



**NATIONAL EXAMINATION
AND SCHOOL INSPECTION
AUTHORITY**

T004

Monday, 26/7/2021

08:30 – 11:30 AM

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TVET NATIONAL EXAMINATIONS, RTQF LEVEL 5, 2020-2021

QUESTIONS and ANSWERS BOOKLET

OPTION/TRADE: CROP PRODUCTION

SUBJECT: Methods of irrigation and extension technics

ACADEMIC YEAR: **2020-2021**

Read carefully the instructions on page (i) & (ii).

FOR EXAMINER'S USE ONLY

[illegible]



TVET NATIONAL EXAMINATION, RTQF LEVEL 5, 2020-2021

INSTRUCTIONS TO CANDIDATES: PART I (Answer Booklet)

1. A candidate should fill in the actual names and the index number on the cover of this questions and answer booklet on the provided place (Black Box).
2. It is illegal for a candidate to write any of his/her names, index number or a school name inside the answer booklet.
3. A candidate should check if all pages of the answer booklet are complete. No candidate should remove or tear any pages or part of it from the answer booklet.
4. A candidate should answer in the language in which the examination is set. (See page **(ii)**)
5. A candidate should sign on the sitting plan when submitting the answer booklet. He/she has also to check if the answer booklet is well sealed.
6. No extra paper is allowed in the examinations room. If a candidate is caught with it his/her results will be nullified.
7. No candidate is allowed to write answers not related to the subject being sat for, otherwise it will be considered as a cheating case.
8. Write your answers on the 12 lined pages (From page 1 of 12 to page 12 of 12).
9. Use the last non-lined pages as draft.
10. Results for any candidate who is caught in examination malpractices are nullified. The cheating can be recognized during examinations administration, marking exercise or even thereafter.

TVET NATIONAL EXAMINATION, RTQF LEVEL 5, 2020-2021

OPTION/TRADE: CROP PRODUCTION

SUBJECT: Methods of irrigation and extension technics

DURATION: 3 hours

INSTRUCTIONS TO CANDIDATES: PART II (Question paper)

The paper is composed of two (2) main Sections as follows:

Section I: Attempt all the Twelve (12) questions (60 marks)

Section II: Attempt any Four (4) questions out of Six (6) (40 marks)

Allowed materials:

- Ruler and square
- Calculator

Note:

Every candidate is required to carefully comply with the provided assessment instructions.

- 01.** Simple manual irrigation is an effective method for making water available to crops. **(5 marks)**
- What is the efficient use of simple manual irrigation method?
 - Who is in charge of inspection for irrigation system of small scale?
- 02.** Sprinkler irrigation is composed by three main types, and each one has its own advantages and disadvantages. **(5 marks)**
- What is difference between semi portable system and fully potable system?
 - What are the disadvantages of the two systems?
- 03.** Rainfall is an important source of crops water need.
- Explain effective rainfall and give the environmental characteristics of rainfall. **(3 marks)**
 - Determine the total amount of water received by the field of 5ha under Rainfall of 15 mm depth. **(2 marks)**
- 04.** The drip irrigation is a developing irrigation system in Rwanda. Give the five (5) main components of drip irrigation system. **(5 marks)**
- 05.** Match the following irrigation systems in column A with their complements in columns B. Write full sentences. **(5 marks)**

Column A	Column B
Surface irrigation systems include.....	Pump, Pipeline and Sprinkler.
Sprinkler irrigation system is composed by	Flooding, bed or border method (flat beds), basin method (ring and basin) and, furrow method (ridges and furrows, broad ridges or raised beds)
Drip irrigation system is composed by	c) Pump, Main line and sub line, lateral lines, small pipes lines with nozzles.

- 06.** Both farmer and extensionist need to make a decision on activities to be undertaken or the innovation to be adopted. Give the main steps in decision making process. **(5 marks)**
- 07.** Distinguish correct from wrong statements: **(5 marks)**
- Evapo-transpiration is the total amount of water used for transpiration by the plants and evaporation from surrounding ground surface.
 - Furrow irrigation layout comprises furrows and ridges
 - Efficiency use of sprinkler irrigation method is that power requirement is high
 - By drip irrigation, water is dropping into soil at high rate through outlets called emitters
 - The principle of sprinkler irrigation consists of spraying water source uniformly as ordinary rainfall
- 08.** There are a number of elements that play an important role in determining suitable discharges during irrigation. Clarify those elements. **(5 marks)**
- 09.** Crop which are cultivated either on hillsides or in flat land need water whatever circumstance. Depending on size of land watering or irrigation may be practiced to satisfy this demand. Explain reasons of these needs of water by the plants. **(5 marks)**
- 10. a)** Draining land can be done in two major methods. Give these methods. **(2 marks)**
- b)** Explain briefly the components of drainage system. **(3 marks)**
- 11.** Irrigating lands by sprinkler method has the greater advantages than surface irrigation methods. Give the potentialities of sprinkler irrigation. **(5 marks)**
- 12.** One the main problems with drip irrigation is blockage of emitters, what will you do for preventing the blockage of emitters occurring in your irrigation scheme? List any three (3) substances or materials that could block the emitters when present in irrigation water. **(5 marks)**

Section II: Attempt any Four (4) questions out of Six (6) (40 marks)

13. Explain four (4) possible individual methods of extension that are used for agricultural extension. **(10 marks)**
14. The volume of water in the root zone keeps on fluctuating. The available water will depend on content of the soil in water at field capacity and wilting point. Clearly differentiate field capacity, wilting point and available water. Give three (3) factors affecting the water fluctuation in root zone. **(10 marks)**
15. Mister Mugabo is a model farmer at Gatsibo District. He wants to grow tomatoes in green house and Onions in open field. But the insufficiency of rainfall affects negatively the yield, and you are called as agricultural technician to help that farmer. What suggestions should you give him? **(10 marks)**
16. A successful drainage of wet area depends on a correct diagnosis of the typical problems.
- a) Clearly, explain how adequate drainage is a solution to waterlogging and salinization problems of irrigated lands. **(5 marks)**
- b) Drainage coefficient of a land is 10 mm. Calculate the discharge capacity required at outlet end of drainage ditch draining a watershed of 300 ha. **(5 marks)**
17. Most times some regions of our country suffer from rainfall lack which is the principal source of water for crop growth. For that, a yield decreases gradually and famine increases day per day. The way of handling that problem is to use supplement water from rivers, lakes, oceans and wells, through different irrigation methods.
- a. Give and explain three (3) commonly used methods of irrigation.
- b. Apart from these common methods, explain simple irrigation and justify the reason why it is not successful when irrigating large areas.
- c. In which conditions is this simple method advised? **(10 marks)**

18. Mister Kanani wants to irrigate 2 ha of Maize crop, but rainfall is not enough to cover the maize water needs. To solve this problem, he decides to attempt Sprinkler irrigation method. As a technician, you are invited to help him to identify the required tools and materials and to demonstrate how to install and operate sprinkler irrigation method.

(10 marks)

- a)** Identify the tools and materials could you select.
- b)** Demonstrate him how to install and operate Sprinkler irrigation.

