2910/205
AGRICULTURAL ENGINEERING II
Oct./Nov. 2022
Time: 3 hours

THE KENYA NATIONAL EXAMINATIONS COUNCIL

DIPLOMA IN SUSTAINABLE AGRICULTURE
AND RURAL DEVELOPMENT

MODULE II

AGRICULTURAL ENGINEERING II

3 hours

INSTRUCTIONS TO CANDIDATES

You should have the following for this examination:
    Drawing instruments;
    Non-programmable scientific calculator;
    Answer booklet.
This paper consists of EIGHT questions.
Answer any FIVE questions in the answer booklet provided.
All questions carry equal marks.
Maximum marks for each part of a question are indicated.
Candidates should answer the questions in English.

This paper consists of 3 printed pages.

Candidates should check the question paper to ascertain that
all the pages are printed as indicated and that no questions are missing.

Turn over

1. (a) Outline **four** uses of levelling survey in agriculture. (6 marks)

   (b) The following staff readings were recorded in sequence during a levelling exercise with the instrument set between 3rd and 4th readings:

   1.283, 2.462, 1.995, 2.121, 0.637 m.

   (i) Illustrate the set up of the survey instrument and the staff stations given that the reduced level of the first station is 209.740 m.

   (ii) Book the readings in the field book using the rise and fall method.

   (iii) Determine the reduced levels of the remaining stations.

   (iv) Check the entries. (14 marks)

2. (a) Define each of the following building construction terms:

   (i) blinding;
   (ii) backfilling;
   (iii) hard core;
   (iv) foundation. (4 marks)

   (b) Highlight **six** factors considered in the choice of the type of foundation to use for a particular farm structure. (6 marks)

   (c) Describe the process of concrete making. (10 marks)

3. (a) Describe **three** components required for a rain water harvesting system. (6 marks)

   (b) State **four** disadvantages of surface water reservoirs. (4 marks)

   (c) Explain **five** reasons for constructing off-stream storage structures on a farm. (10 marks)

4. (a) Highlight **five** reasons for farm water treatment. (5 marks)

   (b) With the aid of a diagram, describe the **three** types of water aquifers. (15 marks)

5. (a) Outline **four** disadvantages of open drainage. (4 marks)

   (b) Illustrate a mole drainage system. (4 marks)

   (c) Describe **six** causes of poor drainage on a farm. (12 marks)

6. (a) Highlight five advantages of sub-surface irrigation. (5 marks)

   (b) Describe five methods used for measuring irrigation water. (15 marks)

7. (a) Outline six advantages of land grading in agriculture. (6 marks)

   (b) Explain seven factors considered in land grading. (14 marks)

8. (a) State five care and maintenance requirements for a fish pond. (5 marks)

   (b) Highlight five factors considered in the site selection for a fish pond. (5 marks)

   (c) Discuss the features of a good grain crib. (10 marks)

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