

1405/315
AGRICULTURAL ENGINEERING
June/July 2020
Time: 3 hours



THE KENYA NATIONAL EXAMINATIONS COUNCIL
CRAFT CERTIFICATE IN GENERAL AGRICULTURE

AGRICULTURAL ENGINEERING

3 hours

INSTRUCTIONS TO CANDIDATES

You should have the following for this examination:

Answer booklet;

Non-programmable scientific calculator.

This paper consists of TWO sections; A and B.

Answer ALL questions in Section A and any FOUR questions from section B in the answer booklet provided.

Each question in Section A carries 4 marks while each question in Section B carries 15 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.

SECTION A (40 marks)

Answer ALL questions in this section.

1. List **four** factors that influence the consumptive use. (4 marks)
2. Outline **four** sources of flooding in farms. (4 marks)
 - Rain fall
3. State **four** causes of back firing during oxy-acetylene gas welding. (4 marks)
 - More oxygen pressure
4. List **four** types of rotary movers. (4 marks)
5. Highlight **four** disadvantages of using animal power in a farm. (4 marks)
 - Low P consuming
 - Get tired with increase in time
 - Do small quantity of work
6. Outline **four** uses of mortar in the construction of buildings. (4 marks)
 - Joining building stones
 - Construction of brick floor
 - Construction of brick floor
7. Sketch each of the following surveying equipment:
 - (a) foot plate; (2 marks)
 - (b) cross staff. (2 marks)
8. Explain **two** sources of ground water. (4 marks)
 - Spring
 - Boreholes
9. Identify **four** types of water erosion processes. (4 marks)
 - Rill
 - Gully
 - street
 - Splash.
10. State **four** functions of a tractor transmission gear box. (4 marks)

SECTION B (60 marks)

Answer any **FOUR** questions from this section.

11. With the aid of a labelled diagram, explain the operation of a pick-up hay baler. (15 marks)

12. Using labelled diagrams, explain the operation of a 2-stroke cycle ignition engine. (15 marks)

13. (a) Highlight **five** disadvantages of live fences. (5 marks)

- Wind breaker
- Dangerous to human beings
- Expensive

(b) Discuss the benefits of afforestation in agriculture. (10 marks)

- Income
- Control soil erosion
- Maintain soil structure
- Drainage
- Land reclamation

14. The following readings were taken in sequence along a centre line of an irrigation channel at a constant interval of 15 m. The first reading was a backsight taken at chainage of 145 m of reduced level 98.085 m. The instrument was shifted after the fourth and ninth readings:

2 3 4 5 6 7 8 9 10 11 12 13
 3.150, 2.245, 1.125, 0.860, 3.125, 2.760, 1.835, 1.470, 1.965, 1.225, 2.390 and 3.035 m

(a) Book the readings using the collimation system.

(b) Compute the reduced levels.

(c) Check the entries.

| | BS | IS | FS | RL |
|----|-----|-------|-------|--------|
| 1 | 145 | | | 98.085 |
| 2 | | 3.150 | | |
| 3 | | 2.245 | | |
| 4 | | | 1.125 | |
| 5 | | | 0.860 | |
| 6 | | 3.125 | | |
| 7 | | 2.760 | | |
| 8 | | 1.835 | | |
| 9 | | | 1.470 | |
| 10 | | | 1.965 | |
| 11 | | 1.225 | | |
| 12 | | 2.390 | | |
| 13 | | | 3.035 | |

RL
 147.1625
 133.455
 142.195

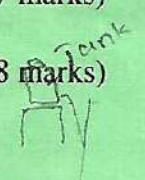
15. With the aid of a labelled diagram, describe the stages of treating surface water for a farm estate.

- Primary coagulation
- Secondary coagulation
- Filtration
- Chlorination
- Filter storage

(a) Highlight the benefits of farm drainage. (7 marks)

- Settle leachings
- Control soil position
- Removal of toxic accumulation
- Improved soil structure
- Increase crop production

(b) Using a labelled diagram, explain drip irrigation method. (8 marks)



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