SECTION A (40 Marks)

1. o When the fertility of the soil goes down, crops are not grown again until the soil regains its fertility.

   o Carried out where plenty of land is available / low populated areas.

   o Characterized with annual crops but not perennial crops.

   o Agricultural output from the whole system is low/subsistence production.

   o Inputs such as pesticides, fungicides/fertilizers are rarely used.

   o Build up of pests and diseases is avoided by periodic movements to the new areas.

   o Simple hand tools commonly used. (3x½=1½ marks)

2. o Provides food for both rural and urban population.

   o Earns foreign exchange for the country.

   o Provides raw materials for industrial use.

   o Provides market for industrial goods.

   o Farmers earn a lot of income.

   o Provides employment both directly and indirectly.

   o Promotes international relationship, co-operation.

3. (a) Benefits of a good soil structure. o Allows proper infiltration/drainage of water. o Provides good aeration.

   o Allows proper water holding capacity.

   o It is not easily eroded.

   o Enhances proper root development and tuber expansion / penetration. (3x½=1½marks)

   (b) TWO cause of hardpan in a crop field.

   o Ploughing at the same depth season after season.

   o Use of heavy machinery on wet soil. (2x½=1mark)

4. o Kill weeds.

   o To burry organic matter/crop residue into the soil.

   o To loosen the soil for better aeration / water infiltration.

   o To improve root penetration.

   o To control soil borne pests/diseases.

   o To make subsequent operations easier.

5. o Rapid growth rate.

   o Production of abundant foliage/ leafy.

o Rich in plant nutrients/leguminous plants.

o Ability to decay quickly.

o Adaptable to a wide range of conditions / hardy. (3x½=1½marks)

6. o Where there are no alternative enterprise to choose from.

o Unlimited resources/resources are free. (2x½=1mark)

7. o Crops make maximum use of rainfall and suitable soil temperature, hence vigorously growth.

o Easy for crops to escape pest and disease attack.

o Crops establish earlier than the weeds hence smothering them.

o Crops benefit from nitrogen flush which is available of the beginning.

o The produce is marketed at high market price especially horticultural crops. (2x½=1mark)

8. Distinguishing between the following terms:

(i) Under sowing and over sowing.

o Under sowing is the establishment of a pasture crop under an already

existing growing crops / cover crop/ nurse crop Over sowing is the establishment of

a pasture legume in an existing grass pasture.(1x1=1mark)

(ii) Coppicing and capping:

o Coppicing is a practice of cutting tree branches at specific points in order

to achieve a desirable shape; coppicing is a process commonly done in

coffee that involves cutting back the main stem at the height of 53 cm,

where the young coffee plant is 69 cm tall.

(iii) Earthing up and ridging:

o Earthing up is the mounding / heaping of soil around the base of the plant;

Ridging is the process of digging soil in a continuous line and heaping it on

one side to form abund (ridge)and furrow.(1x1=1 mark)

(iv) Thinning and gapping:

o Thinning is the uprooting or removal of excess seedlings to allow space for remaining seedlings.

o Gapping is the filling up or replacement of the dead seedling. (1x1=1 mark)

9. o Improve nitrogen fixation.

   o Improve nodulation.

10. o Chlorosis.

    o Stunted growth.

    o Premature ripening of crops.

    o Premature leaf fall.

    o Formation of purple pigments/Anthocyanin pigment.

11. o Type of soil. o Soil moisture content.

    o Type of crop to be grown / rooting system of the crop.

    o The machinery/equipment being used.

    o Condition of land.

    o Skill of the operator.

12. **(a) Vegetative materials for propagation of the following crops.**

    (i) Bananas: -Suckers (1x1=1 mark)

    (ii) Sisal: - suckers /Bulbils. (1x1=1 mark)

    (iii) Pyrethrum :- splits 1x1=1 mark

    (b) Advantages of using seeds in propagating crops.

    o Seeds are convenient to handle, store and transport.

    o Easy to carry out treatment against pests and diseases.

    o It is the only possible method of propagating certain crops such as maize and beans.

    o Easy to mechanize some operation such as planting. o Requires less skills.

    o Possible to apply manures and fertilizers together with seeds during planting.

    o Possible to develop new crop varieties due to cross pollination.

    o They are relatively cheap. (3x½=1½ marks)

13. o Prevents splash erosion rain drop erosion.

    o Reduce the speed of run off, hence reducing erosion/increase water infiltration.

    o Reduces evaporation.

    o Increases organic matter and water retention capacity upon decomposition.

14. o Leaf angle.
    o Difference in the root system.
    o Location of the growing points.
    o Difference in height of the plants.
    o Nature of the leaf surface.
    o Specialized structures.
15. (a) Reasons why farmers prefer to use herbicides to control weeds:
    o Possible to control weeds in certain crops such as wheat, barley and carrots which are closely spaced/Easy to control weeds in closely spaced crops.
    o Requires less labour than mechanical weed control.
    o Cheaper in the long run. o Efficient in both dry and wet conditions.
    o Are effective in the control of some weeds as couch grass/sedges/Rhizomatous.
    o Herbicides application do not disturb the soil structure.
    o Do not disturb crop roots and other underground structures. (3x½=1½ marks)
    (b) Insects pests with biting and chewing mouth parts: o Locusts.
    o Cut worms.
    o Grasshoppers.
    o Crickets.
    o Maize stalk borer.
    o Army worms.
    o Bollworms.
    o Termites.
    o Larval stages of beetles. (2x½=1mark)
16. o Cambered beds.
    o French drains.
    o Underground pipes.
    o Open ditches.
    o Pumping out water.
    o Planting of trees.
17. o Rose coco (GLP2)

o Mwezi moja (GLP 1004)

o Canadian wonder (glp24)

o K74

o Wairimu

SECTION B (20 Marks)

18. (a) 1- crown 2-slip 3-sucker (3x1=3marks)

(b) Why some vegetative part should not be used:

(i) Ri-Too soft. (1x1=1 mark)

(ii) Ki-woody/hardy/old part (1x1=1 mark)

(c) FOUR practices that should be carried out in the nursery:

o Mulching. o Watering.

o Weed control.

o Pricking out.

o Shading.

o Hardening off.

o Pest and diseases control. (4x½=2 marks)

(d) Factors likely to affect rooting of cuttings:

o Temperature. o Relative humidity.

o Oxygen concentration.

o Chemical treatment.

o Leaf area.

o Light intensity. (4x½=2 marks)

19. **(a) Aim of the experiment:**

o To compare the porosity / water –holding capacity in different types of soils.

o Infiltration rates(1x1=1mark)

(b) Type of soil in experiment:

(i) R -Sandy. Reason: High porosity/drainage/more water passes through.

(ii) T -Loam soil; relatively high amount of water passes through/moderately well drained. (2x½=1 mark)

(c) Ways in which soil labelled T can be made suitable for farming:

o Draining.

o Liming.

o Application of organic matter. (2x½=1 mark)

(d) Soil that can lose water easily.

o Soil labelled R. (1x1=1 mark)

20. **(a) Identification of pest:**

(i) Rodent.

(ii) - Unearth and at seeds.

- Dig up and eat-roots /tubers.

- Climb up maize stalks to eat grains. (2x½=1mark)

(iii) Ways of controlling pest:

o Poisoning/ Baiting.

o Trapping.

o Scare crows.

o Pursuing and killing. (2x½=1mark)

(b) Identification of the disease.

(i) P-Maize smut. (1x1=1 mark)

(ii) Cause:-Fungus/ustilage ssp /maides. (1x1=1 mark)

(iii) TWO control measures:

o Timely planting / early planting.

o Field hygiene. o Crop rotation.

o Rogueing.

o Use of resistant varieties.

o Seed treatment with an appropriate fungicides

o Planting of certified seeds. (2x½=½ mark)

SECTION C (30 Marks)

21. (a) Crop rotation: Is the practice of growing different types on the same piece

of land following a definite sequence.

(b) Why crop rotation is important: o Improves soil fertility when legumes are included to fix nitrogen.

o Control of crop pests and diseases by disrupting the life cycle of certain pests and diseases.

o Control weeds which are specific to certain crops/cover crops when included smothers weeds.

o Better use of soil nutrients when shallow rooted plants are rotated with deep rooted plants/shallow

rooted use nutrients from the upper surface of the soil, while deep rooted use nutrients from deep depth.

o Control of erosion when annual crops are alternated with cover crops/Grassley

is allowed / where cover crops are included.

o Improves soil structure where grass ley is included when which bind

the soil particles together. 7 well explained points =7x1=7 marks

(c) Effects of erosion on farming:

o Soil erosion leads to loss of soil nutrients and organic matter.

o It causes silting in rivers and water reservoirs.

o Can lead to destruction of crops.

o Eroded soil may cover crops.

o It destroys infrastructure such as roads.

o It removes or disturbs micro-organisms in the soil. (6x1=6 marks)

(d) Benefits of weeds to the farmer:

o Weeds binds particles together hence help in reducing erosion.

o Most weeds are used as livestock feed.

o Weeds decay and add organic matter to the soil.

o Weeds can be used as litter in livestock houses.

o Weeds can be used as mulch.

o Some weeds are used as vegetable/human food.

o Leguminous weeds fix nitrogen. o Some weeds have medicinal value. (6x1=6 marks)

22. **(a) Production of Guatemala grass:**

(i) Land preparation: o Prepare the land early / during dry season.

o Carry out primary cultivation.

o Clear the land.

o Carry out secondary cultivation.

o Secondary cultivation should be of medium tilth.

o Carry out soil and water conservation.(3x1=3marks)

(ii) Planting:

o Planting –Early/onset of rains.

o Established from stem cuttings/splits.

o Seeds can also be used.

o Furrows made at the spacing of 1m apart.

o Cuttings or splits planted at 0.5 m apart within the rows.

o Holes can also be used.

o Use phosphatic fertilizers.

o Use NPK fertilizers.

o Apply at the rate of 150kg/ha NPK. (3x1=3 marks)

(iii) Defoliation:

o Harvested when it is over 8-12 weeks because it takes long time to flower

o Harvested by cutting at the base. (1x1=1 mark)

(iv) Utilization:

o Chopped and fed to livestock as green fodder.

(b) Procedure for picking pyrethrum:

o Use fore fingers and thumb in picking.

o Pick by twisting the heads so that no stem is left attached.

o Put the picked flowers in the woven basket. (4x1=4 marks)

(c) (i) Land preparation for carrot production:

o Prepare the land early.

o Clear the bush using appropriate tool.

o Carry out primary cultivation using appropriate tool/deep ploughing.

o Carry out secondary cultivation/harrowing.

o Attain fine tilth. (3x1=3marks)

(ii) Field management practices in carrots:

o Thinning to attain a distance of 3-4 centimeters between

plants/suitable distance between plants.

o Weed control to keep the field weed free/reduce competition for soil resources.

o Top dressing using nitrogenous fertilizers.

o Control of pests and diseases. (4x1=4 marks)

23. (**a) Ways through which soil lose its fertility:**

o Through erosion, where top fertile soil is carried away.

o Leaching whereby nutrients are carried to lower layers where plant roots cannot reach it.

o Development of hard pans and soil capping which prevents free circulation of air in the soil.

o Change of soil PH that makes some nutrients un available to plants.

o Fixation of nutrients into insoluble forms, hence make them an available to plants for use.

o Mono-cropping which leads to depletion of some nutrients /build up of pests and diseases.

o Continuous cropping which leads to loss of soil nutrients through uptake by plants.

o Denitrification of nitrates, making it an available for plant use.

o Salination which makes plants to loss water. (8x1=8 marks)

(b) Factors considered in choosing correct seed rates:

o Should be well adapted to the local ecological conditions.

o High yielding. o Material should be healthy /free from pests and disease attack.

o Materials should be mature.

o Should be disease resistant.

o Seeds should be large in size and appropriate shape. (7x1=7 marks)

(c) (i) Land tenancy:-

This is where the landowner/landlord transfers the right to the use of land to another person/tenant. (1x1=1 mark)

(ii) Disadvantages of tenancy system:

o No incentive to make permanent investment on land.

o No incentive to carry out soil conservation measures especially where the lease hold is short

o The method of rent payment may discourage the tenant from investing heavily on the land.

o There is no title to act as security. (4x1=4 marks)