**JINJA JOINT EXAMINATION BOARD**

**P515/2**

**UGANDA ADVANCED CERTIFICATE OF EDUCATION**

**PRINCIPLES AND PRACTICES OF AGRICULTURE.**

**MARKING GUIDE 2019**

1. Mean surface area for

**=18.75 = 18.8cm2**

Mean surface area of

**Award 1 mark for the formula and1 for the answer.**

(b).(i). Reason for the differences in the mean surface area between the leaves from two sites

* The amount of light intensity the leaves receive

***Award 2 marks = 2x1 = 2 marks***

(ii). **Explanation for the reason in (b) i) above**

* Leaves from the maize plant in the shaded site receive light of low intensity and therefore need to have a large surface area for maximum absorption of light by Chlorophyll.
* Leaves from the maize plant in the open site receive light of high intensity and therefore do not need to have a large surface area for optimum absorption of light.

***Award 2 marks for 2 explanations 2x2 = 4 marks***

(c). Rolled leaves reduce the surface area of the leaf that is exposed thus reducing the rate of transpiration hence the plant loses less water

***Award 2marks for correct explanations 2x1 = 2 marks***

(d). **Describe the field practices that would ensure high yields of maize**

* Early planting to enable crops escape drought, pests and benefit from nitrogen flush
* Timely seedbed preparation, this allows organic matter to break down and early planting
* Recommended spacing, to avoid competition for growth factors and control diseases
* Fertilizers/ manure application to enrich the soil with nutrients so as to have vigorous growth
* Weeding, to reduce competition for growth factors between crops and weeds
* Pests and disease control, to reduce losses due to their attack
* Planting at correct depth to ensure uniform germination, maturation and harvest
* Timely harvesting, to reduce field losses by pests
* Irrigation when necessary to ensure adequate supply of moisture
* Staking to reduce lodging, pest and disease attack
* Gapping to ensure correct plant population
* Proper seedbed preparation, to encourage faster establishment of the crop

***Award 1 mark for 8points***

***1/2 mark for mention, 1/2 mark for explanation***

***1 x 8= 8marks***

1. (a). **Characteristics of vegetable seedlings raised under too much shade**

* Their stems are exceptionally long (etiolated)
* The seedlings have too much hair
* The seedlings have too long internodes
* The seedlings are very weak when transplanted
* Their leaves are reduced in size
* Their stems are slender
* Their leaves turn to pale yellow

***Award 1 mark for 4 points***

***1x4 = 4 marks***

(b). **Care taken when transplanting tomato seedlings.**

* Transplant in the evening or on a cloudy day
* Water the nursery bed a few hours before transplanting to soften the soil
* Put the seedlings in the hole and firm it with soil
* Water immediately after transplanting
* Spray the seedlings with recommended pesticides
* Construct a shade onto the seedlings after transplanting
* Scoop the soil with some soil

***Award 1 mark for 6 points***

***1x 6 = 6 marks***

(c). **Describe how a good nursery bed for tomatoes is made**

* Choose the site
* Clear the site off the vegetation
* Carryout deep ploughing to remove all the weeds
* Break the big clods into small particles
* Rake to remove the stones and other foreign materials
* Raise the soil
* Sterilize the bed by pouring hot water or burning dry grass on the surface
* Add organic manure/fertilizer
* Rake to mix manure and to level
* Make a bed of 1 metre to any length
* Construct a shade over the bed
* Establish an enclosure/ fence around the bed

***Award 1 marks for 10 points logically presented***

***1x 10 = 10 marks***

1. (a). **Soil structure**, is the overall arrangement of soil particles in a given soil / the way individual soil particles are aggregated

(OWTTE)

***Award 2 marks 2 x 1 = 2 marks***

**(b). Factors that influence the development of the different soil structures.**

* Soil forming processes e.g. exfoliation leads to development of prismatic structure
* Presence of organic matter, this stabilizes the soil structure e.g. in the crumb structure
* Physical and chemical nature of the parent rock and its resistance to agents of soil formation
* Climatic factors such as rainfall, temperature and wind causes soil aggregates to swell or shrink e.g. granular and crumb structure
* Vegetation cover e.g. plants with abundant fibrous roots make soil structure more porous.
* Degree of cultivation, over cultivation destroys the soil structure resulting into granular structure
* Living organisms that borrow into the soil improve porosity and help in the decomposition of organic matter.

***Award 2 marks for 5 points explained points***

***2 x 5 = 10 marks***

(c)(i). **How fine textured soil influence plant growth?**

* Their high holding capacity makes them prone to water logging making it unsuitable for growth of most crops
* Fine textured soils have poor heat transfer due to low porosity, hence they remain cold and unsuitable for soil organisms’ activities and proper root development
* When cultivated during wet season, they become sticky and in dry season they are hard to cultivate
* Since organisms are in unfavourable conditions, organic matter remain decomposed so nutrients are not released for crop use
* They have poor aeration thus plant roots and soil organism would not be able to respire
* Due to poor aeration also carbondioxide will build up to toxic levels hence lowering organic matter decomposition to release nutrients for plant growth

***Award 1 marks for 4 points***

***1 x 4 = 4 marks***

(ii). **Ways farmers can make sandy soils more suitable for plant growth**

* Application of lime to reduce acidity and aggregate soil particles so that they hold more water
* Marling with clay soils to get soil with intermediate characteristics
* Application of artificial fertilizers to increase the level of nutrients
* Use of sprinkle irrigation to supply enough water to the crops
* Application of organic matter to increase water holding capacity, reducing leaching, increase availability of nutrients and increase activities of micro-organisms.

***Award 1 marks for 4 points***

***1 x 4 = 4 marks***

1. (a)(i). **Culling** refers to the picking and removal of unproductive birds from the flock for slaughter or sale

***Award 2 marks,***

***2 x 1 = 2 marks***

(ii). **Brooding**, this is the special care and management given to chicks from the time they are hatched up to about 4-6 weeks old

***Award 2 marks,***

***2 x 1 = 2 marks***

(iii). **Incubation**, is the embryonic development of a fertile egg to form a chick

**(OWTTE- Other words to that effect)**

***Award 2 marks,***

***2 x 1 = 2 marks***

(b). **Conditions necessary for proper hatching of eggs.**

* Regular turning of eggs so that the developing embryo does not stick to one side
* Providing eggs with optimum humidity/ adequate humidity to avoid excessive loss of moisture from the egg contents
* Provision of good ventilation to enable free circulation of air around the eggs
* Use of fertile eggs for incubation to increase chances of hatching
* Incubating eggs in a hygienic environment free from parasites and diseases so that they are not passed on to the developing chick
* Providing layers with balanced rations or nutrients feeds. E.g. inadequate zinc in layers diet greatly reduces hatchability

***Award 2 marks for 5 points,***

***2 x 5 = 10 marks***

(c). **Precautions taken when feeding greens to poultry birds.**

* Withered greens should be avoided since they are difficult to digest
* Avoid feeding wet greens to birds
* Green feeds should be clean and free from dust
* Greens should be tender and fresh
* Avoid feeding poisonous plants to birds
* Avoid rotting greens in the poultry house
* Greens should not exceed 20% of the daily ration.

***Award 1 marks for 5 points,***

***5 x 1 = 5 marks***

1. (a). **Milk letdown**; is the flow of milk from alveoli into the gland cistern and teat cistern following stimulation of the animal.

***Award 2 marks***

***2 x 1 = 2 marks***

(b). **Factors that affect milk composition in dairy cattle**

* Age of milking animal
* Breed of the animal
* Diseases such as mastitis make milk contain blood clots and pus
* Stage of pregnancy
* Season of the year
* Frequency of milking
* Heat periods/ oestrus increase butter fat content
* Use of drugs change composition, flavour and smell of milk
* Temperament of the animal
* Stage of lactation
* Types of feeds

***Award 11/2 marks for 6 points***

***11/2 x 6 = 6 marks***

***½ mention, 1 mark for explanation***

(c). **Ways of ensuring production of high quality of milk on the farm**

* Grooming of the animal before milking
* Keeping the milking animal healthy
* First use of strip cup before actual milking to detect mastitis
* Washing the udder and teats with warm water to remove dirt and dust and stimulate letdown
* Remove all plants with a strong smell around the milking parlour
* Do not feed animal on silage before and during milking
* Milking utensils should be washed clean and disinfected every after use
* Keep milking parlour clean and free from flies
* The milker should cover his head with a cap to prevent hair falling into the milk
* Smear teats with milking salve before milking to control cracking of teats that would lead to injection
* Diseased animals should be milked last and their milk poured away
* Filtering of milk to remove any foreign material
* Keep milk covered to avoid dust or flies to fall in.

***Award 1 marks for 9 points***

***1x9 = 9 marks***

1. (a). **Pre-requisites for agricultural mechanization**

before mechanization is introduced in a place, the following should be considered

* Educate farmers on the benefits of mechanization through seminars and establishment of demonstration farms
* Encourage co-operative ownership of machines to enable the farmers share overhead costs
* Give farmers loans to enable them purchase and maintain machines
* Develop simpler and more affordable machines
* Train more farmers on how to operate and maintain machines
* Establish engineering workshops to enable farmers acquire some skills
* The land tenure system should be changed since most farmers have small land holdings.
* Creating sustainable market for products.

***Award 1 marks for 6 points***

***1x6 = 6 marks***

(b). **Factors that influence the choice of tillage implement for cultivation**

* Soil condition, dry or hard soils require heavy implements like disc plough
* Type of the soil, sandy soils/ light soils are easily cultivated by hand hoe or ox-plough whereas heavy soils like clay may require disc plough.
* Topography. In hilly areas, tractor drawn implements may not be used whereas flat land hand hoes may be used
* Nature of vegetation, Ox-plough is used in areas with short vegetation while a disc plough can be used in areas of tall and thick vegetation
* Size of land, where land is small, it calls for use of simple tools like hand hoes whereas in areas with large piece of land tractor drawn implements can be used.
* Condition of the field, fields with many obstacles such as tree stumps requires a disc plough where fields without obstacles require a mould board
* Availability of required skills, farmers choose implements that they can operate easily.
* Availability of capital. Farmers with more capital can afford expensive implements while those with less capital can afford simple and less expensive implements.
* Durability/ strength of the implement. Durable implements ate preferred by most farmers compared to those which are not durable
* Availability of spare parts, farmers can only choose implements with easy access to spare parts
* Efficiency of the implement, farmers prefer implements that are efficient in performing farm work

(c). **Objectives of tilling land**

* To kill weeds in the field
* To breakup soil to enable easy water penetration
* To breakup soil to enable easy air circulation
* To facilitate planting of crops
* To burry vegetation so that they rot to form manure
* To encourage easy root penetration
* To facilitate germination
* To expose crop pests and their eggs
* To kill pests by burying them, they suffocate and die
* To increase activities of micro-organisms in the soil
* ***Award 1 marks for 5 points***
* ***1x5 = 5 marks***

1. **(a)Feature of a good roofing material**

* Provide some resistance against fire
* Should be light in weight with ability to support certain loads placed over it
* Should offer resistance against penetration by rain and dust
* Should have ability to significantly insult sound and heat
* Should withstand the effects of wind both suction and pressure efforts
* ***Award 1 marks for 4 points***
* ***1x4 = 4 marks***

(b).**Factors considered when selecting roofing materials**

* Cost of roofing material
* Availability of the roofing material
* Type of building/ structure/ type of construction
* Availability of skilled labour
* Ease of use of the roofing material
* Attractiveness of the roofing material
* Farmers preference
* Income/capital of the farmer
* Versatility / flexibility of the material
* Portability of the roofing material
* Durability/ strength of the material

***Award 1 marks for 10 points***

***1x10 = 10 marks***

(c). **Reasons why tiles are more preferred over other roofing materials**

* They are easy to fit/fix onto the roofing framework
* They are heavy thus reducing chances of being lifted by wind and stormy rainfall
* When well fitted, they are adequately water proof
* Tiles offer sound thermal insulation properties
* They are long lasting than other materials e.g. thatch
* They carry low maintenance costs once they are well installed on a good roofing framework.

***Award 1 marks for 6 points***

***1x6 = 6 marks***

1. (a). **Optimum population,**This is when the total number of individuals is just enough to effectively utilize the available resources without straining them

(OWTTE)

***Award 2 marks***

***2x1 = 2 marks***

(b). **Causes of low food production in Uganda**

* Negative attitude towards farming
* Pests that destroy crops and reduce yields
* Drought conditions that destroys crops and reduce yields.
* Infertile soils that do not allow proper plant growth
* Inadequate land for agriculture where farmers have small plots/ land fragmentation
* Poor farming methods that are used leads to low yields
* Low level of mechanization leading to delayed farm practices and less acreage
* Effects of natural hazards like floods which destroy crop leading to low yields.
* Animal diseases that reduce production
* Crop diseases that destroys crops leading to low yields
* Poor crop varieties grown which gives low yields
* Inadequate capital which make farmers not able to practice large scale farming
* Traditional beliefs where some farmers do not grow particular crops or do not rear certain types of animals
* Insecurity in some parts of Uganda where farmers can not settle on their agricultural activities
* Poor farming methods used which leads to low yields
* Low level of education

***Award 1 marks for 12 points***

***1x12 = 12 marks***

(c). **How agricultural research centre in Uganda have contributed to increased food production?**

* Testing new crop varieties and certifying them for farmers
* Finding treatment for livestock diseases
* Evaluating chemicals to be used on the farm to control weeds, pests and diseases
* Improving on breeds of animals through cross breeding
* Finding the best control measures for pests
* Soil testing to recommend the necessary fertilizer to use
* Improvement of existing crop varieties
* Development of new crop varieties through research

***Award 1 marks for 6 points***

***1x6 = 6 marks***

1. (a). **Agricultural development**, is the transformation of agriculture from traditional subsistence farming to commercial agriculture Or it refers to the transformation of agriculture from low productivity to high productivity.

***Award 2 marks, 2 x 1= 2 marks***

***(***b). **Roles of each of the following in agricultural development**

1. **NAADS**

* To provide technical and specialized advisory services to farmers
* To mobilize farmers into small groups for easy training and assistance
* To provide farming inputs to farmers at local levels
* To promote cross cutting issues in agriculture like gender, poverty, HIV/AIDs
* To promote use of improved techniques in agriculture.

***Award 1 marks for 5 points***

***1x5 = 5 marks***

1. **NARO**

* To publish research information relevant to farmers
* To identify the needs and challenges affecting agriculture sector
* To develop new crop varieties and breeds of animals for agriculture.
* To promote formulation of policies and programmes in agriculture
* To test new technology and monitor new innovations in agriculture
* To advise the government on the programmes in agriculture sector

***Award 1 marks for 5 points***

***1x5 = 5 marks***

(c). **Measures that can be adopted to improve the efficiency and effectiveness of the NAADs programme in Uganda**

* The government should provide subsides to the farmers in order to motivate them in their agriculture activities
* More extension workers should be employed in order to teach farmers new technologies
* More demonstration farms should be set up which should act as learning sites for farmers
* The government should improve on infrastructures such as roads to ease transport and communication between farmers and extension workers
* The government should provide motorcycles to extension workers so as to be in position to reach most of the farmers in their respective sub counties
* There should be strict laws on corruption to discourage the vice
* Sensitization about the importance of attending NAADS meetings
* Encourage farmers to carryout co-operative farming so as to reduce the costs of production
* Retooling extension workers with new skills related to the recent technologies
* The government should open up new markets to absorb the likely increase of produce due to NAADS intervention.
* The government should pay extension workers on time and above all relatively good pay so as to motivate them.

***Award 1 marks for 8 points***

***1x8 = 8 marks***

**END**