

## 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 flush;
  - 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 -  $2 \times \frac{1}{2}$   
 Amounts -  $2 \times \frac{1}{2}$   
 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**

(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**