



MACHAKOS UNIVERSITY

University Examinations for 2020/2021 Academic Year

SCHOOL OF AGRICULTURAL SCIENCES

DEPARTMENT OF AGRICULTURAL EDUCATION AND EXTENSION

THIRD YEAR SPECIAL/ SUPPLEMENTARY EXAMINATION FOR

BACHELOR OF SCIENCE IN AGRICULTURAL EDUCATION AND EXTENSION

AGN 374: FARM MACHINERY

DATE: 23/3/2021

TIME: 2.00-4.00 PM

INSTRUCTIONS:

Answer *ALL* questions from Section A and any other *TWO* from Section B:

SECTION A: COMPULSORY: (30 MARKS)

QUESTION ONE (30 MARKS)

- a) Explain the Stages of Agricultural Mechanization. (4 marks)
- b) Describe four differences between disc plough and a mould board plough. (4 marks)
- c) Discuss two types of intercultural implements. (4 marks)
- d) Describe the following tractor mounted implements for land development and soil conservation.
 - i. Bund Former (2 marks)
 - ii. Ridger (2 marks)
- e) Explain four care and maintenance of a disc harrow used in a paddy field. (4 marks)
- f) Explain three desirable qualities of a good sprayer. (3 marks)
- g) Describe two functions of a coulter in a mouldboard plough. (2 marks)
- h) Describe the functional importance of combine harvester. (5 marks)

SECTION B: ANSWER ANY TWO QUESTIONS (40 MARKS)

QUESTION TWO (20 MARKS)

- a) Discuss four constraints experienced in the use of farm mechanisation. (8 marks)
- b) With an aid of a well labelled diagram describe the components of a disc harrow (8 marks)
- c) Describe the four components of a seed drill (4 marks)

QUESTION THREE (20 MARKS)

- a) Explain five types of share as a component of a mouldboard plough. (10 marks)
- b) Calculate the size of a tractor to pull a four bottom 35 cm MB plough through a depth of 8 cm. The soil resistance is 0.8 kg/cm². The speed of the tractor is 5.5 km/h, transmission and tractive efficiency of the tractor being 80% and 30% respectively. (10 marks)

QUESTION FOUR (20 MARKS)

- a) Describe five types of shares in a mouldboard plough (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) Explain three classification of sprayers based on power source. (6 marks)
- b) Discuss four grain combine losses and straw combines in wheat field. (8 marks)
- c) Discuss the two types of cultivators. (6 marks)