



MACHAKOS UNIVERSITY COLLEGE

(A Constituent College of Kenyatta University)

University Examinations 2015/2016

SCHOOL OF AGRICULTURE AND NATURAL RESOURCES MANAGEMENT

DEPARTMENT OF AGRICULTURAL EDUCATION AND EXTENSION

SECOND SEMESTER EXAMINATION FOR DEGREE IN BACHELOR OF

AGRICULTURAL EDUCATION AND EXTENSION

KRM 201: AGRICULTURAL FIELD ENGINEERING

Date: 18/4/2016

Time: 8.30-10.30 AM

INSTRUCTIONS

This paper consists of FIVE questions

Answer question one and other two questions in this paper

Question 1:

- a) Differentiate between the following terminologies:
- i. Three point and draw bar hitching systems (2 marks)
 - ii. Drilling and precision planting systems (2 marks)
 - iii. Conventional and minimum tillage systems (2 marks)
 - iv. Chisel ploughing and harrowing (2 marks)
 - v. Compression and power engine strokes (2 marks)
 - vi. Furrow and border irrigation systems (2 marks)
- b) Table Q1 was extracted from profile leveling field note book where a proposed school farm of Machakos University College is to be established. Determine the missing readings 'A' TO 'F' and carry out the arithmetic check. (13 marks)

Table Q1

BS	IS	FS	HI	RL
0.618			A	20.480
	1.654			B
	C			19.898
2.135		D	E	18.988
	1.231			F
		0.991		20.132

- c) Explain five (5) functions of tillage operation (5 marks)

Question 2:

- a) Explain the functions of each component making the following systems:
- i. Lubrication system (5 marks)
 - ii. Power-take-off (PTO) system (4 marks)
 - iii. Hydraulic system (6 marks)
- b) Explain five (5) benefits of mulching in a farm (5 marks)

Question 3:

- a) Explain five (5) factors that influence response of crops to fertilizer application (10 marks)
- b) Explain five (5) good practices of maintaining tractor diesel engines (10 marks)

Question 4:

- a) Explain two ignition systems used in combustion engines
- i. Spark-ignition (SI) (4 marks)
 - ii. Compression ignition (CI) (4 marks)
- b) Using examples, distinguish among the following types of tractor-drawn implements
- i. Trailed (4 marks)
 - ii. Semi-mounted (4 marks)
 - iii. Mounted (4 marks)

Question 5:

- a) Explain the actions undertaken during the maintenance of a tractor after it has been operating for ten hours (12 marks)
- b) What is the difference in operating a tractor in-furrow and on-land (6 marks)
- c) Define the following surveying techniques;
 - i. Geodetic surveying (1 mark)
 - ii. Plane surveying (1 mark)