

## 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.

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/conserves 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

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.

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  $\frac{1}{2}$

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	-	$\frac{1}{2}$		<b>3 marks</b>

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**

(ii) Other factors influence / limit 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, 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.

**8 x 1**

**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.

**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 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.

**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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#### 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 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  $\frac{1}{2}$  =  $\frac{1}{2}$
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  $\frac{1}{2}$  =  $\frac{1}{2}$
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  
L - Testes/testis

1 mark

1 mark

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

1 mark

1 mark

21. (a)
  - Check egg abnormalities
  - Monitor chick development during incubation
  - Check whether the egg is fertile1 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 anthelmintics 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
- Spontaneous abortion/premature births.
  - Retained placenta.
  - Infertility in females.
  - Low libido in males.
  - Orchitis/inflamed testis.
  - Yellowish/brown slimy 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.