



NATIONAL UNIVERSITY OF SCIENCE AND TECHNOLOGY

FACULTY OF ENGINEERING

DEPARTMENT OF FIBRE AND POLYMER MATERIALS ENGINEERING

FINISHING OF MATERIALS

TFE 3205

Second Semester Examination Paper

March 2025

This examination paper consists of 3 pages

Time Allowed: 3 hours

Total Marks: 100

Special Requirements: NIL

Examiner's Name: Mr. S. Ncube

INSTRUCTIONS

1. Answer **question 1** and **any three** questions. Each question carries **25 marks**. This paper contains **five** 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 a candidate.

MARK ALLOCATION

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

QUESTION 1

- a. Define the following
- i. Flame retardant [2 Marks]
 - ii. Knurling [2 Marks]
 - iii. Degating [2 Marks]
 - iv. Annealing [2 Marks]
 - v. Annodizing [2 Marks]
- b. List 5 types of flame retardants [5 Marks]
- c. Metals can be finished using different methods.
- i. Describe how hardening is carried out and the effect the finishing process has on the molecular structure of the metal. [5 Marks]
 - ii. Describe how tempering is carried out and the effect the finishing process has on the molecular structure of the metal. [5 Marks]

QUESTION 2

- a. Different chemicals have been used for antimicrobial treatments for different materials. Explain the antimicrobial mechanism of the following. Give examples of the application areas:
- i. Zinc [5 Marks]
 - ii. Copper [5 Marks]
- b. Discuss the following classifications for antimicrobials finishes
- i. Rot-proof [5 Marks]
 - ii. Hygiene finishes [5 Marks]
 - iii. Aesthetic finishes [5 Marks]

QUESTION 3

- a. Discuss the mechanism for a flame retardant [10 Marks]
- b. Transfer printing is a form of printing that can be used by transferring a design from the printing medium onto the substrate. Describe 3 screen printing methods [15 Marks]

QUESTION 4

Discuss the various methods used for producing designs on a screen in screen printing. In your response, explain each method in detail, highlighting its process, advantages, and specific applications. Provide examples where applicable. [25 Marks]

QUESTION 5

Finishing of products is carried out for different reasons. Describe 5 reasons for carrying out finishing while giving examples. **[25 Marks]**

END OF EXAMINATION QUESTION PAPER