrients in the soil.
- Determines the presence of certain pests and diseases in the soil.
- Determines the type of crop to grow/type of weeds found.
- Determines types of fertilizer to apply. ***(1 mark)***

20.

- Irregular watering.
- Calcium deficiency in the soil or young fruits.
- Too much N-in early stages of growth. ***(2 x ½ = 1 marks)***

21.

- Ability to produce large quantities of seeds..
- Weed seeds remain viable in the soil for a long time.
- Easy and succsseful dispersal mechanism of most weed seeds.
- Ability of some weeds to propagate vegetatively.
- Ability to survive even under adverse environmental conditions.
- Ability to complete their life cycles in a short time.
- Elaborate or extensive root system. ***(3 x ½ = 2 marks)***

22. (a) Soil profile. ***(1 x 1 = 1 mark)***

(b) ***A:-*** Top soil/horizon A/zone A.
B:- Sub soil/Horizon B/ Zone B.
C:- Substatum weathered rocks/Horizon/zone C. ***(3 x ½ = 1½ marks)***

(c)

- Helps the farmer to choose appropriate crop to grow.
- Helps to determine depth of ploughing.
- Helps the farmer to determine the kind of foundations for farm structures.

(2 x 1 = 2 marks)

23. (a) Smut/head smut. ***(1 x 1 = 1 mark)***

(b) F *(1 x ½ = ½)*

(c) Seeds are uniform in size/shape/weight/maturity.
(N.B. Pegged on answer given to b) *(1 x 1 = 1 mark)*

(d)
- For anchorage/support.
- Absorption of water/nutrients form the soil.
- Photosynthesis/manufacture plant food. *(2 x ½ = 1 mark)*

(e) Plant population

$$= \frac{\text{planted area}}{\text{spacing}}$$

$$= \frac{9000\text{cm} \times 6000\text{cm}}{90\text{cm} \times 30\text{cm}} / \frac{90\text{cm} \times 60\text{cm}}{0.9\text{cm} \times 0.3\text{cm}}$$

$$= 20{,}000 \text{ plants}$$

24. (a) Songa/witch weed/striga spp. *(1 x ½ = ½)*

(b)
- Maize.
- Sorghum.
- Sugar cane.
- Napier grass.
- Millets.
- Highland rice. *(2 x ½ = 1 mark)*

(c) It relies heavily on the host crop for its nourishment. *(1 x 1 = 1 mark)*

(d)
- Crop rotation.
- Uprooting and destroying.
- Application of organic manure esp. FYM.
- Use of resistant varieties/tolerant varieties.
- Interplanting cereals with legumes.
- Use of herbicides. *(2 x ½ = 1 mark)*

25. (a) Balance sheet for Mrs. Sanda as at 30th June 2006.

ASSETS		**LIABILITES**	
Fixed Assets	Ksh	Long term liabilities	Ksh
Buildings	50,000		
Disc ploughs	16,000	Loan	50,000
Working tools	12,000		
Land	80,000		
Cattle	40,000		
Current Assets		Current Liabilities	

		Bank overdraft	24,000
Cash in hand	20,000	Creditors	20,000
Cash in bank	66,000	Total liabilities	94,000
Debtors	16,000	Net worth/owners equity Net Capital/balance	206,000
TOTAL	**300,000**	**TOTAL**	**300,000**

(6 marks)

(b)

- Whether the farm business is solvent or insolvent.
- For fair taxation.
- For obtaining credits or loans.
- Land value incase of sale.
- Value of assets and liabilities. ***(2 x ½ = 1 mark)***

26. (a)

- ***A source of food supply***: This sector supplies food to the population. It ensures healthy and strong people who participate in economic development activities/money saved is used on other economic activities.
- ***It is a source of employment***: This sector provides direct employment to over 70% of Kenya's population. Some are directly employed as farmers or farm workers while others are indirectly employed in the agro-based industries.
- ***It is a foreign exchange earner for the country***: Agriculture products such as coffee, tea, pyrethrum, horticultural products, livestock products from Kenya are exported to other countries. After exporting these they earn the country foreign currency which in turn is used to import other products such as machinery/saves money which would have been used for buying these commodities.
- ***It is a source of raw materials for industries***: Most of agricultural products require processing before use. Industries such as rice mills, breweries, canning factories and leather tanning have been set up to process such products.
- ***It provides a market for industrial goods***: Agriculture sector provides a market for industrial goods such as chemicals, tools, and equipment.
- ***It is a source of income/revenue***: This is used to purchase farms requirements such as tools, fertilizers, pesticides and machinery/government earns revenue from income tax from farmers to finance.
- ***Promotes international relationship***: This create jobs and foreign market.

(10 marks)

(b)

- By avoiding cultivating along water sources such as rivers.
- Avoiding cultivation during dry and windy periods.
- Prohibiting settlement of people near river valleys or water catchment areas.
- Prohobiting the excessive use of agrochemicals.
- Practicing soil conservation measures such as terracing, mulching, contour farming.
- Fencing of water sources.
- By using intergrated pest management (IPM) systems.
- By using efficient pesticide application techniques.
- By substituting or use of less toxic or less persistent or less leachable or biodegradable pesticides.
- By planting vegetation along the river banks to reduce siltation in rivers.
- Maintaining correct/appropriate stocking rate/avoid overgrazing.
- Proper disposal of waste and containers.
- Paper treatment of waste before disposal. ***(10 marks)***

27. (a)
- ***Improves soil fertility***: When legumes are included in the rotation, nitrogen is fixed/added in the soil.
- ***Control of pests/diseases***: Rotation of crops disrupts the life cycles of certain pests and diseases.
- ***Control of weeds***: It helps to control weeds which are specific to certain crops for example:- striga in cereals/cover crops in a rotation will smother certain weeds.
- ***Better use of the soil nutrients***: Different crops (due to differing root systems) draw nutrients from varying soil horizons/different crops have different nutrient demands, therefore when alternated leads to better nutrient utilization.
- ***Control of soil erosion***. Crops planted in rows for example:- maize should be alternated with cover crops to ensure that soil erosion is reduced.
- ***Improves soil structure***: Grass leys established will improve soil structure through the roots by binding soil particles together/during the grass ley period organic matter will accumulate to enrich the soil and improve soil structure.
  (10 marks)

(b)
- ***Growth habit of the crop/nature of plant growth***: crops that tiller, spread, creep, tall may require a wider spacing than those that do not.
- ***Intended use/purpose of the crops***: maize for silage is planted at a closer spacing than that for grain production.
- ***Type of machinery to use for field maintenance operation***: spacing adopted should allow passage for various operations such as weed control, spraying and harvesting.
- ***Soil fertility***: a fertile soil allows for closer spacing compared to poor soils.

- ***Moisture content of the soil/amount of rainfall in the area***: high moisure content/rainfall may allow closer spacing but low rainfall may necessitate wider spacing.
- ***Interplanted crops***: crops planted with others in rows will require wider spacing.

(10 marks)

28. (a)
    - To transfer land from European to Africans to enable the Africans to own land.
    - To settle the landless by transferring landless/squatters to new land allocation.
    - To make use of under utilized/idle land so as to increase production.
    - To create employment by working on the farm given to produce crops and keep livestock.
    - To increase agricultural production through better methods of land utilization and foreign markets through exports which earned foreign exchange.
    - To ease population pressure on land by transferring people from overpopulated areas to scarcely populated areas.

(10 marks)

(b)
- ***Leasehold/landlordism/tenancy***: This gives legal rights to an individual to own and use land at a payment for a specific period of time.
- ***Company/concession/plantation***: This is where company and government enter into an agreement on the use of land for a specific period of time.
- ***Communal land tenure***: This is where the whole community has the right to the use of land/each individual member of that community has equal rights to the use of the land.
- ***Individual ownership/individual owner operator/freehold***: This is where the land is owned by the individual (farmer) who either operates it or leases it to another person to operate.
- ***State ownership***: Here the government (state) controls land use, capital, enterprise, labour and marketing.
- **Co-*operative land tenure***: Here land is owned by a group of members who run it on co-operative basis. ***(10 marks)***

30.14.2 Agriculture Paper 2 (443/2)

1.
- Ambient temperature/humidity.
- Level of production/amount of work done by the livestock.
- Species of the livestock/breed/type of animal.
- Weight/size/age of livestock.
- Physiological status, for example:- health and pregnancy.
- Type of feed taken by the livestock. ***(4 x ½ =2***

marks)

2.
- Active ingredients of acaricide/ability to kill ticks.
- Persistence of the acaricide/stability of the acaricide/ability to remain effective after fouling with hair, mud, dung and dirt.
- Concentration of the acaricide in the mixture/dilution.
- Weather condition during application.
- Thoroughness/skill of application/method of application ***(3 x ½=1½ marks)***

3. Angora goat. ***(½ mark)***

4. ***Homogenization*** is the mechanical breakdown of large fat globules in milk into smaller fat particles which are then evenly distributed in milk, while ***Pasteurization*** is the heating of milk to a certain temperature followed by chilling in order to kill harmful bacteria that spoil the milk.
(1x1=1 mark)

5.
- Wire strainer.
- Monkey strainer. ***(1x ½ =½ mark)***

6.
- Driving wedges in when splitting wood.
- Braking/crushing big stones/Demolishing farm structures. ***(1 x ½=½ mark)***

7. The application of antibiotics into the teat canals of the cow's udder after drying off the cow to prevent mastitis/bacteria infection. ***(1 x 1=1 mark)***

8. Increased vigour and performance as a result of crossing two unrelated breed.
(1 x 1=1 mark)

9.
- Age of the equipment.
- Wear and tear/use.
- Lack of maintenance practice.
- Exposure to weather/improper storage.
- Wrong use of the equipment.
- Obsolescence/change in technology. ***(4 x ½=2 marks)***

10. For the attachment of trailed implement. ***(1 x ½=½ mark)***

11.
- The oil bath air cleaner/wet air cleaner.
- The dry type air cleaner. ***(2 x ½=1 mark)***

12.
- To prevent the germinal disc from sticking on the egg shell which may lead to death of the embryo.
- To make sure warmth is distributed evenly around the egg for uniform embryotonic development.

(1 x ½ = ½ mark)

13. Caecum. ***(1 x ½= ½ mark)***

14.
- Reinforcing with concrete.
- Cutting the top of posts at a slope.
- Covering the top of posts with metal plate.
- Charring/sling burning of posts.
- Applying wood preservatives scopper sulphate, cresole, pentach.
- Painting.
- Apply old engipe oil.
- Seasoning/propen diedrin/sodium dicronate drying tarnex. ***(2 marks)***

15.
- Spray race.
- Footbath.
- Housing/shed.
- Fences.
- Crush.
- Plunge dip. ***(4 x ½=2 marks)***

16. ***Mothering ability*** refers to that ability of the dam (mother) to take care of the offspring until weaning whereas ***Prolificacy*** is the ability of the female animal to give birth to many offspring at the same time, for example:- a litter. ***(1 x 1=1 mark)***

17.
- Zygote implanation is facilitated.
- Facilities production of more ova.
- Increases conception rate.
- Increases lambing percentage/encourages multiple births in ewes. ***(1 mark)***

18.
- It is used for cooking.
- Facilitates production of more ova.
- Increase conception rate.
- Increase lambing percentage/encourages multiple births in ewes. ***(3 × ½ =1 ½ marks)***

19. Birna virus/virus. ***(½ mark)***

20. (a) By restricting animal movements and their products from and into the affected areas in the event of an outbreak of a notifiable disease thus preventing the spread of the disease. ***(1 x 1=1 mark)***

(b) By preventing the occurrence of the disease using preventive drugs. ***(1 mark)***

21

- To avoid deficiency diseases.
- Make the animal robust/strong enough to be able to resist disease attack.

(2 x ½=1 mark)

22.

- Age of animal:- older animals are more prone.
- Stage of lactation period:- more prone at the beginning and also at the end.
- Udder attachment/large penclulous udders are more prone.
- Incomplete milking.
- Mechanical injury on the teats.
- Poor sanitation.
- Poor milking technique. ***(4x½=2 marks)***

23.

- Cause irritation.
- Damage the wool (due to scratching/lower quality of wool.
- Cause retarded growth.
- Cause anaemia.
- Bites and injuring the skin/create wounds. ***(2x 1 = 2 marks)***

24. (a) Landrace. ***(1 mark)***
(b) Hereford. ***(1 mark)***

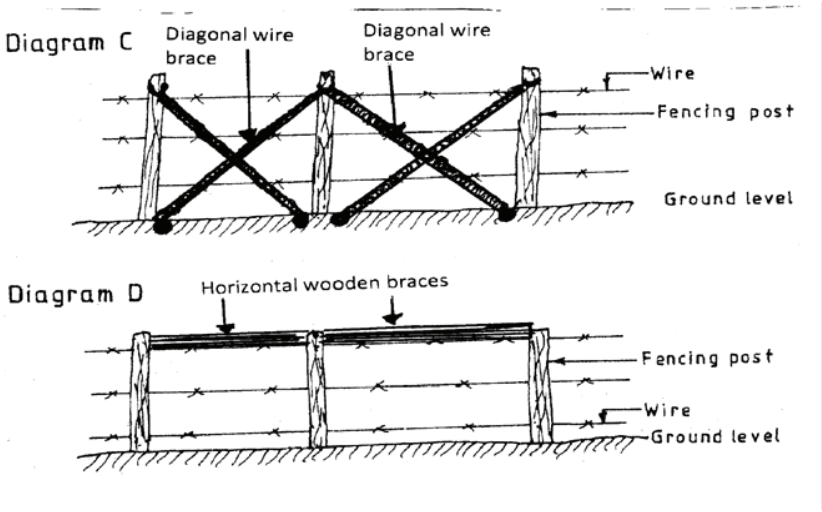
25. (a) ***B1***:- Milk secretory cells/alveoli cells/lactiferous alveoli.
B2:- Milk duct/mammary duct/lactiferous duct.
B3:- Gland cistern/milk/lactiferous sinus. ***(3 marks)***

(b)

- For milk secretion.
- For milk synthesis. ***(1 mark)***

(c) The lining of teat cistern/sinus/Teat canal. ***(1 mark)***

26. (a)



(2 marks)

(b) (i) ***E***:- Cannula
F:- Trocar ***(1 mark)***

(ii) Used to relieve bloat in animals/accumulation of gases in rumen.***(1×½= ½mark)***

(iii)

- Both equipment are inserted at the apex of the enlarged area, on the left side of the animal/plate/sublumbar renion.
- The trocar is then withdrawn while holding the cannula until the bulk of the gas escapes.
- Remove the cannula there after. ***(2 marks)***

27. (a) ***G***:- Fan.
H:- Fin/Radiator Fins.
J:- Head tank.
K:- Thermostat. ***(2 marks)***

(b)

- ***G (Fan)***:- used for blowing cool air current through the fins to assist in cooling hot water coming from the engine block as it moves to the head tank for further circulation.
- ***J (Head tank)***:- Holding/storing water for the cooling system.
- ***K (Thermostat)***:- used for regulation of the temperature of water in the engine.

28. (a)

- ***Stage 1***:- The eggs on the ground hatch into larvae which emerge and climb onto the host and feed on blood.
- ***Stage 2***:- The engorged larvae moult into nymphs which emerge and feed on blood.
- ***Stage 3***:- The engorged nymphs moult into adult which emerge and feed on blood of host.
- ***Stage 4***:- The engorged adults mate and the female drops to the ground. ***(4 marks)***

(b) A one-host tick. ***(½ mark)***

29. (a)

- Claw hammer: - For driving nails into the wood during construction and removing of nails from wood.

- Tinship:- For cutting sheet metal.
- Pliers:- For cutting wire.
- Mallet:- For hitting the chisel when cutting grooves in wood.
- Wood chisel:- For cutting grooves in wood or beveling.
- Jack plane:- For smoothening wood.
- Tape measure/rule:- For measuring lengths of materials to be used.
- Marking gauge:- Marking line on wood.
- Spirit level:- Determine the vertical/horizontal straightness.
- Hand saw/rip saw:- For cutting wood into pieces required.
- Clamp:- For holding pieces of wood together when cutting or joining wood.
- Screw driver:- For driving screws in wood or removing screws from wood.
- Scriber:- For marking lines or metal sheets.
- Try square:- To measure or determine the right angles. ***(10 marks)***

(b)

- Cost of the materials to be used.
- Availability of required skills/labour.
- Availability of capital for the kind of material
- Availability of materials required.
- Environmental conditions such as presence of pests, soil type climate.
- Durability/quality/strength of material.
- Type of the dairy shed-whether temporary or permanent.
- Toxicity of the materials to do the work in question.
- Toxicity of the materials to the animal, for example:- use of non-toxic painting materials like the white wash.
- Workability/applicability of the material.
- Farmers tastes and preferences. ***(10 marks)***

30 (a)

- Ensure the calf suckles the cow within the first 8 hours to get colostrums.
- Feed the calf on colostrums for the first four days.
- Feed the calf 2-3 times per day for the first 4 weeks.
- Introduce the feeding of whole milk/milk substitutes after the 4^{th} day.
- Feed the calf on correct amount of milk up to weaning.
- Feed the calf with warm milk to avoid calf scours/milk should be fed at appropriate temperature and at regular intervals.
- Provide adequate clean water to the calf from the 3^{rd} week.
- Introduce palatable dry feeds such as concentrates/calf pellets/calf pencils and good quality cut grass for the 3^{rd} week.
- Any change in feeding should be done gradually to avoid nutritional disorders.
- Clean equipment should be used for feeding calf.
- Calf should be trained to suck the milk from the bucket/bucket feed. ***(10***

marks)

(b)

- Milking equipment should be clean.
- Clean milking parlour/shed.
- The udder should be cleaned before milking.
- The milkman should be clean and healthy.
- The cows should be tested for mastitis before milking.
- Cows with mastitis should be milked last and milk disposed of.
- The milk should be sieved/filtered after milking.
- The milk should be stored in a cool dry place/proper storage.
- Cow should be healthy/check the cows regularly for milk-borne disease.
- The milk should be covered after milking.
- Feeds that can taint milk should be avoided/equipment that can taint milk should be avoided.
- Milk should be cooled immediately to reduce bacterial multiplication
- Chip hair around udder and flank. ***(10 marks)***

31 (a) (i)

- Is used to attach the trailed or mounted implements on a tractor.
- Lower links are hitched to the lower links of the implement.
- The adjustable top link is attached to the top link of the implement.
- The top link lifts the implement through the hydraulic power system when in operation or during transportation.
- The lower links hold the implement in place to provide stability.
- The check prevent the implement from getting into the tractor tyres when the tractor is moving.

(6 marks)

(ii)

- PTO is used to transmit power to operate various mounted and stationary implements/the short splined shaft/the tub shaft of the PTO at the rear of the tractor transmits power from the tractor to the implement.
- The extension shaft has a universal joints at both ends which are used of adjusting the distance between the tractor and the implement.
- The short splined shaft at the rear of the tractor is also used for attaching/coupling to the implement.

(4 marks)

(b)

- In this system the battery or generator supplies sparks which are required for ignition to take place.
- The ignition coil changes the low voltage from the battery to a high voltage current required in the spark plug in petrol engine.
- The condenser absorbs self induced current in the primary circuit hence preventing the contact breaker points from excessive pitting.
- It stores electric for a short time.
- The condenser passes on the electric current to the distributor which distributes the high voltage current to the spartk plugs.
- This causes the spark to occur at each cylinder in the required firing order.
- The contact breakers' function is to interrupt the normal flow of current in the primary circuit.
- An electric spart from the plug then ignites the air-fuel mixture in the cylinder, then the tractor engine

starts. ***(10 marks)***