

Name:.....

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

527/1
PRINCIPLES AND
PRACTICES OF
AGRICULTURE
(Theory Paper)
July / Aug. 2016
2½ hours

MARKING GUIDE



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.

<i>For Examiner's Use Only</i>		
<i>Part/Question</i>	<i>Marks</i>	<i>Examiner's Signature And Number</i>
A		
B: No.		
No.		
No.		
No.		
Total		

PART A (20 Marks)

Answer **ALL** questions in 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)

- A. Fire outbreak
- B. Price changes
- C. Death of a farmer
- D. Theft of livestock

B

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

- A. Topography
- B. Absence of cattle
- C. Limited skills in farming
- D. Poor soil structure

A

- (a) The following are viral diseases in livestock **except**;

- A. Nairobi sheep disease
- B. Swine fever
- C. New castle
- D. Heart water

D

- (b) The planting depth of any crop seed is influenced by;

- A. Soil moisture
- B. Seed size
- C. Soil depth
- D. Seed viability

B

2. (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*

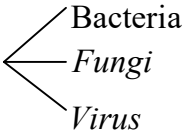
Any 4 points 1 mark@ 4 x 1 = 4 marks

(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 $\frac{1}{2}$ @ $4 \times \frac{1}{2} = 2$ marks

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

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

Any 3 points 1 mark@ $3 \times 1 = 3$ marks

4. (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 $\frac{1}{2}$ mark @ $6 \times \frac{1}{2} = 3$ 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

5. 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

6. (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*

7. (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 breaching their life cycle*
- *Inter cropping – it denies the weeds space for growth and establishment hence 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

8. (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 45° in root stock plant and remove the shoot*
- *Make a slanting cut of 45° 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 polythene 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

9. (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

10. (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*

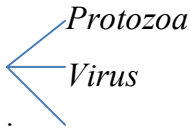
Any 6 points 1 mark @ 6 x 1

- (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*
- *Pathogens or living organism* 
 - Protozoa
 - 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

11. (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

12. (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

13. (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*

14. (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