**Name:..............................................................................................**

**Signature:..................................................................... School:......................................................**

**MARKING GUIDE**

**527/1**

**PRINCIPLES AND**

**PRACTICES OF AGRICULTURE**

**(Theory Paper)**

**July / Aug. 2016**

**2½ hours**



**UGANDA TEACHERS’ EDUCATION CONSULT (UTEC)**

**Uganda Certificate of Education**

**PRINCIPLES AND PRACTICES OF AGRICULTURE**

(THEORY)

**Paper 1**

**2 hours 30 minutes**

**INSTRUCTIONS TO CANDIDATES:**

*Answer* **all** *the questions in Part* ***A*** *and* ***four*** *questions from part* ***B*** *choosing at least* ***one*** *question from each section.*

*Extra questions attempted will* **not** *be marked.*

|  |  |  |
| --- | --- | --- |
| ***For Examiner's Use Only*** | | |
| ***Part/Question*** | ***Marks*** | ***Examiner's Signature And Number*** |
| **A** |  |  |
| **B: No.** |  |  |
| **No.** |  |  |
| **No.** |  |  |
| **No.** |  |  |
| **Total** |  |  |

**PART A (20 Marks)**

*Answer* ***ALL****questionsin this part. For questions* ***1,*** *write the letter corresponding to the best answer in the box provided.*

*For questions* ***2*** *to****5,*** *write* ***all*** *answers in the spaces provided.*

1. (a) Which one of the following is **NOT** a risk in farming?  *(02 marks)*
2. Fire outbreak

**B**

1. Price changes
2. Death of a farmer
3. Theft of livestock

(b) Use of animal power in south western parts of Uganda is limited by;

A. Topography

**A**

B. Absence of cattle

C. Limited skills in farming

D. Poor soil structure

1. The following are viral diseases in livestock **except;**
2. Nairobi sheep disease

**D**

1. Swine fever
2. New castle
3. Heart water
4. The planting depth of any crop seed is influenced by;
5. Soil moisture
6. Seed size

**B**

1. Soil depth
2. Seed viability
3. (a) Give **four** advantages of deep litter system of poultry farming. *(04 marks)*

* *Birds are well protected from predators /thieves*
* *Collection of eggs and feeding of birds is easy*
* *Its easy to monitor birds for poor health and feeding*
* *Keeping records about bird production is easy*
* *Its easy to control bird parasite and disease out break*
* *Ensures production of high quality chicken manure*
* *Large numbers of birds can be kept in a small area.*
* *Production is relatively high*
* *Easy to isolate sick birds*

***Any 4 points 1 mark@ 4 x 1 = 4 marks***

(b) What are the characteristics of good egg for consumption? *(02 marks)*

* *It should have a good smell*
* *It should be clean*
* *It should be big enough in size*
* *Should have a thick shell*
* *Should be free from abnormalities*
* *Should have a good shape*
* *The shell should be of a good colour*

***Any four points ½@ 4 x ½ = 2 marks***

1. State the main causes of disease in crops.  *(03 marks)*

Bacteria

* *Micro organisms or pathogens Fungi*
* *Nutritional imbalances Virus*
* *Inheritance of diseases*
* *Environmental pollution*
* *Inadequate light received by crops*
* *Extreme environmental temperatures*

***Any 3 points 1 mark@ 3 x 1 = 3 marks***

1. (a) Mention **six** qualities of a good lubricant.  *(03 marks)*

* *Should have low viscosity*
* *Should have a high flash point (point at which explosion )*
* *Have a low pour point (Ability to pour)*
* *Should have a good body (should be thick enough)*
* *Should be able to resist pressure (good film strength)*
* *Should have cleaning detergent*
* *Should be smooth and slippery, oily*

***Any six points ½ mark @ 6 x ½ = 3 marks***

(b) Outline the sources of engine oil contamination. *(03 marks)*

* *Dust that enters through air cleaner*
* *Product of fuel combustion, carbon*
* *Metallic particles*
* *Unburnt fuel*
* *Moisture from condensation*
* *Acids from oil decomposition*
* *Soot from fuel combustion*
* *Sludge.*

***Any 3 points 1 mark@ 3 x 1 = 3 marks***

1. What are the characteristics of agriculture products? Give six. *(03 marks)*

* *Have divergent production*
* *Have cheap synthetic substitutes*
* *Have inelastic demand*
* *Are perishable*
* *Are seasonal*
* *Are of mixed quality / low quality*
* *Are bulky*
* *Have long gestation period*
* *Are produced by a large number of small scale producers.*

***Any 6 points ½ mark @ 6 x ½ = 3 mark***

**PART B (80 MARKS)**

**SECTION I**

**CROP PRODUCTION**

1. (a) Explain the factors affecting soil fertility.  *(14 marks)*

* *Weeds*
* *Soil structure - soils with good structure conserve enough moisture and that support fertility.*
* *Soil depth – deep soils conserve enough moisture for crops to use*
* *Soil aeration – well aerated soils encourage activities of soil organisms that decompose organic materials to improve fertility*
* *Soil drainage – soils with good drainage encourage activities of soil living organisms as well as improve soil physical properties*
* *Level of organic matter – soils with high organic matter are fertile hence good for crops*
* *Soil pH . the pH of soil determines availability of crop nutrients hence fertility*
* *Level of pollution – high levels of soil pollution reduces soil fertility by limiting activities of soil organisms and reducing water infiltration*
* *Accumulation of pests and diseases – soils with high numbers of pests and diseases cannot support crop growth*
* *Presence of hard pans – presence of hard pans reduces water infiltration, crop root growth and establishment hence affecting soil fertility*
* *Nutrient content*
* *Water holding capacity*
* *Soil texture*

***Any 7 points 1 mark mention***

***1 mark explanation 7 x 2 = 14 marks***

(b) Give the farming practices that improve soil fertility.  *(06 marks)*

* *Mulching using organic materials*
* *Crop rotation*
* *Bush fallowing*
* *Application of manures or fertilizers*
* *Liming soil*
* *Improving soil drainage*
* *Control of pests and diseases*
* *Crop rotation*
* *Drainage of excess water*
* *Irrigation*
* *Minimum tillage*
* *Cover cropping*
* *Ley farming*
* *Agro-forestry*

1. (a) Outline the characteristics of weeds. *(06 marks)*

* *They are fast growing*
* *They have various dispersal mechanisms*
* *They produce large numbers of seeds*
* *Some are parasitic to crops*
* *They are more aggressive compared to crops*
* *Can tolerate harsh soil conditions*
* *Some are poisonous to livestock*
* *They tolerate harsh climatical conditions*
* *Have several methods of propagation*
* *Their seeds can germinate even when not yet mature*
* *Some produce chemicals that discourage crop growth*
* *Less palatable to animals*
* *They have long dormancy periods, to germinate when conditions favour.*

***Any 6 points 1 mark @***

(b) Explain the cultural practices that can be used to control weed establishment

and growth. *(10 marks)*

* *Mulching – This smothers weeds hence preventing their growth and establishment*
* *Flooding. This suffocates weeds causing their death*
* *Crop rotation – controls parasitic weeds by breading their life cycle*
* *Inter cropping – it denies the weeds space for growth and establishment have controlling it*
* *Controlled Burning – this kills the weed seeds and weeds hence reducing their growth and establishment*
* *Close spacing. This reduces the supply of light to weeds in crop rows hence reducing their growth.*
* *Cover cropping*
* *Trap crops*
* *Timely planting*
* *Controlled grazing*

***Any 5 points 2 marks @ well explained***

***1 mention***

***1 explanation***

(c) What are the advantages of using herbicides to control weeds?  *(04 marks)*

* *Herbicide use requires less labour*
* *Herbicides do not temper with the roots*
* *Herbicides easily control stubborn weeds*
* *Herbicides can be easily used in gardens with a variety of crops or can be used on crops with different morphology*
* *Herbicides do not temper with soil structure*
* *Herbicides are cheap to use on large scale farming*
* *Good quality products are obtained*
* *Eliminates human drudgery*
* *Its relatively fast / quick*
* *Efficient where topography hinders the use of machines.*

***Any 4 points***

1. (a) What is asexual propagation?  *(02 marks)*

*It’s the use of the vegetative parts of a crop in propagation.*

(b) State the advantages of asexual propagation. *(06 marks)*

* *Maintains the good characters of the parent plant*
* *It does not require a very fine seed bed.*
* *The materials do not undergo dormancy*
* *The resulting crop matures early*
* *Planting materials can tolerate harsh soil conditions*
* *Very important in propagating seedless crops like washington oranges*
* *Resulting off springs grow fast*
* *Tissue culture seedlings are free from diseases*
* *Ensures faster multiplication of planting materials*
* *Seed borne diseases are controlled*

***Any 6 points 1 mark @ 6 x 1 = 6 marks***

(c) Describe the procedure of carrying out grafting in fruit trees. *(12 marks)*

* *Select good quality compatible two plants to provide scion and root stock*
* *Sterilize the grafting knife or blade*
* *Put on clean gloves*
* *Use a sharp grafting blade to make a slanting cut on about 45o in root stock plant and remove the shoot*
* *Make a slanting cut of 45o on the other plant to obtain the scion.*
* *Immediately fix the scion on the root stock and ensure the two fit properly*
* *Press the two parts together and ensure proper alignment*
* *Tie the two parts firmly together using grafting tape*
* *Remove some of the leaves from the scion*
* *Place the grafted plant under a shed*
* *Cover the shoot with a transparent polythene paper*
* *Water the plant at least once each day*
* *Remove the polyethene paper as soon as the shoot develops new leaves.*

***12 points in logical order***

***1 mark @ 12 x 1 = 12 marks***

**SECTION II**

**ANIMAL PRODUCTION**

1. (a) Describe the process of milk let down.  *(06 marks)*

* *The udder is stimulated by wasting it with warm water or suckling by the calf*
* *A massage is sent to the brain through the spinal cord*
* *Oxytocin is produced by anterior pituitary gland*
* *Oxytocin flows through the blood stream to the muscles surrounding the alveoli*
* *Oxytocin causes the muscles surround the alveoli to contract*
* *Contraction of the muscles causes milk to move into the gland and teat astern*

***6 points 1 mark @ = 6 x 1 = 6 marks***

(b) What are the characteristics of a good dairy cow?  *(06 marks)*

* *Has a large udder with four functioning teats*
* *Has a long lactation period (longevity)*
* *Produce a lot of milk*
* *Easily converts pastures or feeds to milk*
* *Does not put on excess weight during lactation*
* *Has a big milk vein*
* *Highly tolerant to diseases*
* *Has good temperament or its docile*
* *Has a wedge shaped body*
* *It has a high fertility rate*
* *It has a large belly or abdomen*
* *It has long straight legs*

(c) Outline the factors affecting milk yield and composition in dairy cattle.

*(08 marks)*

* *Breed of the cow*
* *Stage of pregnancy*
* *Heat period*
* *Stage of lactation*
* *Season of the year*
* *Type of feeds given*
* *Frequency of milking / interval of milking*
* *Health of the cow / diseases*
* *Handling of the cow during milking*
* *Animal temperament / docility*
* *Age of the cow*
* *Amount of water given to the cow*
* *Method of milking*
* *Exercise*
* *Animal drugs*

***Any 8 points 1 mark @ 8 x 1 = 8 marks***

1. (a) State the advantages of raising chicken under the free range system.

*(06 marks)*

* *Requires low labour or uses less labour*
* *Birds get vitamin D*
* *Initial cost of system is low*
* *Maintenance of system is low or no feeding costs*
* *Birds get most of the nutrients*
* *Birds get good exercise for proper health*
* *Manure is evenly distributed on the farm*
* *Has low cases of vices*
* *Good system of raising breeding stock*

***Any 6 points 1 mark @ 6 x 1***

(b) Explain the practices that farmers may carry out to improve bird production

under the free range system. *(10 marks)*

* *Supplementary feeding – give supplementary feeds to ensure high production*
* *Dusting to control external parasites*
* *De-worming*
* *Vaccinate birds against killer diseases to reduce mortality*
* *Provide enough laying nests to control the breaking of eggs and egg eating vice*
* *Provide enough water to birds without any restrictions to improve growth and egg production*
* *Provide good housing to the birds to protect it from predators*
* *All birds with vices should be culled to reduce spread*
* *Improve the breeds of the birds through cross breeding to ensure high production*
* *Protect birds from predators by clearing the area around the farm*
* *De-beaking*

***Any 5 points 2 marks @ 5 x 2 = 10 marks***

(c) Give four causes of disease in birds.  *(04 marks)*

* *Inheritance of some diseases*
* *Nutritional deficiencies Protozoa*
* *Pathogens or living organism Virus*
* *Extreme harsh weather Bacteria*
* *Poisoning from feeds and water*
* *Physical injuries to birds.*
* *Ricketosis*

***Any 4 points 1 mark @ 4 x 1 = 4 marks***

1. (a) Explain the steps taken to reduce the spread of diseases in pigs. *(10 marks)*

* *Vaccinate pigs against killer diseases*
* *Quarantine*
* *Provide clean feeds free from any contamination with pathogens*
* *All sick pigs should be isolated from health stock to reduce disease spread*
* *Promptly treat sick pigs to reduce the spread of disease to health pigs*
* *Restrict the movement of visitors into the pigsty to reduce the risks of disease spread*
* *Provide clean feeds to pigs free from pathogens*
* *Clean the feeders and drinkers regularly to reduce contamination with pathogens*
* *Regularly clean the pig sty*
* *Control external parasites regularly since some are vectors*
* *Promptly treat sick animals to reduce the spread of disease*
* *Providing adequate housing*
* *Keeping healthy records*
* *Buying pigs from a reputable firm*
* *Use of artificial insemination*
* *Proper feeding*
* *Having a foot bath*

***Any 5 points 2 marks @ 5 x 2 = 10 marks***

(b) Give the qualities of a good boar.  *(05 marks)*

* *Should be vigorous and healthy*
* *Should have well developed feet*
* *Should be free from defects that can be inherited*
* *Should have a long deep and strong body*
* *Should be easy to handle*
* *Should grow fast*
* *Should mature sexually early*
* *Appearance and condition should confirm the breed*
* *Should produce large quantities of viable sperms.*

***Any 5 points 1 mark @ 5 x 1 = 5 marks***

(c) What are the effects of parasites in pigs?  *(05 marks)*

* *Cause stunted growth in piglets*
* *Cause death to piglets*
* *Cause general weakness*
* *Block alimentary canal*
* *Reduce appetite in pigs*
* *Cause wounds on skin*
* *Cause skin irritation*
* *Transmit diseases to pigs*
* *Emmaciation*
* *Anemia*
* *Rough hair coat*
* *Pot-belly stomach*

***Any 5 points 1 mark @ 5 x 1 = 5 marks***

**SECTION III**

**MECHANIZATION AND FARM MANAGEMENT**

1. (a) State and explain the factors that may influence the farmers decision on the

farm enterprise to start.  *(12 marks)*

* *Capital needed – some enterprises may require more capital to start hence a farmer may look for what is affordable*
* *Market available – presence of a good market for the products may encourage a farmer to start a certain enterprise*
* *Size of land – most agriculture enterprises require enough land to start it*
* *Knowledge and skill – a farmer may prefer to start enterprises where he has knowledge and skills*
* *Climate – crop production requires a good climate with fertile soils*
* *Presence of labour – enterprises like rice production requires availability of enough labour for use.*
* *Government policy – supporting government policy to an enterprises may encourage farmers to choose such enterprises*
* *Availability of cheap input – enterprises with cheap inputs are preferred*
* *Religion and beliefs - Muslims cannot take up pig enterprise since its unlawful for them to eat meat from pigs*
* *Historical background – the Bahima can easily choose cattle enterprise since they have a long history with cattle keeping.*
* *Security*
* *Power source*
* *Common pests and diseases*
* *Water supply*
* *Accessibility*
* *Labour force*

***Any 6 points 2 marks @ 6 x 2 = 12***

(b) How do farmers control the effects of risks and uncertainties in farm

enterprises?  *(08 marks)*

* *Insuring against risks*
* *Building owners equity to have money for use*
* *Improving storage of agriculture products*
* *Planting crops early to reduce pest attack*
* *Growing pest and disease resistant varieties*
* *Producing products on contract to ensure price*
* *Maintaining liquidity at the farm*
* *Providing enough security at the farm*
* *Diversification of production*
* *Engaging in flexible enterprises*
* *Adopting irrigation in crop production*
* *Input rationing*
* *Buffer stocking*
* *Government support*
* *Choice of a more reliable enterprise*
* *Planting early maturing crops*
* *Drainage*

***Any 8 points 1 mark @ 8 x 1 = 8 marks***

1. (a) What are the major factors considered in selecting materials for use in

constructing farm structures?  *(06 marks)*

* *Cost of the material*
* *Durability of the material / quality of the material*
* *Availability of the material*
* *Flexibility of the material*
* *Maintenance costs of material*
* *Knowledge and skills needed to use the material*
* *Interests of the farmer*
* *Type of structure to be built*

***Any 6 points 1 mark @ 6 x 1 = 6 marks***

(b) Describe the characteristics of a good maize crib. *(06 marks)*

* *It should be well ventilated to allow produce dry by air*
* *Should be well raised from the ground to reduce the risk wetting produce*
* *Should have rat guard to keep rats out*
* *Should have a leak proof roof that protects produce from rain*
* *Should have a strong door*
* *Should be big enough to accommodate the produce*
* *It should have a smooth floor*
* *It should have smooth and strong pillars.*

***Any 4 points 1½ mark@ 4 x 1½ = 6 marks***

(c) Outline the features of a good site for a farm building.  *(08 marks)*

* *Itswell drained*
* *Its well protected from strong winds / prevailing winds*
* *Its close to water source*
* *Its close to power source*
* *Its easily accessibility*
* *It has good security*
* *Its big enough to allow future expansion*
* *It has few obstacles*
* *It should be on a good soil type*
* *Farmers’ interest*
* *Topography*

1. (a) How do you prepare a tractor for a day’s work? *(14 marks)*

* *Tighten loose nuts and bolts to reduce loss and accidents*
* *Top up of the water in the radiator with clean soft water in case level is low*
* *Inflate the tyre pressure to the required levels*
* *Remove any chaff and dirt from the radiator fins to ensure efficiency*
* *Grease the moving parts to reduce friction*
* *Top up the engine oil to the required level to ensure efficiency of the engine*
* *Top up the level of the electrolyte with distilled water to a required standard*
* *Top up the fuel to the amount required for a day’s work*
* *Make correct connections of the battery to reduce short circuiting*
* *Set the fan belt to the correct tension to ensure proper running of the fan*
* *Remove dust from the air cleaner to ensure clean air supply to the engine*
* *Bolts / nuts*
* *Radiator*
* *Tyres*
* *Radiator fins*
* *Grease points*
* *Oil sump*
* *Battery*
* *Fuel tank*
* *Battery terminals*
* *Fan belts*
* *Air cleaner*

***Any 7 points 2 marks@ 2 x 7 = 14 marks***

***One part earns 1 mark***

***Action earns 1 mark***

(b) What are the advantages of using a tractor to perform farm work? *(06 marks)*

* *Reduces labour requires or costs for the farm*
* *Perform much more work increasing farm out put*
* *Its fast at performing work / timely*
* *Reduces fatigue to the farmers / drudgery*
* *Produces high quality work*
* *Performs work that human hand cannot perform*
* *Encourages large scale production*
* *Reduces the problem of land fragmentation*
* *Makes farm work more enjoyable / attractive*
* *Fast at performing work*
* *Increases farm output / yield*
* *Leaves the hard rough reducing on erosion*

***Any 6 points 1 mark @ 6 x 1 = 6 marks***

**END**