UGANDA MARTYRS UNIVERSITY
FACULTY OF AGRICULTURE
Examinations 2013-2014

Bachelor of Science in Agriculture Year 2
Bachelor of Science in Organic Agriculture Year 2
Exam: Appropriate Agro-mechanization
Time: 10:00am – 01:00pm (3 Hrs)
Date: 02nd July 2014

Instructions:

i. *Question One is **COMPULSORY(40 Marks)***
ii. *Attempt any other three (3) questions*
iii. *Write clearly, number the questions appropriately on the answer booklet*
iv. *Read and understand the instructions on the last page of the answer booklet*
v. *Do not write anything on a question paper*

1a) With the help of sketches describe the pattern of water distribution as seen from above in a tomato garden which is planted in lines under:
i) Drip irrigation where each tomato stool is fed by one dripper/emitter
ii) Sprinkler irrigation

b) With clear reasons which of the above two water distribution patterns would you recommend for farmers under your supervision for the tomato production practice in question 1 a) above?

c) Mr. Mugisha Paul of Kamwenge district is a large commercial maize farmer and uses big mechanical dryer for drying the maize. As a new farmer without any experience, he uses very high temperatures above 60 °C to dry the freshly harvested maize which is of about 20% moisture content.
i) What quality problems is Mr. Mugisha facing?
ii) What advise do you give him to address the problems?

d) Explain why it is always important to undertake routine servicing of farm vehicles after every 4,000 to 5,000km. What are the consumable components which are usually replaced?

2 a) Describe briefly without any sketch how Air-and-water cooling system works in farm vehicles.
b) What are the main causes of overheating in such cooling system in 2a) above?
c) Songa Rose is a beans farmer in Masindi district. She wants to grow 5ha of beans yearly under irrigation about 2-3km from river Kafu. The land surface near the river is a very gentle slope with few undulations. What best irrigation system should she use and why? Describe briefly with sketches the irrigation system you have chosen.

3 a) Explain why it is always necessary to carry out knapsack sprayer calibration prior to spraying?
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)

4 a) Explain the effects of rapid drying on the quality of:
   i. maize grain and its flour,
   ii. paddy and milled rice,
   iii. groundnuts

b) As an extension worker, explain the basic requirements of threshing/shelling of grain when using motorized threshers

5 a) You are hired as a consultant by the Local Councils on Finance Committee in your sub-county to provide technical specifications for ox-drawn mould board plough.
   i) What are the most critical parameters in the plough that you will include in your specifications?
   ii) Explain the importance of these parameters.

b) As an extension worker, what are the factors will teach your farmers to follow or consider for constructing a maize crib?

6 a) without sketches describe how 4-stroke petrol engine works

b) In which internal combustion engine stroke system does fuel injector and injector pump apply? Explain their importance in the farm vehicles

c) With sketches describe the correct way of staking bags of maize grain in warehouse. Give reasons why the staking is done as you have described.