**NYANDARUA WEST CLUSTERS**

**EXAMINATIONS**

**July/August 2019**

**AGRICULTURE**

**MARKING SCHEME**

***SECTION A –(30 marks)***

***Answer all questions in this section in the spaces provided***

1. **Differentiate between Apiculture and Aquaculture**

* *Apiculture is bee keeping whereas Aquaculture is rearing of fish in fish ponds. (1 marks)*

*(****mark as a whole )***

1. **State any *four* methods of farming**

* *Shifting cultivation*
* *Nomadic pastoralism*
* *Organic farming*
* *Mixed farming Any 4 x ½ = 2 marks*
* *Agro forestry*

1. **Give two reasons for testing soil**

* *To determine soil PH/ type of fertilizer to apply*
* *To determine type of crop to grow*
* *To determine the nutrient content/amount of fertilizer to apply Any 2 x ½ = 1 marks*

1. **Define the following terms**

**(a) Nitrogen fixation**

* *Process in which atmospheric Nitrogen is converted to nitrates for plant uptake (1x1) (1mark)*

**(b) Phosphorus fixation**

* *Process in which phosphorus combines with other elements to form compounds that cannot be absorbed by plants (1x1) (1mark)*

1. **State *TWO effects* of HIV/Aids on agricultural production**

* *shortage of farm labour due to bad health*
* *Low supply of farm produce*
* *Low purchasing power to buy agricultural input/lack of capital*
* *Lack of motivation to invest in agriculture*
* *Less time is spent on farming activities Any 4 x ½ = 2 marks*

1. **State any *four* Reasons for organic farming**

* *Environmental friendly/no pollution*
* *It is sustainable/conserves soil*
* *Easy to carry out*
* *The produce fetch higher prices*
* *Materials used are easily available*
* *Produces healthy products Any 4 x ½ = 2 marks*

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

* *Soil structure is the physical arrangement of soil particles and how they adhere to each other to*

*form an aggregate where as soil texture is the relative proportion of various sizes of mineral*

*particles in the soil (1 mark) Mark as a whole*

1. **State any *four* examples of working capital**

* *Fertilizer*
* *Seeds*
* *Fuel*
* *Pesticides/herbicides 4 x ½ = 2 marks*

1. **What is Land reform?**

* *It is specific integrated action/programme to bring about more effective control a nd use*

*of land/ an organized action taken to improve the structure of land tenure and land use.*

*(1 mark) Mark as a whole*

**(b) State any *four* methods of land reform**

* *Land tenancy/land ownership reforms*
* *Land consolidation’*
* *and sub-division/demarcation*
* *land adjudication and registration*
* *settlement*
* *Resettlement 4 x ½ = 2 marks*

1. **State any *four* ways of making land productive**

* *Addition of organic matter*
* *Application of fertilizers/soil amendment*
* *Irrigation*
* *Drainage*
* *control weeds 4 x ½ = 2 marks*
* *Soil and water conservation*

1. **Distinguish between the following**

**(a) Fixed input and variable input**

* *Fixed input is a resource/factor of production in which quantities required do not vary or change*

*with level of production where as variable input is a resource/factor of production in which quantities required vary or change with level of production*  ***(mark as a whole – 1 mark)***

**(b) Journal and ledger book**

* *Journal is a financial book in which daily farm transactions are entered or recorded as they occur while ledger book is a book of accounts in which the entries contained in all the other books of accounts are entered or recorded (****mark as a whole – 1 mark)***

1. **Differentiate between staking and propping in crop production**

* *Staking is providing support to weak stemmed/climbing plants whereas*
* *Propping is supporting heavy fruits from overweighing the stem in certain plants like bananas. 2 x 1 = 2 marks*

1. **Give four conditions of land which may make it necessary to carry out reclamation practices**

* *Swampy/water logged areas*
* *Stormy grounds*
* *Aridity/dryness*
* *Eroded/bare land*
* *Tse tse infested areas*
* *Bushy land. 4 x ½ = 2 marks*

1. **Name a*ny two* physical weathering agents in the soil formation process**

* *Wind*
* *Glaciations/ice*
* *Temperature*
* *Running water(reject water alone) 2 x½ = 1 mark*

1. **State t*wo* Mechanical methods of separating soil particles according to size during soil analysis.**

* *Mixing soil with water, shaking and allowing particles to settle/sedimentation*
* *Use of a series of sieves with different mesh sizes/sieve method 2x ½ = 1 mark*

1. **State *four* functions of Boron in crop development**

* *Assist the development of meristematic tissues*
* *Facilitates fruit setting*
* *Helps in translocation of sugars. Nitrogen and phosphorus*
* *Facilitate nodule formation in legume*
* *Facilitate the absorption of water*
* *Facilitate the formation of pollen tube. 4 x ½ = 2 marks*

1. **State f*our* factors that should be considered when classifying crop pests**

* *Where pest is found/field/storage*
* *Feeding habits/type of damage*
* *Scientific/biological classification*
* *Crop attacked*
* *stage of growth of the crop attacked*
* *Stage of development of the pest at which it causes damage*
* *Part of the crop attacked 4 x ½ = 2 marks*

***SECTION B – (20 Marks)***

***Answer All Questions In This Section***

1. **Different soil samples were tested and their pH values tabulated as shown below**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Soil sample | P1 | P2 | P3 | P4 | P5 | P6 | P7 | P8 |
| pH value | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 |

**(i) Which soil sample had the highest acidity?**

* *sample P1 (1 mark)*

**ii) Which soil is suitable for growing coffee ?**

* *sample P2 / P3 (1 mark)*

**iii) How would pH of soil sample P1 be increased?**

* + *by adding lime (1 mark)*

**iv) How would pH value of soil sample P8 be reduced?**

* + *by applying acid forming fertilizer e.g. sulphate of ammonia (1 mark)*

1. ***(a)* State the four cardinal questions a farm manager formulates when preparing a partial budget**

* *What extra cost is to be incurred as a result of the proposed change?*
* *What revenue is to be foregone as a result of the proposed change?*
* *What extra revenue is to be earned from the proposed change?*
* *What costs are to be saved as a result of the proposed change? (4 x ½ = 2 marks)*

***(b)* A farmer has 160 ha of arable land, 60ha of which is under wheat, 32ha under maize, 12ha under fodder crops and the rest under pasture. She wishes to know whether replacing 12 ha of maize with Irish potatoes in the following year would be worthwhile. The fertilizer rate would have to be increased from 5 bags per ha for maize to 7 bags per ha for Irish potatoes and an extra 100 man-days of casual labour per ha will be necessary as a result of the change. The average yield of maize and Irish Potatoes is 45 and 115 bags/ha respectively. The prices are Shs. 1,400 per bag for maize and Shs. 1,200 per bag for Irish potatoes. Seed costs are Shs. 2,500 per ha for maize and Shs. 30,000 per ha for Irish potatoes. Fertilizer costs are Shs. 1,300 per bag. Labour is paid Shs. 150 per man-day.**

**Draw up a partial budget and indicate the effect of the change**.

*Partial Budget*

|  |  |
| --- | --- |
| *DEBIT (-)* | *CREDIT (+)* |
| 1. ***Extra costs***   *Potatoes*   1. *Fertilizer - 7x12x1,300= Shs. 109,200* ***(½mark****)* 2. *Labour – 100x12x150 = Shs.180,000* ***(½mark****)* 3. *Seed – 30,000 x12 = Shs 360,000* ***(½mark****)*   *Shs 649,200 .*   1. ***Revenue foregone*** 2. *Maize Yields - 45x12x1,400 = shs 756,000*   ***(½mark****)*  *Extra Cost + Revenue foregone*  *= Shs 1,405,200* ***(½mark****)* | 1. *Extra Revenue*   *Potatoes Yield: 115x12x1,200= shs 1,656,000*  ***(½mark****)*   1. *Costs Saved* 2. *Maize seed: 12x2,500 = shs 30,000* ***(½mark****)* 3. *Fertilizer 15x12x1,300 = shs 108,000* ***(½mark****)*   *Shs 138,000 .*  *Extra revenue + costs Saved*  *= Shs. 1,794,000* ***(½mark****)* |

*Therefore (extra revenue + cost saved) – (extra cost + revenue foregone)*

*Shs 1,794,000 - Shs 1,405,200 = Shs 388,800* ***(½mark****)*

* *This indicates a profit* ***(½mark****)*
* *Therefore the change is worthwhile* ***(½mark****)*

1. **A Farmer in Ol Joro-orok was adviced to plant maize at a spacing of 100cm by 50cm in his one hectare piece of land** 
   1. **Calculate the plant population in his maize field. (*show your working*).**
   * *Plant population = Area of Land √(½Mark)*

*Crop spacing*

*= (100 x 100 x 100 x 100)cm2 √(½Mark)*

*(100x 50) cm2*

*= 20,000 plants (1 Mark)*

* 1. **Give two undesirable effects of high population density in a field of maize grown for grains**
  + *It induces lodging*
  + *It is difficult to carry out operations such as weeding.*
  + *Reduces yield per unit area*
  + *Low quality/small sized grains are produced. (any 2 x 1 = 2 Marks)*

1. **A maize pest is shown in the diagram below. Study them and answer questions that follow**



1. **Identify the pests in the diagram** 
   * *Maize weevil P(1 mark)*
2. **At what stage of maize production does the pest damage the crop** 
   * *Mature Stage*
   * *Storage (1 mark)*
3. **Give two ways of controlling the pest.**

* *Dry grains to a low moisture content (11-13% MC) before storage*
* *Dust maize grains using suitable pesticides eg. Actellic Super, Spindar dust etc.*
* *Keep grains in a clean store (any 2 x 1 = 2 marks)*

***SECTION C - (40 Marks)***

***Answer any two questions in the spaces provided after question*** 24.

1. **a) Describe the production of dry beans under the following sub-headings.**
2. **Land preparation**

* *Should be done early during the dry season*
* *Clear the land*
* *Plough deeply to eradicate all weeds*
* *Carry out secondary cultivation to obtain a medium tilth. (3 x 1 =3 marks)*

1. **Field management practices**

* *Control weeds before the flowering stage when weather is dry to avoid spread of diseases*
* *Control pest using appropriate methods*
* *Control diseases using appropriate methods*
* *Irrigate when necessary (4x 1 =4 marks)*

**b) Describe harmful effects of weeds on crop production**

* *Lower quality of farm produce*
* *Compete for nutrients with desired crops*
* *Acts as alternate host for pest and diseases*
* *Irritation*
* *Increases cost of production*
* *Some weeds are poisonous to animals*
* *Block irrigation channels*
* *Some are allelopathic.*
* *Some block navigation and fishing (8x 1 =8marks)*

**c) Describe the importance of Agroforestry**

* *Source of wood/fuel/fodder/fruits/timber*
* *Aesthetic value*
* *Source of income from sales of poles/timber*
* *Trees serve as windbreaks*
* *Trees control soil erosion*
* *Labour saving on fetching firewood. (any 5x 1 =5marks)*

1. **(a) Outline factors necessary for proper functioning of farmers co-operative societies in Kenya.**

* *Availability of funds/capital*
* *Training of personnel*
* *Loyalty on the part of all farmers, co-operative officials to support their organization*
* *Proper and accurate record keeping and accountability for all operations.*
* *Timely payment of farmers*
* *Honesty on the part of personnel with regard to handling of co-operative finances*

*(Any 5 x 1 = 5 Marks)*

**(b) Explain how farmers overcome risks and uncertainties in a farming business**

* *Diversification – growing various crops, enterprises so that if one fails the farmer has something to rely on*
* *Insurance against loses*
* *Inventory marketing/strategic farming.*
* *Flexible enterprises*
* *Rationing of input*
* *Using more certain husbandry practices*
* *Contract marketing*
* *selecting certain enterprises*
* *Maintain liquidity*
* *Adopt modern methods*

*(Any 7 x 1 = 7 Marks)*

1. **Describe steps farmers’ should follow when planning a farm business.**

* *Determination of farm size*
* *Determination of environmental conditions*
* *Determination of farmers preferences/objectives*
* *Determination of all available resources to the farmer in order to establish his abilities and limitations.*
* *Determination of alternative budget translating physical plan into financial one.*
* *Determination of possible production enterprises.*
* *Determination of yields of various enterprises*
* *Development of financial flow inorder to establish capital requirement*
* *Examination of the plan to ensure that its workable, consistent and desirable.*
* *Determination of Government policies and regulations to make the plan realistic.*
* *Determination of existing market conditions and price trends.*

*(Any 8 x 1 = 8 Marks)*

1. **Discuss the importance of irrigation in farming**

* *Makes it possible for crops to be produced during dry season*
* *Makes it possible to reclaim land for agriculture production*
* *Sustain proper growth of crops which require plenty of water*
* *Supplement rainfall in crop production*
* *Creates favourable temperature for proper plant growth*
* *Facilitates supply of fertilizer in irrigation on water*
* *Makes it possible to grow crops in specialized structures e.g. green houses or propagation units.*

*(Any 6 x 2 = 12 marks)*

**(b) State the factors that influence the type of irrigation to be used in a farm**

* *Nature of land/topography*
* *Type of soil*
* *Availability/amount of water used*
* *Type of crop to be irrigated*
* *Distance of the water source from field*
* *Technology available*
* *Cost of the system to be used*
* *Climate of the area*
* *Availability of skilled human power.*

*(Any 8 x 1 = 8 marks)*