

4.15 AGRICULTURE (443)

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.

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

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.

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

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.

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

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.

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

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/conserves water.

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

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.

3x1

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.

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

2 marks

11. **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.

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

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 $\frac{1}{2}$

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

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

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.

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

2 marks

SECTION B (20 marks)

16. (a) Sprinkler/overhead irrigation. **1x1** **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.

2x1 **2 marks**

- (c) Drip irrigation does not wet the foliage hence controls fungal diseases **1x1** **1 mark**

17. (a) Health record; **1x1** **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..

2x1 **2 marks**

18. (a) Ledger **1x1** **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 - 2x $\frac{1}{2}$
 Amounts - 2x $\frac{1}{2}$
 Folio - $\frac{1}{2}$

3 marks

19. (a) **A** - Increasing returns production function curve.
B - Constant returns production function curve. **2x1** **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. **1x1** **1 mark**
- (c) (i) B **1x1** **1 mark**

(ii) Other factors influence / limit agriculture production.

1x1

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, Phosphorous & 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.

8x1

8 marks

- (b) (i) · Shortage of labour;
- Lack of motivation to invest in agriculture

- 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 agricultural produce.

4x1 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.

4x1 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.

4x1 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.

7x1 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 cycle 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.

8x1

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.

5x1

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.

5x1

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.
- (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.

4x1

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.

3x1

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.

5x1

5 marks

4.15.2 Agriculture Paper 2 (443/2)

SECTION A: (30 MARKS)

1. · Dusting the birds with insecticide - sodium flouide.
· Observing good hygiene.
· Fumigation/smearing the affected perches with volatile insecticides.
· Picking and killing.
- 4x $\frac{1}{2}$ = 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.
- 3x $\frac{1}{2}$ = 1-2
3. · Crushing and straining /squeezing method.
· Heating method.
· Use of centrifugal extractor.
- 3x $\frac{1}{2}$ = 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 $\frac{1}{2}$ = 1-2
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 2 = 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 ~~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.
- 4x $\frac{1}{2}$ = 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. 4x 2¹ = 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. 4x 2¹ = 2 marks
10. · Allow for even distribution of fat in the body.
· Control breeding.
· Increasing growth rate.
· To make them docile.
· Control breeding diseases. 2x 2¹ = 1 mark
11. · Checking for abnormalities/candling.
· Selecting eggs of the right size/weight.
· Cleaning/wiping off dirt.
· Sorting and grading. 2x 2¹ = 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 2¹ x 2 = 1 mark
13. · Foundation of the building.
· The floor slab/floor.
· The Lintel.
· Pillars.
· Walls. 4x 2¹ = 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. 4x 2¹ = 2 marks
15. · Lack of calcium in the feed
· Disease attack such as Newcastle 2x 2¹ = 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.
- 4x 2¹ = 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.
- 4x 2¹ = 2 marks
18. Dehorning methods:
 · Use of sharp knife.
 · Burdizzo and knife.
 · Rubber ring and elastrator.
 · Use of hot iron.
- 4x 2¹ = 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.

493

- 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*

- (ii) Animals affected
 - Cattle
 - Sheep
 - Goats
 - Pigs

- (iii) Symptoms
 - Spontaneous 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.