



MACHAKOS UNIVERSITY

University Examinations for 2018/2019 Academic Year

SCHOOL OF AGRICULTURAL SCIENCES

DEPARTMENT OF AGRICULTURAL EDUCATION AND EXTENSION

SUPPLEMENTARY SEMESTER EXAMINATION FOR THE DEGREE OF
BACHELOR OF SCIENCE IN AGRICULTURAL EDUCATION AND EXTENSION

AGN 374 FARM MACHINERY

TIME: 26/7/2019

DATE: 8:30 – 10:30 AM

INSTRUCTION TO CANDIDATES: Answer ALL questions from Section A and any other TWO from Section B:

SECTION A: COMPULSORY: (30 MARKS)

QUESTION ONE

- a. Explain the Principles and Stages of Agricultural Mechanization. (4 marks)
- b. Explain the following as used in farm machinery.
 - i. Tillage (2 marks)
 - ii. Objectives of tillage in a five acre maize farm (4 marks)
- c. Distinguish between a disc plough and a mould board plough. (4 marks)
- d. Describe the following tractor mounted equipment's for land development and soil conservation.
 - i. Bund Former (2 marks)
 - ii. Ridger (2 marks)
- e. Explain four care and maintenance of a dusters to be used in a paddy field. (4 marks)
- f. Explain the three desirable quality of good sprayers. (3 marks)
- g. Combine harvester has the ability of doing more than one function at a go. Describe the functional importance of combine harvester. (5 marks)

SECTION B: ANSWER ANY TWO QUESTIONS (40 MARKS)

QUESTION TWO (20 MARKS)

- a. Mechanization is the use of machinery in an agricultural farm. Explain the benefits of mechanization to a farmer. (8 marks)
- b. Disc harrow is a secondary tillage implement. Using a well labelled sketch describe the components of disc harrow used in a wheat field (8 marks)
- c. A seed drill with mechanical seed metering device mainly consists of four components. Describe the four components. (4 marks)

QUESTION THREE (20 MARKS)

- a. Share is a part of a mould board plough that cuts into the soil. Describe five types of share. (10 marks)
- b. Total draft of four bottom, 35 cm MB plough when ploughing 18 cm deep at 5 kmph speed is 1600 kg. Determine:
 - i. Unit draft in kg/cm^2 (4 marks)
 - ii. Actual power requirement? (3 marks)
 - iii. If the field efficiency is 75% the rate of doing work in ha/hr. (3 marks)

QUESTION FOUR (20 MARKS)

- a. The mechanism of a seed drill or fertilizer distributor which deliver seeds or fertilizers from the hopper at selected rates is called seed metering mechanism. Explain five types of seeds metering mechanism. (10 marks)
- b. Maximum yield of maize is obtained with a population of 30,000 plants per hectare. The rows are 140 cm apart and an average emergence of 80% is expected. Find:
 - i. How many seeds per hill should be planted if hills are 140 cm apart? (5 marks)
 - ii. What would be seed spacing if crop is drilled? (5 marks)

QUESTION FIVE (20 MARKS)

- a. Sprayers are plant protection implements. Explain three classification of sprayers based on power source. (6 marks)
- b. Cultivators are used as a secondary implement, but some farmers use in making lines in manual planting. In reference to its use, describe the two types of cultivators clearly bringing out their differences. (7 marks)
- c. Mower is a machine to cut herbage crops and leave them in swath. Describe the conventional parts of the mower. (7 marks)