



NATIONAL UNIVERSITY OF SCIENCE AND TECHNOLOGY
FACULTY OF SCIENCE AND TECHNOLOGY EDUCATION
DEPARTMENT OF TECHNICAL AND ENGINEERING EDUCATION AND TRAINING
PTE 6387 ADVANCED WOOD PROCESSING

Main Examination

November 2024

This examination paper consists of 3 pages.

Time Allowed: 3 Hours
Total Marks: 100
Examiner's Name: Mr.T. Muzari
External Examiner: Dr. C. Kahanji

INSTRUCTION AND INFORMATION TO THE CANDIDATE

1. Answer **Question 1(compulsory)** and any other three.
2. Each question is worth 25marks.
3. Use of calculators is permissible.

MARK ALLOCATION

QUESTION	MARKS
1	25
2	25
3	25
4	25
5	25
Total marks attainable by the candidate	100

Question 1

Explain the following concepts about wood material processing:

- a) primary and secondary sawing [5]
- b) breeding and selection technology for softwood [5]
- c) round wood [5]
- d) conditioning of surfaces for finishing [5]
- e) loss factor in wood processing [5]

Question 2

- a) Explain the concept of "finish performance" in wood finishes. [5]
- b) Identify and explain factors that affect finish performance in wood products. [6]
- c) Discuss with examples the following types of wood finishes cure:
 - i. Evaporative. [3]
 - ii. Reactive. [3]
 - iii. Coalescing. [3]
- d) Distinguish penetrating finishes from film-based finishes. [5]

Question 3

- a) Explain the concept of primary wood processing taking consideration of key stages in the process. [6]
- b) Describe the given methods of logging in harvesting wood:
 - i. tree-length. [3]
 - ii. full-length. [3]
 - iii. cut-to-length. [3]
- c) Explain the two methods of lumber grading and the attributes of each method. [10]

Question 4

- a) Discuss Advanced Drying Techniques of Timber.
[5]
- b) Explain thermally modified woods and their competitive advantage as a material. [10]

- c) Give a detailed account of the Wood-fibre-reinforced cement composites and their uses in contemporary times. [15]

Question 5

- a) Differentiate chemical pulping from mechanical pulping of wood. [5]
- b) Explain the process of chemical pulping of eucalypts and the advantages it has over other pulping methods. [10]
- c) Describe the rationale for cooking wood chips in the pulping process. [5]
- d) Critique the essence of breaking down of lignin in the pulping of eucalypts. [5]

END OF EXAMINATION PAPER