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AGRICULTURAL ENGINEERING LEVEL 6

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

Operate Agricultural and Related Production Machinery and Equipment

March/April 2025



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

**WRITTEN ASSESSMENT
Time: 3 HOURS**

INSTRUCTIONS TO CANDIDATE

1. This paper consists of **TWO** sections: **A** and **B**.
2. Answer **ALL** questions in section A and **ANY THREE** (3) questions in section B.
3. Marks for each question are indicated in the brackets.
4. Candidates are provided with a separate answer booklet
5. Do not write on the question paper.

This paper consists of FOUR (4) 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)

Attempt ALL the questions in this section.

1. A farmer was advised by a field officer to adopt modern secondary tillage practice to improve soil health and crop yields. As an agricultural engineering expert, enumerate FOUR aims of secondary tillage. (4 Marks)
2. A farmer relies heavily on disc harrow to prepare the soil for planting. However, during a recent operation, the farmer noticed that the disc harrow was not working properly. List FOUR reasons that may lead to this. (4 Marks)
3. You advised a farmer to invest in a new hitch system due to the issues faced with the current hitch system. Outline FOUR functions that the new hitching system will perform. (4 Marks)
4. Ploughing is the practice of modifying the state of the soil in order to provide conditions favorable to crop growth. Give FOUR objectives of ploughing. (4 Marks)
5. The Kenya Agricultural Mechanization Services project is a public-private partnership initiative aimed at promoting farm mechanization in Kenya. The farmers still experience multiple challenges despite of these intervention. Outline FOUR limitations facing farm mechanization in Kenya. A corn farmer is concerned about the environmental impact and reduced efficacy of his pesticide applications due to spray drift. State FOUR techniques of minimizing the spray drift. (4 Marks)
6. You intend to undertake a farm operation using a farm implement. Outline FOUR safety measures that you should insist on when hitching the implement to a tractor. (4 Marks)
7. You are the sub county agricultural officer and you have noticed increased use of disc plough over time compared to mouldboard plough. Outline FOUR reasons for this trend. (4 Marks)
8. You have been employed as repair and maintenance technician in an agricultural farm. You handled the following components while undertaking your duties. Explain ONE maintenance practice undertaken on each of the component.
 - a. Gearbox.
 - b. Chain.
 - c. Rotor.
 - d. Blade.(4 Marks)

9. In order for agricultural machine to last, repair and maintenance is crucial. List FOUR types of information that should be captured in the post-operation report for agricultural machinery. (4 Marks)

SECTION B (60 MARKS)***Attempt Any THREE Questions in This Section***

10. Planting is a crucial step in agriculture, horticulture, and forestry, as it sets the stage for the growth and development of plants.
- a. Name FOUR types of furrow openers (4 marks)
 - b. Explain FOUR functions of a row crop planter. (8 marks)
 - c. Discuss FOUR factors influencing germination of drilled seeds. (8 marks)
11. Mouldboard plough is a primary tillage implement used in agriculture to turn, loosen soil and create furrows for planting.
- a. Explain FOUR adjustments in mouldboard plough (8 Marks)
 - b. Calculate the area covered per day of 8 hours by a tractor drawn four bottom 35cm plough if the speed of the ploughing is 5 kmph, the time lost in turning is 10%. (4 Marks)
 - c. Outline functions of FOUR parts of a mouldboard plough. (8 Marks)
12. Fertilizer distributors are used in order that the fertilizers may be distributed evenly over a larger area ensuring that each plant receives equal amount.
- a. State FOUR qualities of
 - b. Explain the construction of FOUR common types of fertilizer distributors. (8 Marks)
 - c. Describe the construction of a trailed type manure spreader. (8 Marks)
13. With the use of sprayers, it is possible to have uniform chemical distribution at both high and low application rates.
- a. Explain functions of THREE parts of a boom crop sprayer. (6 marks)
 - b. Outline the EIGHT steps involved in field calibration of a sprayer. (8 Marks)
 - c. Explain THREE forms of liquid sprays. (6 Marks)