AGRICULTURE MWAKICAN MARKING SCHEME

Paper 1

1. **Agriculture economics**

It is a branch of agriculture which deals with the utilization of scares resources, aiming at minimizing output while minimizing cost……….1mk.

1. **Reasons for carrying out minimum tillage**

-To maintain soil structure

- Conserve moisture

- Control soil erosion

- Reduce cost of cultivation

-Prevent disturbances of root and underground structures eg tubers/bulbs etc

-Prevent exposure of humus sunlight to avoid volatilization

 **4x ½ =2mks**

 3. **Conditions under which opportunity cost is zero**

 -When there is no alternative

 -When resources are not limited

 -When the commodity is offered freely

 **2x ½ =1mk. .**

1. **Limitations of pastoral farming.**

 **-** Encourages spread of livestock parasite and diseases

 - Breeding control is not practiced.

 -Low productivity as animals waste energy moving from one place to another.

 -Causes ethnic conflict.

 - There is tendency to overstock leading to overgrazing and soil degradation.

 **-** Encroachment of reserve leading to conflict with government.

 **4x ½ =2mks**

1. **Factors that would determine the depth and width of a cut off drain**

 **-** Soil Type

 -Type of bedrock.

 - Expected volume if run off.

 **2x ½ =1mk**

1. **Two ways in which agriculture relates to industries**

**-**Agriculture provide raw materials for industries

-Agriculture provide market for industrial goods

-Agriculture provide food to industrial workers

 **2x1 mk**

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1. **Differentiate between soil texture and soil structure**

-Soil structure is the physical appearance of the soil according to the way the individual soil participates are arranged.

-While soil texture is the relative propohous of the various sizes of mineral particles in a samples

 of soil.

 **2x1 mk mark as a whole**.

1. **Give four advantages of tittle deed**

**-**Tittle deed can be used to secure credit facilities necessary for land development, hence

 Encouraging commercial farming.

-Since the registration confers security of tenure, any land disputes are minimized.

-Tenure security encourages farmers to invest in long term and permanent projects on their

 land and also care for the soil

-It enables the occupant to lease all the land or part of it and thus get extra income.

 **4x ½ = 2mks**

1. **a) Coagulation of solid particles**

- Aluminum sulphate **1 x ½ = ½**

**b) Softening of water**

 **-**Soda as (sodium carbonate)

1x1/2  **=** ½  **mks**

**c) Killing of pathogares**

 **-** Chlorine **1x ½ = ½**

1. **Reasons why green manure is not commonly used in agriculture production**

-It takes time for green manure crop to decompose and therefore planting is delayed.

-Moat of the crops grown are food crops and it is hard for people to use them as green manures.

-Green manures crops might use most of the soil moisture and leaves very little for the next

 Crop.

-Most of the nutrients are used by microorganisms in the process of decomposing the manure

 Plants. **4 x ½ =mks**

1. **Two effects of soil PH on crop production**

**-**Influence availability of various nutrients in the soil

-Influence activities and availability of micro-organism in the soil

-Determine the type of crop to grow

-determine presences of pest and diseases in the soil

 **2x1=2mks**

1. **Name 4 properties of soil influencing texture.**

-Aeration

-Drainage

-Chemical exchange

-Nutrient exchange

 **4x ½ =2mks**

**-3**

**b) Name 2 factors affecting rooting of cuttings**

 **-**Temperature

 -Light intensity

 -oxygen supply

 -leaf area

 -chemical treatment s

 **Any 2x1=1mk**

1. **Four reasons for timely planting of annual crops**

**-**Crop makes maximum use of rainfall and suitable soil temperature

-Crop escapes serious pest and disease attack.

-Ensure produce us marketed when price are high.

-Crop establish earlier than weed hence smoothing them.

 **4x ½ =2mks**

1. **Reasons for applying straight nitrogenous fertilizer to a crop of maize and height of 30-45 cm.**

-Maize has well developed roots, absorb dissolved nitrogenous fertilizers.

-Have leaves that are well developed to absorb foliar feed.

-Maize is growing fast and requires a lot of nitrogen

 **2 x ½ =1mks**

1. **Four disadvantages of non-capped multiple stem system in coffee production.**

-It requires less skill to establish

-Breaking of stem and branches.

-Difficulty in gathering the barriers from top points.

-Difficulty in spraying the full branches.

-Rotting of stumps with ages.

 **4 x ½ =2mks**

1. **Differences between thinning and rogueing**

**-**Uprooting the excess seedling to reduce competitions in the field while reguing is uprooting

 and destroying the infected plant to prevent spread of pest and diseases .

 **mark as a whole 1 mk**

1. **Importance of tissue culture.**

**-**It is used to ravel and establishes pathogen-free plant especially in the control of viral diseases

-It is used in the mass production of prop gules

-It is fast and requires less space than the cultural method of using cutting which require a

 biggest space.

 **2x ½ =1mk**

1. **Define the following terms as used in maize breeding**

**-(a) Hybrids-**Variety breed by crossing inbreed lines under conditions of controlled pollination

 **½ mk**

 **-(b) Composites-** Breed by growing a number of varieties together under controlled

 Pollination, there is free inter pollination. **½ mk**

**-4**

1. **Distinguish between integrated pest and management and economic injury.**

**-**Economic injury level is when pest population causes damage beyond tolerance while

 Integrated pest management is combination of both chemical and cultural pest control

 method. **Mark as whole 1mk**

1. **Three advantages of using pesticides**

**-**It is the most effective method

-Fast method of pest control

-results are more predictable

-less labour

 **3x ½**

1. **State how each of the following leads to loss of soil fertility.**

**-leaching:** Water infiltrates into the soil dissolving soluble minerals. Dissolved minerals are

 Carried to the lower horizons beyond the reach of many plant roots 1x ½ = **½ mk**

 **(b) Monocropping:-** the crop grown uses only that nutrient. It needs from a certain zone

 Where roots can reach making the soil infertile as far that crop is

 Concerned**. 1x ½ = ½ mk**

 **SECTION B (20MKS)**

1. **The method of irrigation shown below is**
2. Drip irrigation**(1x1) =1mk**

 **b) Disadvantages of drip irrigation**

 **-**Nozzles can blocked and this makes irrigation inefficient

 -Pipes can be broken during weeding or land preparation

 -It is an expensive undertaking e.g. buying pipes and laying them especially when

 irrigating large area

 **3x1=3**

1. **Amount of Nitrogen applied per ha is**

100kg CAN-------------21kgN

21kg is contained in 100kg CAN

300kg CAN supplies

 300kg CAN = 21kgN x300kg CAN

 100kg CAN

 = 63kgN/ha

1. **Method of layering.**

**A**: tip layering

**B:** compound layering **(2 mks)**

 **(b). Advantages of method B over**

It can produce several new planting n=materials from the same while A produce only one.

 **1mk**

**-5**

 **c) Other examples of layering method are:**

Aerial /marcotting layering

Trench layering **(2 x ½ =1mk**

1. **He method of soil sampling shown below is**

**-**Zigzag method /Reaction method

 **b) Precaution taken when collecting soil for sampling**

 -Avoid contaminating the soil samples

 -Do not collect the soil samples from unusual places

 -Collect samples at the correct depth.

 -Don’t mix this soil and sub-soil

 **2x1=2mks**

 **( c) Reasons for soil testing**

– To determine type of crop to be grown

 -To know the PHvalue of soilof the soil

 -to test the nutrients status of the soil

1. **The weed is** (a) couch grass/dietarian scalarum

b) The weed has an underground stem

 c . **Method of weed control**

 **-**mechanical (Acc any specific method)

 -cultural (Acc. Any

 -chemical method **2x1 =2mk.**

1. **Correctly planted cutting**

A **1 x½ = ½ mk.**

 **b) Reasons for your answer in a above**

The leaf does not touch the soil**. 1x1 =1mk**

 **SECTION C**

1. **Negative effect of land fragmentation and subdivision in Kenya.**

**-T**ime is wasted travelling from one holding to another from the farmstead to the various fragments.

**-**Proper and effective control of weeds and pest become difficult due to surrounding holding which might be neglected.

**-**Supervision of various units of land is made difficult since they are for apart

**-**Difficulties of offering agricultural extension advice hence difficult to help farmers to increase farm productivity.

**-**Difficult to control livestock parasites and diseases as they are transmitted as animal move from one field to another.

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**-**Difficulties of following sound farm plan may arise from the distance between fragments and farmers home.

**-**Leads to low agricultural productivity due to difficulty in supervision.

**-**Some land parcels may be inaccessibly by farm machinery.

**-**It may be difficult to restrict grazing in one holding only due to size and shape of a fragment leading to overstocking later lead to soil erosion.

**-**Difficulty in carrying out soil conservation measures especially if the neighbours don’t cooperate since run off water will flow from their farms to your farm. ( mark any 9 9x1=9mks)

**b. factors determining spacing of crops.**

use of the crop

-Closer spacing is practiced in crops grown for forage or silage supplying than for grain production.

Pest and diseases control

-Pests like aphids find it difficult to move from one place to another in properly spaced crop.

Growth habit of the crop

-Spreading and tilllering crop varieties require under spacing than erect type.

Moisture availability

-Areas with higher rainfall are capable of supporting a large number of plants hence closer spacing than areas of low rainfall.

Plant size

-Tall crop varieties requires wider spacing than short varieties. 6x1=6mks

C. Symptoms of viral infection in crops

Leaf chlorosis – it is mainly due to impairment of plants ability to synthesize chlorophyll

leaf curling

Resetting –it is the development of abnormally short internodes resulting in stunted plant.

-malformations of plant parts

-Mosaics – production of light green or yellow patches of various size and shapes which are irregularly distributed among green tissued e.g cassava

29. **Factors that encourages soil erosion (10mks)**

-It leaves the soil more or less unprotected against water erosion.

-Ploughing up and down making upper soil to move on the lower side of the slope.

-Planting of annual crops on steep slope leading to frequent cultivation hence atposure of soil to erosion.

-Indiscriminate burning of vegetation before cultivation leaving the land exposed to the erosion forces of rain and wind.

-Deforestation exposing the soil to both high temperature and heavy rainfall. Organic matter in the soil will be washed away by the surface runoff in to streams and rivers.

-Soil depth- shallow soils become saturated with water very quickly and are easily eroded.

-vegetation cover- if the soil is left bare, erosion will take place faster as compared to covered soil.

-Overstocking- it destroyed ground cover leaving the soil bare hence exposing it to erosion

-Soil type- sandy soils has coarse texture and becomes saturated with water quickly hence easily eroded compared to clay soil.

Topography (slope of the land)

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-Water flow of high spaced in steep slope compared to gentles slopes. The greater the water speed, the more the soil erosion.

-amount and intensity of the rainfall. Areas with heavy rainfall experience greater soil erosion than areas with less rainfall. This is because top soil becomes saturated easily during heavy rainfall than during little rainfall leading to runoff. (any 10x1= 10)

b**. Importance of Drainage**

- To increase soil erosion – drainage allows movement of air allowing plant roots get enough air for proper growth.

-To increase soil volume – amount of soil around the root zone from which root can easily get nutrients easily as increased.

-To raise soil temperature – it improves the rate at which soil warms up for better plant growth.

-To increase microbial activities- micro-organisms in the soil erosion in number due to proper aerathonisoil structure is improved and plant food is more ready available.

-To reduce soil erosion. Well drained soils have high water holding capacity which helps to reduce run off and increase infiltration rate.

-To remove tosixsubstances- through draining increased soil concentration in the soil are removed.

 5x1=5

c**. Cultural methods of diseases control**

 -Using healthy planting materials

-Use of resistant varieties e.g. Ruiru II in coffee

-Proper drying of cereals and pulses to recommended moisture content before storage

-Health treatment for example in the control of Raton stunting diseases in sugar canes.

-proper spacing to control damping off in cabbages seedlings in the nursery.

-proper seedbed preparation e.g. control of armillieria root rot in tea and coffee.

-Practicing field hygiene such as burning of diseased crop resistance using clean implements e.t.c

 **Any 5x1= 5mk**

 30. **Seedbed preparation**

 -Should be done early/during dry season.

 -Clear vegetation/remove stumps.

 -Do primary cultivation.

 -Harrow/secondary cultivation.

 -Prepare a clean seed bed/clear all perennial weed.

 -Make furrows/holes.

 -Seed bed should have medium.

 -Spacing should be filth.

 -Spacing should be 90cm 50cm between rows where cuttings are planted and 90cm 50cm

 between rows for splits.

 **5mks**

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**PLANTING;**

-Should be done at ONSET of rains/plant early/irrigation

 Should be done if necessary.

-Select desirable variety of Napier glass for ecological zone of the area.

-Planting materials used should be healthy.

- Place planting materials in holes/furrows using the recommended spacing.

-Cover the planting materials to any appropriate depth.

-Use cuttings or splits.

-Cuttings should be selected from mature canes/stems.

-Cuttings should have 3-5 nodes.

 **5MKS.**

-Fertilizer application.

-Apply phosphate fertilizer at recommended rate during planting.

-Top-dress nitrogen and potassium fertilizers 6-8 weeks after planting.

-Apply farm manure/compost manure before planting.

-Manure should be 7-8 tones in quality.

-Apply organic manure after harvesting and dig it in once a year.

 **4MKS**

-**Weed control**

 -By cultivation.

-Uprooting weeds.

-Slashing weeds.

-Use suitable herbicides.

-By interplanting with legumes that cover the ground e.g. macuna beans, disodium, introtum e.t.c.

-Control weeds early during establishment.

  **4mks**

**Utilization;**

-Practice zero grassing/cut and feed Napier grass to animals when proportion of leaf is higher than the stem.

-Cut down excess foliage to conserve as silage for later use.

-Avoid direct grazing of Napier grass.

 **2mks**