



NATIONAL UNIVERSITY OF SCIENCE AND TECHNOLOGY
FACULTY OF ENGINEERING
DEPARTMENT OF FIBRE & POLYMER MATERIALS ENGINEERING
COURSE: PAPER & PULP TECHNOLOGY I
TFE 2205

Second Semester Examination Paper

March 2025

This examination paper consists of 2 pages

Time Allowed: 3 hours

Total Marks: 100

Special Requirements: N/A

Examiner's Name: Mrs N R Ndebele

INSTRUCTIONS

1. Answer **QUESTION ONE** and **ANY THREE** questions.
2. The first fifteen minutes should be spent reading the question paper and making notes.
3. **Do not** open your answer sheet until told to do so.
4. Marks will be awarded for skill in appreciating the scope of questions, clarity of argument and conciseness of presentation as well as for the knowledge displayed by the candidate.

MARK ALLOCATION

QUESTION	MARKS
1	25
2	25
3	25
4	25
5	25

QUESTION 1

- a. Define the following terms:
- (i) Pulping [2 Marks]
 - (ii) White liquor [2 Marks]
 - (iii) Accepts [2 Marks]
 - (iv) Black liquor [2 Marks]
 - (v) De-inking [2 Marks]
- b. Discuss the wood yard operations in detail. [15 Marks]

QUESTION 2

- a. Compare and contrast mechanical and chemical pulping processes. [5 Marks]
- b. With the aid of diagrams, discuss the Kraft pulping process. [20 Marks]

QUESTION 3

- a. With the aid of diagrams, describe the refiner mechanical pulping process. [10 Marks]
- b. Discuss the various stages involved during the recycling of waste paper. [15 Marks]

QUESTION 4

- a. Explain how bleaching of pulp can be carried out. [10 Marks]
- b. Bio pulping, which uses natural wood decay organisms, has shown great potential over recent years. Give an account of the bio pulping process, indicating its advantages, disadvantages and challenges that are to be considered. [15 Marks]

QUESTION 5

The chemical recovery system is an integral part of pulp and paper industries. Discuss the following sections of chemical recovery operations in a pulp manufacturing plant:

- a. Evaporation [5 Marks]
- b. Recovery furnace [5 Marks]
- c. Dissolving tank [5 Marks]
- d. Causticizing [5 Marks]
- e. Lime kiln [5 Marks]

END OF EXAMINATION QUESTION PAPER