

NATIONAL UNIVERSITY OF SCIENCE AND TECHNOLOGY

DEPARTMENT OF TEXTILE TECHNOLOGY

END OF SECOND SEMESTER EXAMINATIONS AUGUST 2009

TXT 2221 - CHEMICAL ANALYTICAL AND TESTING TECHNIQUES

TIME: 3 HOURS

INSTRUCTIONS

Answer **ANY FIVE** questions. Each question carries **20 marks**.

QUESTION 1

There are a number of methods available for the identification and characterisation of textile and polymeric materials. Discuss. **(20)**

QUESTION 2

Outline the principles of an optical microscope.

- i. Explain the procedure for preparing samples for microscopic examination.
- ii. Explain four important textile product properties that depend on fibre gross morphology. **(20)**

QUESTION 3

A Scanning Electron Microscope (SEM) is a versatile instrument that can be used in textiles and forensic investigations. Explain its versatility and how it can be used. Give examples where it is used. **(20)**

QUESTION 4

Explain how you would identify four (4) fibres of your choice. (Your answers must be supported by clear diagrams). **(20)**

QUESTION 5

Discuss the principles of Infrared Spectroscopy and Nuclear Magnetic Resonance Spectroscopy. Briefly outline how these tools are used in textile materials structure elucidation. (20)

QUESTION 6

Write short notes on the following:

- i. Gel Permeation Chromatography
- ii. Viscometry
- iii. Thermal Gravitational Analysis
- iv. X-ray diffraction (20)

END OF QUESTION PAPER

