**LANET CLUSTER JOINT EXAMINATION (LANJET)- 2018**

**443/1**

**AGRICULTURE PAPER 1**

**MARKING SCHEME**

**SECTION A(30 MARKS)**

**1.Highlight two reasons for early land preparation (1 Mk)**

* To give time for weeds to dry and decompose
* To allow subsequent operations to take place

**2. Give two examples of Variable costs in the production of beans (1 ½)**

* Cost of pesticides
* Cost of seeds
* Cost of fertilizers
* Cost of casual laborers
* Cost of disease control

**3. What is the relationship between scarcity, preference and choice (2 mks)**

When the production resources are scarce, the farmer chooses to allocate the limited resources to enterprises he or she prefers.

**4. State two conditions under which the opportunity cost is zero or does not exist (1 mk)**

* When there is no alternative choice
* When the goods are unlimited in supply
* When the production resources are freely offered

**5. State four importance of raising tomato seedlings in a nursery bed (2 mks)**

* Excess seedlings can be sold
* Able to carry out management practices
* Makes it possible to transplant vigorously growing and healthy seedlings
* Enables production of many seedlings
* Reduces the maturity age of the tomatoes

**6.Give four factors that affect the ensiling process (2 mks)**

* Leaf stem ratio
* Extent of compaction
* Type of material used
* Maturity of the crop
* Moisture content of the material
* Addition of water

**7. Give two examples of Books of Accounts. (1 mk)**

* Ledger
* Inventory
* Cashbook
* Journal

**8. Give two reasons for imposing quarantine on imported planting materials (1Mk)**

* To control weeds
* To control pests
* To control disease spread

**9. Give three factors that may influence the price of an agricultural commodity. (1 1/2Mks)**

* Price of substitutes.
* Price expectations in future.
* Quality of the commodity
* Tastes and preference of the commodity.

**10. Name three examples of leguminous fodder crops. (1 1/2Mks)**

* Medicago sativa/Lucerne Leucaena
* Leucocephalal/calliondra.
* Artemisia annual/Artemisia.
* Calliandra /*calothyrsusl calliandra*
* Desmodium species

Kenya white clove/ *Infoliuim sempilosum*

**11. Give two factors that may determine the size of a pit for silage making (1Mk)**

* Quantity of forage available for ensiling.
* Number of animal to cater for.
* Length of the period of forage scarcity.
* Bulkiness of the material.

**12. Give three reasons for controlling weeds in pastures. (1 ½Mks)**

* To avoid poisoning of livestock.
* Minimize diseases spread.
* To ensure the forage is of high palatability.
* Minimize competition for nutrients, space light.
* To increase the life span of the pasture.

**13. State six characteristics of a productive soil. (3 mks)**

* Has appropriate depth.
* The right PH
* Good soil structure.
* Good water holding capacity.
* Well aerated/good drainage.
* Free from soil borne pests and diseases.
* Rich in nutrients in the right proportions.

**14.A member of young farmers club was advised to apply a complete fertilizer 30:**

**20:10 in a tomato plot measuring 10m long by 5m wide at the rate of 300kg per hectare**

1. **State the percentage of P205 in the complete fertilizer ( 1mk)**

P2 O5 = 20%

1. **Calculate the amount of fertilizer the member would require for the plot (2 mks)**

 **(Show your working)**

1 ha = 10,000M2 requires 300kg of fertilizer.

5m x 10m= 50M2 requires x of the fertilizer

 10,000 x = 300 x 50

X = 300x 50

10,000

X=1.5kgs

**15. State four ways of controlling bean anthracnose disease (2mks)**

* Use of certified seeds
* Use of appropriate fungicides/chemicals
* Crop rotations
* Use of resistant varieties
* Field hygiene/destruction of infected crop residues.
* Rogueing

**16. Apart from training and extension services, state four other agricultural support services the Kenyan government provides to a maize farmer. (2 marks)**

* Credit services
* Marketing services
* Agricultural machinery services
* Agricultural research services
* Farm input supply services

**17. List four sites on which agro forestry trees can be established on a farm (2 mks)**

* Farm boundaries
* Homestead
* Terraces
* River banks/water catchment areas
* Steep slopes/slopes
* Within pasture land between crop plots

**18. Give two forms in which nitrogen is absorbed from the soil by plants (1Mk)**

* Nitrate form/Nitrate ions/ NO-3
* Ammonium form/ammonium ions/ NH+4

**SECTION B (20 marks)**

**19.**

1. **Identify the weeds shown (4Mks)**

A……………………………..Double thorn (*Oxygonum sinuatum*)

B……………………………..Thorn apple (*Datura stramonium*)

C…………………………......Tick berry (*Lantana camara*)

D……………………………..Wandering jew(*Commelina benghalensis*)

1. **Give one economic importance of each one of the weeds (2Mks)**
2. Causes irritation to farm workers and livestock during grazing
3. It is poisonous to animals and human beings
4. **State the advantage of weed Con the farm (1 Mk)**
* Can be used as a live fence
1. **Why is weed D difficult to control (1Mk)**
* It is propagated vegetatively
* Its stems and leaves propagate vegetatively
* It has rhizomes which help it to propagate vegetatively

**20.**

**i) Identify the pest labeled C, D and E (3 Mks)**

**C**-Maize weevil

**D**-Bean weevil/Bruchid

**E**-Flour weevil

**ii) Give one reason why pest E is not controlled chemically (1 Mk)**

* To avoid contaminating flour with pesticides

**iii) State two non-chemical methods of controlling pest C and D (1 Mk)**

* Use of extreme/lethal temperatures in the storage structures
* Suffocation in the storage structures
* Radiation rays/electromagnetic radiation

**21.**

**a) State the aim of the experiment (1 Mk)**

* To compare porosity/drainage water holding capacity of different soil

**b) If the volume of water illustrated in the measuring cylinder was observed after one hour, identify the soil sample labeled A and B**

**Soil sample** A – Sandy soil (1Mk)

**Soil sample B**

* Loam soil ( 1 Mk)

**c) State one way in which the soil structure of the sample labeled C above can be improved (1 Mk)**

* Adding organic matter/manure
* Liming
* Sub soiling
* Draining away excess water (Any 1×1)

**22.**

1. **Identify the process (1 mk)**
* Nitrogen cycle
1. **Name the organism involved in the series represented by d (1 mk)**

**d-** Rhizobium spp (Symbiotic nitrogen fixing bacteria)

1. **Identify the processes represented by h and i ( 1mks)**
2. Absorption of nitrates by plant roots.
3. Nitrogen fixation by lightning

**SECTION** C (40marks)

**23 a).Describe the field production of dry beans under the following sub headings**

**i). Planting (5mks)**

* Time of sowing
* Timely planting should be observed.
* Before onset of heavy rains
* Early maturing planted in short rains
* Late maturing planted at start of long rains.
* Plant certified seeds.
* Innoculate seeds with nitrogen culture to boost nodulation
* Depth of planting 3-5 cm
* Spaced at 60 cm x15cm
* Apply phosphatic fertilizer at planting

**ii) Weed control (2mks)**

* The field should be kept weed free throughout thecrop growing period.
* First weeding is first carried out 2-3 weeks after emergence of the crop.
* Avoid weeding during the flowering stage so as not to knock down flowers

**iii) Harvesting (5mks)**

Harvest after 3-4 months

* Is done when all pods have turned brown or hard but before the pods start shattering away seeds.
* Small scale farmers usually harvest beans by uprooting whole plant.
* Dry the beans on bare earth, mats to a moisture content of 10% then dust with Actellic.
* Thresh and winnow to obtain clean bean seeds.

b) **Outline four problems associated with manure use in agricultural production (4 mks)**

* Bulkiness
* Spread of diseases/pests/weeds
* Laborious in application/transport
* Loss of nutrients due to poor storage
* Should be used if fully decomposed to avoid scorching crops ( 1×4mks ( first 4)

**c) Give four characteristics of plants suitable for green manure (4 mks)**

* Highly vegetative/leafy
* Fast growth rate
* Quick rotting/decomposition
* Hardy/ability to tolerate poor soil conditions
* High nitrogen content/legumes

**24a) Explain ten factors that can encourage soil erosion. (10marks)**

* Lack of ground cover exposes soil to agents of soil erosion/removal of cover crops
* Steep slopes increase the speed of surface run-offs hence erosive power of water
* Light/sandy soils are easily carried away by agents of soil erosion.
* Shallow soils are easily saturated with water and carried away
* High rainfall intensity on bare ground/leads at detachment of soil hence run off
* Frequent cultivation/over cultivation pulverizes the soil making it easy to detach and carry
* Away.
* Overstocking leads to overgrazing which destroys ground cover exposing it to agents of
* Erosion.
* Burning/deforestation destroys vegetation cover and exposes soil to agents of erosion.
* Ploughing up and down the slope creates channels which speed up and increases the erosive to agents of water.
* Cultivation of river banks destroys riverine (Riparian) vegetation & destroys soil structureexposing it to agents of erosion.
* Cultivating the soil when too dry destroys soil structure making it easy to be eroded.
* Long slopes increases volume speed of run off hence increasing erosive power of water.
* High rainfall amount increase saturation of soil hence increase in soil erosion.

**b) Describe the seven management practices that should be carried out on a vegetable nursery after sowing seeds until the seedlings are ready for transplanting. (7 marks)**

* Erection of shade to minimize evapotranspiration
* Weed control to reduce competition with seedlings for nutrients, light, space etc.
* Pest and disease control to ensure healthy and vigorously growing seedlings
* Pricking out/thinning to minimise competition for growth elements
* Fertilizer application to supplement nutrients in the soil
* Watering to ensure adequate moisture supply
* Hardening off/removing shade/reducing watering to acclimatize the seedling to conditions inthe field.
* Removal of mulch immediately after germination

**c) Describe the precautions that should be observed during the harvesting of pyrethrum. (3** marks)

* Picking starts after 3-4 months of planting to maintain quality
* Picked flowers are put in woven baskets to allow ventilation and avoid fermentation of flowers
* Wet flowers should not be picked because they heat up and ferment
* Picked flowers should, not be compacted to avoid heating up and fermenting.
* A suitable picking intervals maintained to avoid harvesting overblown flowers (3x1= 3 marks)

**25 a). Explain eight factors that should be considered when planning to set up a farm business.(8 marks)**

* Risk and uncertainties: enterprises should be analyzed to determine the risks and uncertaintiesinvolved.
* Security: enterprises which require more security should be sited near the farm house/provisionof adequate security
* Land size: a large number of enterprises can be established on a large scale compared to a small scale farm.
* Current trends in labor market: to determine availability and cost of labor especially duringpeak period.
* Farmers objectives and preferences: to ensure the farmer who is the operator has a sense ofownership of the plan and brings about motivation
* Current market trends and prices of outputs: to ensure consideration of enterprises with highprofits returns.
* Availability and cost of farm inputs: to identify enterprises that are affordable and whoseinputs are readily available.
* Government policy/regulation: to seek permission for enterprises undertaken on quotasystem e.g. coffee growing and avoid enterprises and farming systems prohibited by thegovernment
* Environmental factors: soil, climate and topography should be analyzed to determine livestockcrop enterprises that are suitable to the local ecological conditions.
* Communication and transport facilities and facilitate movement of outputs to the market andsupply of inputs. Also helps in conveying improved methods of farming and market trends.
* Availability of capital: to acquire farm inputs
* Possible production enterprises: should be identified and analyzed so that suitable andprofitable enterprises are selected

b)

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Liabilities** | **Shs** | **Cts** | **Assets** | **Shs** | **Cts** |
| **Current Liabilities** |  |  | **Current Assets** |  |  |
| KFS debt payable | 4500 | 00 | Cash at bank | 50000 |  |
| Unga Ltd debt payable | 5000 | 00 | KCC Debts receivable | 5000 |  |
| Wages payable | 12000 | 00 | Office equipment | 1400 |  |
|  |  |  | Tools in store | 10000 |  |
|  |  |  | Cattle feed in store | 4000 |  |
|  |  |  | Maize in store | 19000 |  |
|  |  |  | Seven mature sheep | 7000 |  |
|  |  |  | Calves  | 5000 |  |
|  |  |  | Dairy cattle | 55000 |  |
|  |  |  |  |  |  |
| **Long term liabilities** | 00 | 00 | **Fixed Assets** |  |  |
|  |  |  | Machinery | 4000 |  |
|  |  |  | Buildings | 126000 |  |
|  |  |  | Land | 260000 |  |
| **Total Liabilities** | 21500 | 00 | **Total Assets** | 556400 |  |
| **Net worth** | 534900 |  |  |  |  |
|  | 556400 |  |  | 556400 |  |