BINDURA UNIVERSITY OF SCIENCE EDUCATION

FACULTY OF AGRICULTURE AND ENVIRONMENTAL SCIENCES
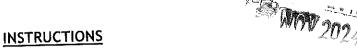
DEPARTMENT: NATURAL RESOURCES

PROGRAMME: BSc FORESTRY AND ENVIRONMENTAL MANAGEMENT

COURSE CODE: NRF 203(1): Forest Inventory

DURATION: 2 HOURS   **TOTAL MARKS: 70**

INSTRUCTIONS

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 the following terminologies:
    i.   Point sampling and random sampling   [2 Marks]
    ii. Fixed plot and flexible plots   [2 Marks]
    iii. Multistage sampling and Cluster sampling   [2 Marks]
    iv. Absolute and relative form factor   [2 Marks]
    v.   Carbon stock and carbon concentration   [2 Marks]

    b. List any four methods used to determining age of trees.   [4 Marks]

    c. Explain precautions for taking diameter measurements with a
       diameter tape.   [10 Marks]

    d. Estimate the taper of the following logs: [6 Marks]

Log number	D (cm)	d (cm)	L (m)
1	28.3	16.7	4
2	32.1	28.2	4
3	25.6	15.5	4
4	45.3	44.2	4
5	15.1	13.6	4
6	21.8	19.7	4

2. a. Explain the significance of diameter at breast height (DBH) in forest inventory. **[4 Marks]**

   b. The following trees were measured from three sample plots (0.04ha each) taken in a 3 ha stand:

12.5	13.2	7.3	11.0	14.1	13.6	9.8	11.7	8.9	10.0
6.1	15.4	14.3	18.1	16.2	14.6	11.3	8.8	7.6	16.3
8.3	15.2	9.91	17.3	13.5	11.7	14.3	13.9	12.2	13.2
12.7	13.0	14.2	16.4						

   i. Classify the trees into 2 cm diameter classes. **[6 Marks]**
   ii. Find the mean diameter using the squaring method. **[6 Marks]**
   iii. What was the sampling intensity used? **[4 Marks]**

3. a Explain the role of forest inventory in sustainable forest management. **[5 Marks]**

   b. Discuss the methods of measuring tree height in forestry and evaluate their advantages and disadvantages (excluding the rough methods). **[15 marks]**

4. a. Discuss the components of a forest inventory plan. **[15 Marks]**

   b. Using a hypothetical example, explain how to estimate the height of a tree using the shadow method. **[5 Marks]**

5. a. Distinguish stand models from individual tree models. **[5 Marks]**

   b. Explain in detail the steps to be taken to determine the form factor of a particular species. **[15 Marks]**

END OF PAPER