



**NATIONAL EXAMINATION  
AND SCHOOL INSPECTION  
AUTHORITY**

**Tuesday, 27/7/2021**

**08:30 - 11:30 AM**

**Names:**

Index number

**TVET NATIONAL EXAMINATION, RTQF LEVEL 5, 2020-2021**

**QUESTIONS and ANSWERS BOOKLET**

OPTION/TRADE: **FORESTRY**  
SUBJECT: **Forest Exploitation**  
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: FORESTRY**

**SUBJECT: Forest Exploitation**

**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.***

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

- 01.** When the stem of felled tree is very long; it is divided into different parts. This operation is called 'log bucking or cross-cutting'. What are primary objectives of cross cutting? **(5 marks)**
- 02.** Rwanda mountain tea has a forest plantation of eucalyptus maidenii planted in 1980. That forests plantation has 90ha. The forest manager of Rwanda mountain tea would like to carry out a forest inventory through different sample plots established within that forest plantation. As fixed by the forest manager, the used sampling rate was 15% and each sampling plot measures 0.20ha.
- a) Calculate the number of sampling plots to install within that forest plantation.
  - b) What are the factors influencing the sizes (dimensions) of sampling plot? **(5 marks)**
- 03.** Normally, forest harvesting methods refer to the form in which wood is delivered to the logging access road and depend on the amount of processing (e.g. debranching, cross cutting, and debarking). What are the factors affecting the choice of forest harvesting methods? **(5 marks)**
- 04.** Normally, tree felling is the act of making the tree to fall:
- a) Determine the preliminary activities to perform before tree felling.
  - b) List and explain the stages to follow when felling (cutting down) a tree if the preliminary activities to perform before tree felling have been achieved. **(5 marks)**
- 05.** Identify any three (3) advantages and disadvantages for using rail during Timber transport. **(5 marks)**

06. If a forest has 175 trees, and we want to take a sample of 35 trees for a study research of those trees using systematic sampling, what would be interval sample size?  
(5 marks)
07. Outline the processes involved in building earth mound kiln.  
(5 marks)
08. Explain how a charcoal maker benefits from using broadleaved tree species than softwoods.  
(5 marks)
09. Explain the effects of wood charcoal making on the environment.  
(5 marks)
10. Draw alternative measures that can be used to mitigate the use of charcoal.  
(5 marks)
11. Recommend the measures to put in place in order to burn charcoal with respect to environment protection.  
(5 marks)
12. Identify the five (5) maintenances required for sawing tools and equipment.  
(5 marks)

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

13. The forest inventory results have shown that a forest plantation of two (2) ha had the mean annual increment (MAI) of  $15\text{m}^3/\text{ha}/\text{year}$ .
- Calculate the number of steres that can be harvested with that forest considering that the logs pilling coefficient is 0.75.
  - During logs pilling (stacking), what are the factors that can influence the wood volume in steres?
  - List four (4) main factors that influence the increment of forest plantation. **(10 marks)**

14. The human resources department company yoga has 42 workers. In order to find out some information about the group as whole, we want to take a sample of 7 of those workers numbered 1 through 42 and we start at worker 3, which workers would be included in our sample? **(10 marks)**

15. A Forest plantation of *eucalyptus saligna* has been established at Nyaruguru hill in 1950. Four (4) different forestry inventories have been carried out within a sample plot of 1ha during four times: in 2000; 2007; 2012; 2018. The obtained data are recorded as follows.

Inventory	Age class	Volume ( $\text{m}^3$ )
1	10	20
2	15	30
3	25	60
4	35	80

- Calculate:
  - The mean annual increment (MAI) for each age class
  - The current annual increment (CAI) for each age class. **(5 marks)**
- What is your comment about the harvesting time for that forest plantation; is it a time for harvesting or not yet? Explain your answer. **(5 marks)**

16. Using a table, compare Earth Mound Kiln with earth Pit Kiln.

**(10 marks)**

17. Differentiate Earth Kilns from Metal Kilns in terms of monitoring and maintenance.

**(10 marks)**

18. Wood drying refers to reducing the moisture content of wood prior to its use. It is the process of removing its moisture content to an average equilibrium with the atmospheric conditions of the locality of use:

a) Identify any seven (7) advantages of wood drying.

b) Describe any three (3) aspects which depend on the rate of wood drying.

**(10 marks)**





