

NATIONAL UNIVERSITY OF SCIENCE AND TECHNOLOGY



FACULTY OF ENVIRONMENTAL SCIENCE

DEPARTMENT OF FOREST RESOURCES AND WILDLIFE MANAGEMENT

FOREST MENSURATION (EFW 4101)

Main Examination Paper

December 2024

This Examination Paper consists of 2 pages

Time Allowed: 3 hours

Total Marks: 100

Special Requirements: NIL

Internal Examiner: Dr A. Chichinye

External Examiner: Prof. E. Chivandi

INSTRUCTIONS

1. Answer **QUESTION ONE** and any **THREE** others
2. Each question carries 25 marks
3. Use of calculators is permissible

MARK ALLOCATION

QUESTION	MARKS
1.	25
2.	25
3.	25
4.	25
5.	25
6.	25
TOTAL	100

1. Describe in detail the determination of the following:
 - (a) volume under bark of standing trees. [12 marks]
 - (b) log volume. [13 marks]
2. Give a detailed explanation on how you would:
 - (a) Determine the form factor of a new species in your country. [15 marks]
 - (b) Discuss the sources of variation in form factor. [10 marks]
3. (a) Explain fully how you would calculate the volume of crown surface area. [10 marks]
(b) Describe any three stem diameter distributions and their implications in forest conservation. [15 marks]
4. Explain fully how trigonometric and geometric principles can be used to measure tree height. [25 marks]
5. (a) Describe any three methods of calculating numbers of stems per hectare. [15 marks]
(b) Explain how you would construct the Mean Annual Increment and Current Annual Increment curves of a 40-year-old *Pinus taeda* stand. [10 marks]
6. With the aid of examples, give a detailed explanation of the procedures involved in determining stand basal area. [25 marks]