4.15.1 Agriculture Paper 1 (443/1)

SECTION A (30 marks)

1. reasons for inter-cropping

- Conserve soil/water (cover cropping);
- Maximise production;
- Maximise utilization of nutrients in the soil;
- Control weeds;
- Control pests/diseases;
- Diversification'/spread risks
- Maximise labour utilisation/save costs on labour.
- Improve soil fertility if legumes are included.
- Maximise utilisation of land.

4 x $\frac{1}{2}$ **2 marks**

2. Advantages of intensive farming

- Increases production per unit area;
- Farm supervision is easy;
- Maximises utilization of available land;
- Ideal for densely populated areas/small land holdings;
- Utilizes technology to increase production.

4 x $\frac{1}{2}$ **2 marks**

3. reasons for early land preparation

- Allow time for weeds to dry and decompose;
- Allow for proper soil aeration;
- Allow timely planting / subsequent operations;
- Allow time for soil clods to disintegrate/soften.

4 x $\frac{1}{2}$ **2 marks**

4. reasons for deep ploughing

- Facilitates aeration;
- Facilitates drainage;
- Breaks hard pans/facilitates water infiltration;
- Bring up previously leached nutrients;
- Facilitate development of deep rooted crops;
- Expose lower soil layers to weathering;
- Expose soil borne pests and disease agents.
- Remove deeply rooted weeds.

4 x $\frac{1}{2}$ **2 marks**

5. **Conditions for purely competitive market**

- Large number of sellers;
- Large number of buyers;
- Homogeneous product;
- Same price for the product;
- Free entry and exit from the market;
- Buyers and sellers have perfect knowledge of market trends.

2 x $\frac{1}{2}$ **1 mark**

6. **Grading -** is the sorting of the produce into different lots, each with the same characteristics/ market quality while **Standardization** is the establishment of uniformity in the quality and quantity of the product.

Mark as a whole **2 marks**

7. **Benefits of agroforestry to a maize crop.**

- Leguminous trees fix nitrogen into the soil;
- Trees act as windbreaks;
- Trees stabilize soil against soil erosion;
- Leaf litter decompose to form humus/recycle nutrients;
- Trees improve and act as water catchment areas/conserve water.

4 x $\frac{1}{2}$ **2 marks**

8. **Intensive hedgerow**:- trees or shrubs are planted between rows of crops.

Border planting:- trees or shrubs are planted on the borders of the farm.

Mark as a whole **2 marks**

9. (a) **Mixed cropping:-** Is the growing of two or more crops on the same field but on different sections.

(b) Monocropping:- Is the growing of only one type of crop.

(c) Intercropping:- Is the growing of two or more crops in the same field at the same time.

3 x 1 **3 marks**

10. **Advantages of timely planting**

- Disease and pest control;
- Benefit from nitrogen flash;
- Weed control;
- Maximises rainfall utilization by the crop;
- Crop matures early when market prices are high/high demand.

4 x $\frac{1}{2}$ **2 marks**

(a) Advantages of row planting

- Field operations can be mechanized;
- Easy to establish plant population;
- Low seed rate than broadcasting;
- Facilitates cultural practices/accept specific practices;
- Ensures proper spacing
- Ensures uniform germination of seeds.

4 x $\frac{1}{2}$ **2 marks**

12. Importance of a nursery

- Many seedlings can be produced in a small area;
- Facilitates timely routine management practices;
- Provides best conditions for growth of seedlings;
- Small seeds and delicate seedlings grow into healthy and vigorous seedlings to facilitate transplanting;
- Reduced growth period in the field;
- Excess seedlings can be sold for income;
- Facilitate selection of healthy and vigorous/true to type seedlings for transplanting.

4 x $2\frac{1}{2}$ **2 marks**

13. **Monopoly:-** Market dominated by only one seller;

Monopsony:- Market dominated by only one buyer.

Mark as a whole **2 marks**

14. **(a)** **Cassava:** - stem cuttings/stems

(b) **Sisal:** - Bulbils
- Suckers

(c) **Pyrethrum:** - Splits

(d) **Sweet potatoes:** - Vines/stem cuttings

4 x $\frac{1}{2}$ **2 marks**

15. Characteristics of a good vegetable seedling

- Free from disease/pest/healthy;
- Vigorous growing;
- Free from physical deformities;
- High yielding;
- Correct stage of growth/height 10 - 15 tall/4 - 6 true leaves.

4 x $\frac{1}{2}$ **2 marks**

SECTION B (20 marks)

16. (a) Sprinkler/overhead irrigation. **1 x 1** **1 mark**

(b)
- Cleaning after use;
- Unblocking blocked nozzles;
- Lubricating rotating parts;
- Repairing/replacing broken/worn out parts;
- Proper storage after use;
- Oiling to prevent rusting;
- Tighten loose nuts.

2 x 1 **2 marks**

(c) Drip irrigation does not wet the foliage hence controls fungal diseases

1 x 1 **1 mark**

17. (a) Health record; **1 x 1** **1 mark**

(b)
- Selection/culling;
- Show health status;
- Determination of treatment costs;
- Show prevalence diseases;
- Trace history of disease for effective treatment eg. drugs used, action taken;
- Show schedules for routine practices e.g. vaccination, deworming, etc..

2 x 1 **2 marks**

18. (a) Ledger **1 x 1** **1 mark**

(b)

POULTRY							
DR				CR			
Date	Particulars	Folio	Amount	Date	Particulars	Folio	Amount
10/1/11	Bought 5 bags of layers mash	1	10,000.00	10/1/11	Sold 100 trays of eggs	1	20,000.00

Date - $\frac{1}{2}$
Particulars - 2 x $\frac{1}{2}$
Amounts - 2 x $\frac{1}{2}$
Folio - $\frac{1}{2}$

3 marks

19. (a) **A** - Increasing returns production function curve.
B - Constant returns production function curve.

2 x 1 **2 marks**

(b) The Law of diminishing returns.
If successive units of one variable input are added to fixed quantities of other inputs, a point is reached where additional (marginal/extra) product per additional unit of input declines. **1 x 1** **1 mark**

(c) (i) B **1 x 1** **1 mark**

(b) Other factors influencing limiting agriculture production.

1 x 1 **1 mark**

20. (a) Macro-nutrients:-
- Calcium;
- Nitrogen;
- Phosphorous;
- Carbon;
- Sulphur;
- Magnesium.

Mark as a whole **1 mark**

(b) Micro-nutrients:-
- Copper;
- Molybdenum;
- Zinc;
- Iron.

Mark as a whole **1 mark**

(c) Fertilizer elements:- Nitrogen, Phosphrous & Potassium.

Mark as a whole **1 mark**

(d) Liming elements:- Calcium; Magnesium and Sulphur.

Mark as whole **1 mark**

SECTION C (40 marks)

21.(a) Cultural soil and water conservation

- Grass/Filter strips:- reduce speed of flowing water/filter soil;
- Cover cropping:- prevents surface flow/reduces impact of rain drops/prevents evaporation/ volatilization;
- Contour farming:- creates ridges of soil which hold up water/reduce speed of run-off;
- Mulching:- reduces impact of rain drops/prevents evaporation/surface run-off;
- Rotational grazing:- allows grass to recover for soil and water conservation;
- Crop rotation:- maintain soil cover for protection against erosion/improves soil structure thus increasing infiltration;
- Inter cropping:- provides adequate cover on the soil;
- Strip cropping:- the different strips reduce speed of run-off/filter soil;
- Grassed/vegetated waterways:- slow the speed of water/trap eroded soil;
- Afforestation/Re-afforestation; Act as water catchments/stabilizes soil/canopy intercepts raindrops/wind;
- Agroforestry - stabilises soil/canopy intercepts raindrops/act as water catchment/wind;
- Use of manures/fertilizers; Promotes vegetative growth which covers soil against evaporation and erosion;
- Correct spacing of crops; Ensure adequate soil cover.

8 x 1 **8 marks**

(b) (i)
- Shortage of labour;
  Lack of motivation to invest in agriculture
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- Increased cost of living leading to low investment in agriculture/lack of resources for Agricultural production.;
- Government and NGOs are spending a lot of time and resources controlling the disease instead of investment in agriculture.
- Lack of market for agricultual produce.

4 x 1 **4 marks**

(ii)
- Establishment of national food security policy to supply free farm input to farmers to improve production;
- Facilitate soil conservation;
- Imposes laws to regulate quality of agriculture products;
- Imposes laws to regulate production and sale of agricultural produce to ensure sustainability;
- Imposes high taxes on imported agricultural products;
- Providing subsidies on agricultural inputs, e.g. fertilizers;
- Establishment of government agencies to supply inputs and market agricultural products;
- Construction of bulky handling and storage facilities for agricultural products;
- Funding research into new and improved agricultural production technologies;
- Ensures control of parasites/diseases/weeds is done effectively;
- Provision of extension services/education.

4 x 1 **4 marks**

(iii)
- Improper timing of routine practices;
- Lack of agricultural skills
- Low production of low quality ;
- Inappropriate decision - making e.g. disease observation and control;
- Delayed adoption of new and improved production technologies.
- Lack of knowledge to apply / types and / of inputs;
- Inability to collect market information.

4 x 1 **4 marks**

22. (a) Physical Pest Control
- Use of lethal temperature to kill the pests;
- Proper drying of produce to make it hard for pest to penetrate;
- Flooding drowns and kills pests;
- Suffocation to kill the pests in air tight containers;
- Physical killing of the pests /trapping and killing;
- Use of scarecrows /scaring away the pests;
- Use of physical barriers to prevent infestation by the pests;
- Use of electromagnetic radiation to kill the pests.

7 x 1 **7 marks**

(b) Factors for competitive ability of weeds
- Some produce large seed quantities to enhance survival chances;
- Some remain viable in the soil for a long time to await favourable conditions to germinate
- Some are easily and successfully dispersed to enhance chances of survival;

- Some have ability to propagate vegetatively into new plants;
- Some have extensive root system to enhance survival in drought conditions;
- Some have adaptations to survive where water/nutrients are limited through water and food storage modifications
- Some have a short life cyle which is completed early before adverse climatic conditions set in;
- Some irritate animals as a protective measure against grazing, trampling/some are tolerant to pests and diseases.
- Some are heavy feeders they make food faster than crop establishes.
- Some weeds have allelopathic effects which suppresses growth of other plants enhancing their survival.

8 x 1 **8 marks**

(b) Harvesting of Coffee

- Pick red ripe berries/cherries;
- Spread the berries on sisal mats and sort them out into Grades 1, 2 and 3 (Mbuni)
- Deliver grades 1 and 2 to the factory for pulping same day;
- Dry grade 3;
- Deliver grade 3 to factory at the end of harvesting season;
- Picking interval of 7 - 14 days.

5 x 1 **5 marks**

23.(a) Stem cuttings for Napier grass

- Select cuttings from a desirable variety;
- Select cuttings from healthy and high yielding mother plants;
- Make cuttings with 2 - 3 nodes;
- Place cuttings in planting holes in a slanting manner;
- Cover two nodes underground and one node above the ground.

5 x 1 **5 marks**

(b) Production of onions

(i)
- Clear the land;
- Prepare the land early;
- Plough/dig deeply and eradicate all weeds;
- Harrow to a moderate tilth/fine tilth/appropriate tilth. **3 x 1** **3 marks**

(ii)
- Thinning in directly planted crops to reduce competition;
  Weeding should be done carefully so as not to damage shallow roots.
- Remove excess soil from root region.
  Do not compact the soil around the bulb;
- Top dress with nitrogenous fertilizer/CAN at a rate of 250 Kg per ha three months after planting;
- Spray with appropriate pesticide/chemical to control pests especially thrips;
  Spray with fungicides or practice crop rotation to control fungal diseases;
  Watering during dry spell/season.
- **4 x 1** **4 marks**

(iii)
- Harvest after 5 months;
- Harvest when leaves start drying;
- Break or bend the tops at the neck to hasten withering;
- Dig up the bulb and leave them to dry under shade;
- Turn daily to ensure uniform drying;
- Store in slatted boxes;
- Leave bulb to dry under shade.

3 x 1 **3 marks**

(c) reasons for land Consolidation

- Proper supervision
  Saves time and travel costs between plots;
- Easy to offer extension services on the actual and on-spot inspection of land;
  Encourages sound farm planning and adoption of crop rotation programmes;
- Encourages soil conservation and land improvement;
  Encourages mechanization due to enlarged holdings;
- Encourages construction of permanent structures/undertake long term project investments;
- Enhances weed, pest and disease control.

5 x 1 **5 marks**

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SECTION A: (30 MArKS)

1.
- Dusting the birds with insecticide - sodium floride.
- Observing good hygiene.
- Fumigation/smearing the affected perches with volatile insectides.
- Picking and killing.

4 x $\frac{1}{2}$ = 2 marks

2.
- The doe throws herself on its side.
- Frequent urination.
- Vulva turns red and swells.
- Doe becomes restless.
- Doe rubs her body against the wall.
- Peeping/contacting other rabbits in adjacent hutches.

3 x $\frac{1}{2}$ = $1\frac{1}{2}$

3.
- Crushing and straining /squeezing method.
- Heating method.
- Use of centrifugal extractor.

3 x $\frac{1}{2}$ =$1\frac{1}{2}$

4.
- Hens stop laying eggs.
- Hens sit on eggs for long periods /continuously.
- Hen plucks off feathers to make a nest.
- Hens are aggressive when approached/walks with wings open.
- Characteristics cracking sound.

3 x $\frac{1}{2}$ = $1\frac{1}{2}$

5.
(a) Oxytocin effects last for five to seven minutes;
(b) Milk let-down is initiated when the milking time is reached;
(c) Prevent drying off/prevents reducing in yield/prevents mastitis infection.

3 x $\frac{1}{2}$ = $1\frac{1}{2}$ marks

6.
- Sight of calf
- Washing/massaging the udder.
- Feeding
- Sounds associated with milking.
- Sticking to a regular milking routine.
- Sight of milkman

4 x $\frac{1}{2}$ = 2 marks

7.
- Presence of sores/wounds on the skin.
- Irritation/scratching by the animal
- Loss of hair/*alopecia*.
- Anaemia
- Presence of various developmental stages of the parasite on the animal.

4 x $\frac{1}{2}$ = 2 marks

8. • Reduction of vigour in animals/loss of hybrid vigour/heterosis.
   • Quality of products is lowered.
   • Reduction in disease resistance ability.
   • Appearance of undesirable hereditary defects.
   • Increase in abortion/embryonic mortality.
   • Decline in fertility
   • Reduced production.

   4 x $\frac{1}{2}$ = 2 marks

9. • Cheap source of protein for the family.
   • Require little land and is possible where land is limiting.
   • Quick source of income for the farmer.
   • Makes fish to be available within the locality.

   4 x $\frac{1}{2}$ = 2 marks

10. • Allow for even distribution of fat in the body.
    • Control breeding.
    • Increasing growth rate.
    • To make them docile.
    • Control breeding diseases.

    2 x $\frac{1}{2}$ = 1 mark

11. • Checking for abnormalities/candling.
    • Selecting eggs of the right size/weight.
    • Cleaning/wiping off dirt.
    • Sorting and grading.

    2 x $\frac{1}{2}$ = 1 mark

12. • Do not make half-cuts/make complete cuts.
    • Shear sheep during the dry warm season.
    • Do the operation on a clean dry floor/use clean shearing equipment.
    • Do not cut body parts.
    • Use clean shearing equipment

    $\frac{1}{2}$ x 2 = 1 mark

13. • Foundation of the building.
    • The floor slab/floor.
    • The Lintel.
    • Pillars.
    • Walls.

    4 x $\frac{1}{2}$ = 2 marks

14. • Ratio of energy to protein in the feedstuff
    • Form in which the feed is fed to the animal/method of feed preparation.
    • Chemical composition of the feedstuff.
    • Species of the animal.
    • Amount of feed already present in the digestive system of the animal.
    • Rate of feeding/frequency of feeding.

    4 x $\frac{1}{2}$ = 2 marks

15. • Lack of calcium in the feed
    • Disease attack such as Newcastle

    2 x $\frac{1}{2}$ = 1 mark

16.
- Topography/slope of land should be gentle sloping.
- Reliable water source.
- Area with cracks/anthills should be avoided.
- Soil type/site should be free of gravel/stone/sand/preferably clay soil.
- Secure from predators and thieves.
- The site should be accessible.

4 x $\frac{1}{2}$ = 2 marks

17. Disadvantages of fold system:
- Few birds per unit area.
- Laborious in moving the folds.
- Difficult to keep individual bird production records.
- Produces dirty eggs.
- Fold breaks easily due to constant movement.

4 x $\frac{1}{2}$ = 2 marks

18. Dehorning methods:
- Use of sharp knife.
- Burdizzo and knife.
- Rubber ring and elastrator.
- Use of hot iron.

4 x $\frac{1}{2}$ = 2 marks

SECTION B: (20 marks)

19. (a) A - Reticulum/Honey comb.
B - Rumen/pauch.

1 x 2 = 2 marks

(b) A: - Separating fine and course food materials.
- Retaining indigestible food materials.

1 x 1 =1 mark

C: - Absorption of water.
- Grinding and sieving food particles
- Temporary food storage

1 x 1 = 1 mark

(c) Pepsin/Renin — 1 x 1= 1 mark

20. (a) K - Urethra — 1 mark
L - Testes/testis — 1 mark

(b) Epididymis - stores sperms — 1 mark
Seminal Vesicles - Secrete seminal fluid in which sperms move. — 1 mark

21. (a)
- Check egg abnormalities
- Monitor chick development during incubation
- Check whether the egg is fertile

1 x 1 = 1 mark

(b)
- A large dark section of developing chick.
- A small clear section of air space.

2 x 1 = 2 marks

22. (a)
F - Toe — 1 mark
G - Blade — 1 mark

(b)
- Sharpening of teeth regularly to improve efficiency.
- Regular cleaning after use to remove dirt.
- Setting the teeth to maintain cutting angles.
- Apply oil before storage to prevent rusting.

1 x 3 = 3 marks

23. (a)
A Ridger/mould board ridger. — 1 mark

(b)
(i) To make ridges/furrows — 1 x 1 = 1 mark

(ii)
- used to attach the implement to a tractor.
- Adjusting the depth of operation. — 1 x 1 = 1 mark

SECTION C: (40 marks)

24. (a) **reasons for keeping livestock healthy**

- Good health ensures a long economic and productive life.
- Healthy animals give maximum production/high performance.
- Healthy animals grow fast and reach maturity early.
- Healthy animals produce quality products which fetch good prices.
- Healthy animals do not spread diseases to other animals/human beings.
- Healthy animals are economical to keep/reduce production costs.

Any 5 x 1 = 5 marks

(b) **Symptoms of roundworm attack.**

- Anorexia/loss of appetite under heavy infestation.
- Stiff dry coat or starring coat
- Dehydration and pale mucosa.
- Eggs and adults are seen in faeces
- General emaciation
- Animal may diarrhoea
- Anaemic condition when infestation is heavy
- Pot-bellies especially in young animals.
- Coughing.

7 x 1 = 7 marks

(c) **Control measure for cannibalism**

- Avoid bright light in the house.
- Avoid overcrowding
- Provide balanced diet.
- Control external parasites.
- Hang vegetables in the house to keep birds busy.
- Debeak birds which peck at others.
- Cull perpetual cannibals/birds with prolapse.
- Provide adequate equipment feeders, waters, perches.
- Avoid introduction of new birds in the stock.

8 x 1 = 8 marks

25. (a) **Body conformation features of a dairy heifer.**

- Straight topline.
- Have large and well developed udder with large teats.
- Have large stomach which makes them heavy feeders
- Have prominent milk veins.
- Have less flesh on their bodies/lean bodies.
- Have well set hind quarters to allow room for large udders.
- Prominent pin bones.
- Wedge shaped.
- Long thin neck.

Any 5 x 1 = 5 marks

(b) **disadvantages of live fences**

- May take long to establish into an effective fence.
- Not effective in sub-dividing land into paddocks/occupies a large space.
- May harbour pests.
- May create hiding places for thieves, wild animals and vermin.
- May be labour demanding to trim and infill regularly.
- May have shading effects on crops/competition for nutrients, moisture.
- May leave gaps which allow animals and thieves to pass through.
- Some may injure both livestock and the farmer.

(7 marks)

(c) **How a for stroke cycle Engine works**

- Induction stroke/intake

  - Piston moves down the cylinder causing the inlet valve to open drawing in fresh supply of petrol vapour and air into the cylinder.

- Compression stroke

  - The inlet valve closes and the piston moves up the cylinder. This compresses the fresh fuel mixture in the combustion chamber.

- Power Stroke/ignition

  - A spark is produced at the spark plug. This causes the fuel mixture to ignite and expand resulting in pressure that forces the piston to move down the cylinder.
  - Both valve closed.

Exhaust stroke

- The piston moves up the cylinder to eliminate the burnt fuel mixture through the open exhaust valve.

Any 4 x 2 = 8 marks

26. (a) **Management practices on calves**

- Culling highly susceptible calves.
- Spraying with appropriate acaricides to control external parasites/ticks.
- Drenching with antihelminthes to control internal parasites.
- Vaccinate as appropriate against diseases
- Castration of males not required for breeding.
- Identification at the appropriate age to facilitate record keeping.
- Removal of any extra teats if more than four.
- Debudding/Dehorning
- Proper feeding of the calf.
- Treat the sick.
- Isolate the sick calves.
- Maintenance of hygiene.

Any 7 x 1 = 7 marks

(b) Brucellosis

(i) Causal organism

- Bacteria/*Brucella abortus/mellitensis/suis/sp*

1 x 1 = 1 mark

(ii) Animals affected

- Cattle
- Sheep
- Goats
- Pigs

2 x 1 = 2 marks

(iii) Symptoms

- Sponteneous abortion/premature births.
- Retained placenta.
- Infertility in females.
- Low libido in males.
- Orchitis/inflamed testis.
- Yellowish/brown slimmy discharge.

(iv) **Control**

- Use of A.I.
- Culling/slaughter and properly dispose the carcass.
- Vaccination.
- Avoid contact with aborted foetus.
- Blood test to detect infected animals.
- Observe proper hygiene.