





# 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 Engineering**

**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.** Define the following terms:

- a) Topography
- b) Contour line
- c) Bench mark
- d) Slope
- e) Altitude.

**(5 marks)**

**02. a)** Identify at least four (4) topographical instruments that can be used for performing topographical data collection. **(2 marks)**

**b)** Among above instruments, list at least two (2) optical and non-optical instruments most used during topographical data collection. **(3 marks)**

**03.** A dumpy level is set up with its eye-piece vertically over a peg A. The height from the top of peg A to the Centre of the eye-piece is 1.540 m and the reading on peg B is 0.705 m. The level is then setup over B. The height of the eye-piece above peg B is 1.490m and a reading on A is 2.195m. What is the difference between level A and B? **(5 marks)**

**04. a)** List out any two (2) topographical instruments for the measurement of horizontal distance on the ground. **(2 marks)**

**b)** What are the three (3) different units used to express the slope of land? **(3 marks)**

**05. a)** One presents you a topographic map representing a forest plantation that has been drawn using 1:2500 scale. The surface area of that topographic map is 45cm<sup>2</sup>. What is the surface area of that forest plantation in hectares?

**b)** List at least two (2) other elements of the map that allow us to understand or interpret the topographic map.

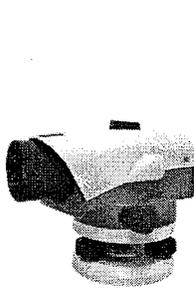
**c)** A particular map shows a scale of 1 cm: 5 km. What would be the map distance (in cm) if the actual distance is 14 km? **(5 marks)**

**06.** For calibrating the average length of his step, a forestry technician has travelled a distance of 100 m for 10times. The obtained results have been recorded as follows: 126, 123, 124, 127, 126, 125, 124, 127, 124 and 124 steps. Then, he has determined the area of the tree nursery using its own steps. At that moment, he had used 150 steps to travel the length and 75 steps for the large of this land.

Calculate:

- a) The average length of this step in meters **(1 mark)**
- b) The perimeter of this tree nursery in meters. **(2 marks)**
- c) The area of this tree nursery in hectares. **(2 marks)**

**07.** Name the following topographical data collection tools and equipment:



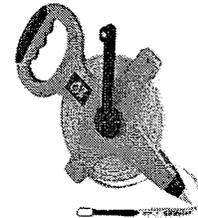
(a)



(b)



(c)

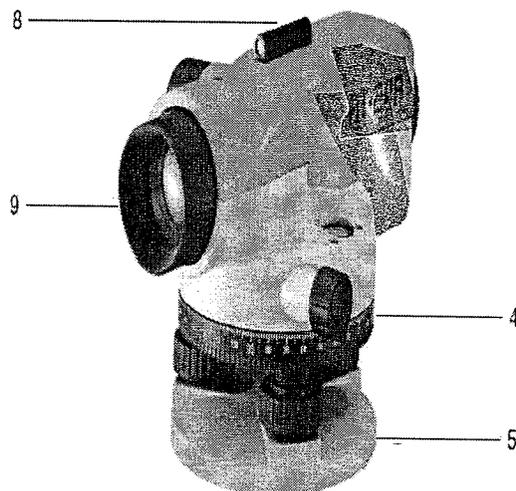
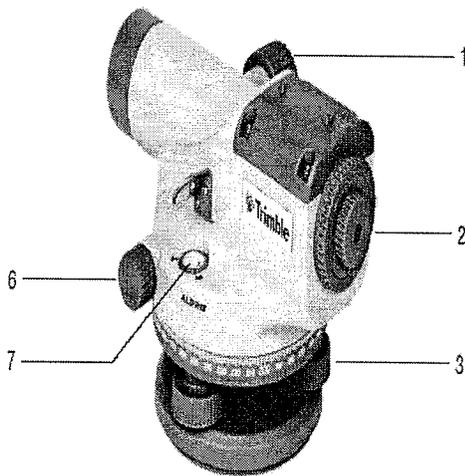


(d)

**(5 marks)**

**08.** Name the parts of the following equipment :

**(5 marks)**



- 09.** During forest pathways/roads construction, identify different forms or shape that may take a travel-way (running surface). Among these forms of travel-way of forest road, which one is not recommended to use in our country? **(5 marks)**
- 10.** Outline at least five (5) functions/roles of constructed forest roads. **(5 marks)**
- 11.** Outline at least ten (10) tools and equipment mostly used during forest path way/ road construction. **(5 marks)**
- 12.** a) Identify the objective of constructing the bench in the stones.  
b) List the instructions to follow and frequent mistakes that often occur during construction of bench in the stones. **(5 marks)**

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

- 13.** On a map, a length of 5 cm represents actual distance of 1km, calculate:  
a) The scale of the map in the form of 1: n **(3 marks)**  
b) The actual distance in km represented by 12km on the map **(4 marks)**  
c) The area of the map in cm<sup>2</sup>, which represents an actual area of 5km<sup>2</sup> **(3 marks)**
- 14.** The following staff readings were observed successively with a level, the instrument having been moved after 3<sup>rd</sup>, and 6<sup>th</sup>, 8<sup>th</sup> readings. 2.230, 1.605, 0.990, 2.090, 2.865, 1.260, 0.600, 1.980, 1.095, 2.685, if reduced level (RL) of bench mark (BM) is 432.385m from where 1<sup>st</sup> reading was taken.  
a) Enter the above readings and Calculate the height of instrument at each station **(3 marks)**  
b) Determine the reduced level of all point. **(5 marks)**  
c) Perform arithmetic check. **(2 marks)**

- 15. a)** List out any five (5) among the standards measurements that must be respected during the forest roads/pathways construction.
- b)** List five (5) categories of staff observed on yard for forest road/pathway construction. **(10 marks)**

- 16.** A forest technician of your sector has collected the topographical data of the sector forest plantation by travelling the perimeter of that forest plantation. He measured the distances and slope for each forest side. The data are recorded into the table below:

Point N <sup>o</sup>	Inclined distance	Slope	Observation
1 to 2	35m	14%	Starting point
2 to 3	45m	12degrees	
3 to 4	39m	20grades	
4 to 1	40m	60degrees	Ending point

- a)** Calculate the horizontal distance (in meter) for each side.
- b)** List down any four (4) required instruments for performing that task (collecting all those data). **(10 marks)**
- 17.** Identify the stages to follow during forest construction if the definitive picketing has been finished. **(10 marks)**
- 18.** A yard of a forest road construction is composed by five (5) categories of workers, such as the forest technician engineer, forest technician, chief of team leader, team leader, and workers. What are the competences (attributions) for?
- a)** Forest technician
- b)** Chief of team leader. **(10 marks)**



