

UGANDA MARTYRS UNIVERSITY

FACULTY OF AGRICULTURE

Bachelor of Science in Agriculture Bachelor of Science in Organic Agriculture

Year 2 Final Assessment: Academic Year 2014/2015

Module AG 8/OA 10: Appropriate Agro-Mechanization

Date: Tuesday, 7th July, 2015 Time: 02:00pm – 05:00pm

INSTRUCTIONS:

- *Read and understand the question before answering*
- *QUESTION One is **COMPULSORY***
- *Select and answer any other Three (3) **Questions***
- *Do not write anything on a question paper*
- *Start every question on a **new** page*
- *You are allowed **Three Hours** for the examination*

Question 1: COMPULSORY (40 Marks)

- a) Arabica Coffee best grows in cool temperature climatic conditions. As a result it is grown in high altitudes areas of mountain like Elgon, Kenya, Rwenzori etc. on such mountains there is always a lot of rain water trapped in higher levels especially at the base of various peaks. Local governments in Mount Rwenzori area want to use this water for doubling Organic Arabica Coffee production level for the niche EU markets through supplementary irrigation.
- i) With clear reasons identify the best irrigation type for this project.
 - ii) Describe clearly the irrigation type you have selected as it appears laid on the mountain slopes.
- b) Describe how you will help the farmers under your supervision to select or identify the best ox-drawn mould plough from the market.
- c) Explain why fruits for distant markets should always be harvested at their physiological maturity.

- d) Describe how you will pack fresh mango fruits for supermarkets in Britain.

Question 2:

- a) SAKATA Company wants to export organic mango fruit and rice which is free of chemicals to niche markets of EU.
- i) What best storage system should SAKATA Company use to meet this market requirement?
 - ii) For storage systems you have given, what storage conditions are required to keep the rice fresh for more than five years and mango fruit fresh for six months?
 - iii) Under the current Ugandan conditions what problem (s) do you think SAKATA will meet with the storage systems? Provide solutions o the problems you have identified.
- b) Explain the importance of proper ventilation in the housing of layers under deep litter system in a country with high humidity most of the year like Uganda, Tanzania, etc.
- c) Explain how the layers in (b) above will exchange heat energy with housing structure.

Question 3:

- a) What does the term Relative Humidity (RH) mean to a farmer under your supervision?
- b) Describe how spraying of pesticide should be done in a very limited stream of wind.
- c) Using sketches describe with reasons the root development pattern of one tomato stool under drip irrigation fed by one emitter in:
- i) Clay soils (heavy soils)
 - ii) Sandy soils (light soils)

Question 4:

- a) Define the following terms of Internal Combustion Engine:
- i. Stroke,
 - ii. Total cylinder volume,
 - iii. Compression ratio
 - iv. Four – stroke engine
- b) Give three (3) broad areas where internal combustion engine has been used in human life.
- c) Describe how to carry out battery maintenance of farm vehicles.

- d) Draw a well labeled diagram of hitch assembly of ox-drawn mould board plough. Explain its function to farmers under your supervision.

Question 5:

- a) Draw a crib and explain how it works.
b) As an extension worker, what factors will teach your farmer to follow or consider for constructing a maize crib?
c) Explain the importance of setting animal drawn mould board plough before it begins to work.

How do you know that the plough is properly adjusted?

Question 6:

- a) With sketches describe how you will help farmers to stake correctly bags of maize grain in ware house. Give reasons why the staking is done as you have done.
b) Describe the disadvantages of:
i. Sprinkler irrigation
ii. Drip irrigation
c) Mr. Alepere Peter has tomato arm under drip irrigation in sandy soils o Turkana area in Kenya. He uses in-organic fertilizers like NPK injected into irrigation water to improve productivity.
i) At what distance should the emitters be placed from the stems of the tomatoes?
ii) Explain why he emitters are placed at such a distance.
iii) With reasons, describe the pattern of root development of these tomato plants.

End