



(The University of choice)

**MASINDE MULIRO UNIVERSITY OF
SCIENCE AND TECHNOLOGY
(MMUST)**

**UNIVERSITY EXAMINATIONS
2021/2022 ACADEMIC YEAR**

**YEAR ONE SECOND SEMESTER MAIN EXAMINATIONS IN
CERTIFICATE IN AGRICULTURE**

COURSE CODE: CAG 017

COURSE TITLE: FARM POWER AND MACHINERY

DATE: 22ND April, 2022

TIME: 3-5PM

Instructions:

This paper consists of 5 questions

Section A is compulsory, Answer any 3 questions from Section B

MMUST observes ZERO tolerance to examination cheating

SECTION A

Question One (25 marks)

- (a) Describe the sources of farm power used in farm operations
(6 marks)
- (b) With the aid of a diagram, define the following terms for a three-cylinder engine
- Firing order
 - Four stroke (4 marks)
- (c) With the aid of a diagram, outline the components of a mouldboard plough
(4 marks)
- (d) Highlight two fixed costs and two variable costs incurred in the ownership of agricultural machinery
(4 marks)
- (e) State and differentiate types of agricultural tractors (6 marks)
- (f) Explain the functions of the tractor hydraulic system and state how it influences implement hitching
(4 marks)

SECTION B

Question Two (15 marks)

- (a) Distinguish between primary and secondary cultivation (3 marks)
- (b) With the aid of well labelled diagrams, describe the mode of action of the
- Tandem harrow
 - Offset harrow (4 marks)
- (c) Describe the two different types of diesel fuel injectors used in tractor engines
(4 marks)
- (d) Define ballasting and hence state the different ways in which agricultural tractors are ballasted
(4 marks)

Question Three (15 marks)

- (a) Describe the configuration and the mode of action of the following implements in land preparation
- Mouldboard plough
 - Reversible mouldboard plough
 - Rotorvator (6 marks)
- (b) Describe the components and of a boom sprayer (3 marks)
- (c) Outline the reasons and remedies for the following anomalies during tractor operation
- Black smoke during engine running
 - White smoke during engine running
 - Excessive slippage during field operations (6 marks)

Question Four (15 marks)

- (a) Describe the components and functioning sequence of a combine harvester, hence state how it can be customised for different grains(7 marks)
- (b) Enumerate the typical routine maintenance procedures that should be performed for the farm tractor (8 marks)

Question Five (15 marks)

- (a) Describe the procedure of calibration of a row planter (5 marks)
- (b) State the different ways in which tractor implements are hitched onto the tractor (5 marks)
- (c) Explain the criteria that as a farm machinery operator you would adopt in basic
- i. Machinery management
 - ii. Machinery storage (5 marks)

