BINDURA UNIVERSITY OF SCIENCE EDUCATION

FACULTY OF AGRICULTURE AND ENVIRONMENTAL SCIENCE

DEPARTMENT: NATURAL RESOURCES

PROGRAMME: BSc FOREST AND ENVIRONMENTAL MANAGEMENT

NRF 203: FOREST INVENTORY

DURATION: 2 hrs

TOTAL MARKS: 70

INSTRUCTIONS TO CANDIDATES

Answer THREE questions out of the following five questions. You must answer question ONE from SECTION A and any TWO questions from SECTION B.

SECTION A (COMPULSORY)

1. (a) Distinguish between the following:

   i. Fixed and flexible sampling units [2 Marks]
   ii. Form Factor and taper [2 Marks]
   iii. Newton's formula and Smalian's formula [2 Marks]
   iv. Diameter measurement using a caliper and a diameter tape [2 Marks]
   v. Clinometer and hypsometer [2 Marks]

   (b) Explain the information required before forest inventory field work. [10 Marks]

   (c) Describe precautions for tree height measurement. [10 Marks]

SECTION B

2. An inventory was carried out in a 9.0 ha stand. Six sampling units were assessed. Each sample plot had a radius of 11.3 m. General form factor for the species is 0.4. Below is a summary of the measurements:

Diameter class (cm)	number of trees	Height (m)
21	24	25
23	17	25
25	19	26
27	12	28
29	10	27
31	7	27
33	3	27

Calculate:

i. Average dbh using Squaring method [5 Marks]
ii. Basal area/ha [5 Marks]
iii. Volume/ha [5 Marks]
iv. The sampling intensity used [2 Marks]
v. Dominant height [3 Marks]

3. Discuss the principles of point sampling. [20 Marks]

4. Discuss how carbon storage is estimated in pure and mixed forest stands. [20 Marks]

5. (a) With the aid of diagrams, show points of measurement for tree diameters in forest stand inventories. [10 Marks]

(b) Explain how to determine form factor of a particular tree species. [10 Marks]