**443/1**

**AGRICULTURE PAPER 1**

**MARKING SCHEME –**

 **SECTION A (30 MARKS)**

1. It is the growing of crops and rearing of livestock without using agricultural chemicals 1mk

2. Soil constituents

 (a) Soil air

 (b) Soil water

 (c) Mineral matter

 (d) Organic matter

 (e) Living organisms 3 x ½ (1 ½ mk) Max 1½ mk

3. Benefits of crop rotation

* Improves soil fertility
* Control weeds
* Improve soil structure
* Control soil erosion
* Maximum utilization of nutrients
* Control build-up of soil borne pests and diseases (4 x ½) = 2mks

4. Disadvantages of Hydram pums

* Pumps only stationery water
* Pumps little quantities of water (2 x ½) = 1mk

5. Benefits of land consolidation

* Economic use of time
* Saves transportation cost
* Proper supervision of land
* Sound farm planning and adoption of crop rotation programmes
* Makes delivery of agricultural advice by extension officers easy
* Easy to construct permanent structures like fencing and building
* Easy to control pests, weeds and diseases
* Easy to conserve soil and water (Any 4 x ½ ) 2mks

6. (i) Parasitic weed to maize

 - Striga / witch weed 1 x ½ = ½ mk

 (ii) Alternate weed to rusts

 - Wild oats / avena fatua 1 x ½ = ½ mk

 (iii) Aquatic

- Salvinia (salvinia Guriculata)

- Water hyacinth (Eichhornia crassipes) Any 1 x ½ = ½ mk

 (iv) With medicinal value

* Sodom apple (Solanum Incanum)
* Double thorn (oxygonum stinuatum) Any 1 x ½ = ½ mks

7. How nitrogen is lost from the soil

* Volatilisation
* Leaching
* Combustion
* Denifrification (Any 3 x ½ mk) 1 ½ mk

8. Benefits of mulching in soil and water conservation

* Reduces speed of run-off
* Reduces rate of evaporation
* Prevents splash erosion
* Increase water retention
* Increases water infiltration
* Increases organic matter thus improving drainage (Any 4 x ½ mk) = 2mks

9. Disadvantages of organic manures

* Spread of diseases, pests and weeds
* Bulky to transport and apply
* Labourious in application and transportation
* Loses nutrients if poorly stored
* Do not benefit crops if used when not fully decomposed (Any 4 x ½ mk) 2mks

10. (i) Opportunity cost is the returns from the best alternative forgone (W.T.E) 1mk

 (ii) Types of inventory records

* Permanent goods inventory
* Consumable goods inventory (2 x ½ mk) = 1mk

11. Importance of sub-soiling

* Encourages gaseous exchange in soil (aeration)
* Breaks hard pans
* Brings leached minerals to the surface
* Improves soil drainage (Any 2 x ½ mk) = 1mk

12. Sillage losses

* Surface spoilage
* Seepage losses
* Gaseous losses (3 x ½ mk) 1 ½ mk

13. (i) Destructive effects of moles

* Destroys crop roots thus interfering with absorption of water and nutrients
* Pulls plants underground causing their death
* Spoils pastures by covering them with soil from burrowed tunnels (Any 2 x ½ )1mk

(ii) Other rodent pests

* Squirrels
* Rats
* Mice
* Porcupine
* Hedgehogs (Any 2 x 1 ½) = 1mk

14. Fixed inputs (characteristics)

* Constancy
* Not varying with level of production
* Their costs are not allocated to specific enterprises (3 x ½ mk) = 1 ½ mk

15. Financial Documents

* Invoice
* Receipt
* Delivery note
* Statements
* Purchase order (Any 4 x ½) = 4mks

16. Field pest that attack maize

* Maize stalk borer (ReJ: stalk borer)
* Army worm
* Aphid
* Birds
* Rats (Any 4 x ½) = 2mks

17. Agriculture is the rearing of bees in beehives

 Aquaculture is the rearing of fish in fish ponds (Mark as a whole) 1mk

18. Ways through which burnings leads loss of soil fertility

* Destroys organic matter
* Ash accumulation leads to nutrient imbalance
* It kills/ destroys soil micro-organisms
* Exposes soil to agents of soil erosion
* Destroys soil structure increasing soil erodability
* Exposure of soil nutrients to high temperature causes increased volatilization of nutrients (Any 2 x ½) 1mk

19. Benefits of hardening off

* Reduces chances of drying-up of seedlings after transplanting
* Enables seedlings to establish themselves faster in the main field

SECTION B (20 MARKS)

20. (i) Trelishing (1mk)

 (ii) Passion fruit

 Tomatoes (Any 1 x 1) 1mk

 (iii) Benefits of trelishing (Any 1 x 1) 1mk

* Ensures production of clean fruits
* Enables easy harvesting
* Enable easy spraying of chemical
* Control of fungal diseases
* Controls growth pattern of the crop (Any 2 x 1) = 2mks

21. (i) Marketing record (1mk)

 (ii) Kshs. 4,800/- (1mk)

 (iii) Profit and loss account (1mk)

22. (i) Mith

 (ii) It is too small in size (microscopic) to be noticed easily/early

 It breeds fast leading to higher pest population within a short period of time

(2 x 1) = 2mks

 (iii) The pesticide kills its natural enemies which naturally help in biological control of

the pest e.g. termites (1mk)

23. (i) Row planting (1mk)

 (ii) 30Lm (1mk) Rej: 30cm by 60cm

 (iii) Advantages of row planting

* Easy to establish crop population
* Easy to use machines between the rows
* Low seed rate is used
* Easy to estimate crop yield
* Easy to carry out cultural practices e.g. weeding, spraying, harvesting etc

(Any 3 x 1 = 3mks)

 (iv) Plant population = Area of land √1mk

 Spacing

 Area of Land = 600cm x 300cm √1mk

 Spacing = 30cm x 60cm

 PP = 600cm x 300 √1mk

 30cm x 60cm

 180,000cm 100 plants √1mk

 1800cm Total = 4mk\

**SECTION C (40 MKS)**

24. (a) Challenges facing vegetable farmers

* High cost of farm inputs
* Lack of storage facilities leading to spoilage of produce
* Poor transport network leading to deterioration of produce before reaching market
* Lack of technical knowhow on the best farming practices to adopt when growing the crops
* Inadequate market for their produce
* Exploitation by middlemen
* Unfavourable environmental factors e.g. poor rainfall patterns: poor soils
* Pests and diseases
* Inadequate extension (10 x 1 ) = 10mks

(b) Safety precautions observed when using herbicides

* Read and follow manufacturers instructions
* Wear protective clothing
* Avoid inhaling the herbicides by not spraying against wind, not smoking and wearing a breathing mask
* Don’t blow or suck blocked nozzles with the mouth
* Bath thoroughly after handling the chemicals
* Keep chemicals out of reach of children (safe storage)
* Proper disposal of empty containers
* Don’t wash spraying equipment in water sources (Any 5 x 1mk = 5mks)

(c) Benefits of minimum tillage

* Reduces cost of cultivation
* Control of soil erosion
* Maintain soil structure
* Conserve soil moisture
* Prevent disturbance of crop roots
* Prevent exposure of humus to suris heat (Any 5 x 1mk = 5mks)

25. (a) How land fragmentation increases production cost

* Increased transport cost moving from one plot to another
* High Managerial cost for the different plots
* Increased cost of extension advice visits
* High cost of pest, weed and disease control
* High costs of replacing temporal fences and other structures on the different plots
* Poor farm mechanization causing manval operations which are expensive

Any other relevant point (Any 5 x 1mk = 5mks)

 (b) Importance of top-dressing in pasture establishment

* Replenish soil nutrients and ensure proper nutrient balance
* To increase herbage yield
* To improve the nutritive value of the crop
* To correct/amend physical and chemical properties of soil e.g. soil structure, water holding capacity and soil PH
* To enable the soil micro-organism to break down organic resolves into available nutrients (5 x 1mk) = 5mks

(c) Factors influencing soil erosion

* Type of soil – sandy soils are easily eroded than clay soils
* Amount and density of rainfall – Heavy rainfall causes more erosion
* Slope of land/topography – steep slopes increase erosion rate
* Soil depth – shallow soils are easily eroded
* Vegetation cover – Bare lands are easily erodes
* Human activities – activities like deforestation, overgrazing, burning of vegetation cover and clean weeding encourage soil erosion

*Any five well explained x 2 marks = 10mks*

26. Importance of Nursery Management practices in crop production

* Mulching – Helps to conserve moisture but should be removed immediately seedlings begin to emerge
* Weed control – To avoid competition for water and nutrients
* Shading- Prevents loss of soil moisture and prevent direct sun heat to the seedlings

Pricking out – To prevent overcrowding of seedlings and excessive competition

Watering – To supply adequate moisture to the seedlings to avoid drying of the seedlings

Pest and disease control - To control death of seedling

* To prevent quality reduction

Hardening off – To prepare seedling to adapt to conditions in the main field

*(Any five well explained x 2 mks = 10mks)*

(b) Functions of a Farm Manager

* Long term planning
* Short term planning
* Implementing farm plans
* Taking responsibility of outcome of farm activities
* Comparing standards of one enterprise and the set standards
* Keeping farm records upto date
* Detecting weaknesses and constrains and finding ways of overcoming them
* Acts as the farm spokesman
* Gathering information
* Comparing performance of the farm with the neighbouring farms
* He / she is the overall farm supervisor *(Any 10 valid points x 1mk = 10mks*