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AGRICULTURAL ENGINEERING LEVEL 6

ENG/OS/AGR/CR/01/6/A

OPERATE AGRICULTURAL AND RELATED PRODUCTION MACHINERY AND EQUIPMENT

July/August 2024



**TVET CURRICULUM DEVELOPMENT, ASSESSMENT AND CERTIFICATION COUNCIL
(TVET CDACC)**

WRITTEN ASSESSMENT

3 HOURS

INSTRUCTIONS TO CANDIDATE

1. This paper consists of two sections; **A** and **B**
2. Answer **ALL** the questions as guided in each section
3. Marks for each question are as indicated in the brackets
4. You are provided with a separate answer booklet to answer the questions
5. Do not write in this question paper

This paper consists of THREE (3) printed pages
Candidates should check the question paper to ascertain that all pages are printed as indicated
and that no questions are missing

SECTION A: (40 Marks)

Answer ALL questions in this section.

1. Planting is an essential step in farming and it requires careful consideration of different factors for its effectiveness.
 - a) Define the term precision planting. (1 marks)
 - b) Highlight **four** principle requirements while using a cell type metering device of a precision planter. (4 marks)
2. Mouldboard plough is a farm implement used for primary tillage operations such as preparing soil for planting. Outline **four** parts of a mouldboard plough bottom. (4 marks)
3. Highlight **four** methods of planting crops. (4 marks)
4. Knapsack sprayers are commonly used in agriculture for targeted applications of chemicals in small to medium-sized areas State **four** parts of a knapsack sprayer. (4 marks)
5. Highlight **four** advantages of farm mechanization. (4 marks)
6. Outline **four** post operation practices carried out on disc plough. (4 marks)
7.
 - a) State **two** types of discs on disc harrows. (2 marks)
 - b) Outline **four** methods for increasing the penetration of a disc harrow. (4 marks)
8. Highlight **three** adjustments carried out on a rotavator during operation. (3 marks)
9. Outline **two** problems that may affect hitching and towing (2 marks)
10. State **four** personal protective equipment necessary while handling chemicals for spraying. (4marks)

SECTION B: (60 Marks)

Answer **ANY THREE** questions from this section.

11.

- a) The following results were obtained while calibrating a seed drill.

Number of furrow openers – 8

Spacing between furrows – 18 cm

Diameter of drive wheel – 1.4 m

RPM of the drive wheel – 600

Seed collected – 35 kg

Calculate the following:

- i) The effective width of the seed drill; (2 marks)
- ii) The test area used for 600 revolutions; (3 marks)
- iii) The seed in kg/ha. (3 marks)
- b) Using a sketch, discuss the significance of a lift angle in chisel ploughs. (4 marks)
- c) Outline **four** operational differences between tractor mounted mouldboard plough and disc plough (8 marks)

12.

- a) Using sketches, discuss the following mouldboard adjustments: (12 marks)
- i) Vertical suction;
 - ii) horizontal suction;
 - iii) Throat clearance.
- b) Boom sprayers are very crucial in pesticide spray and fertilizer application. Explain **four** benefits of boom sprayer calibration. (8 marks)

13.

- a) Outline **six** functions of a seed drill. (6 marks)
- b) State **five** factors that are considered when selecting primary cultivation machinery. (5 marks)
- c) Highlight **three** important functions performed by a cultivator (3 marks)
- d) Outline **six** steps in maintenance and repair practices on a seed and fertilizer hoppers. (6 marks)

14.

- a) With the aid of a diagram, explain the operation of oscillating spout fertilizer distributor used in application of granular fertilizer. (8 marks)
- b) With the aid of a labeled diagram, discuss **FOUR** sowing methods. (12 marks)

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