NATIONAL UNIVERSITY OF SCIENCE AND TECHNOLOGY

DEPARTMENT OF TEXTILE TECHNOLOGY

END OF SECOND SEMESTER EXAMINATIONS AUGUST 2009

TXT 2216 TEXTILE PRINTING AND COLOUR SCIENCE

TIME: 3HOURS

<u>INSTRUCTIONS</u>

Answer Three (3) questions from Section A and any Two (2) questions from Section B. Each question carries 20 marks.

Section A (Printing)

<u>Question 1</u>

List and explain the function(s) of the various chemicals that can be found in a pigment print recipe formulation **(20)**

<u>Question 2</u>

Give a detailed explanation why pigment printing has become increasingly important in recent years. **(20)**

<u>Question 3</u>

Write notes on any two (2) of the following

> a. Transfer printing methods.
> b. Resist printing
> c. Fixation methods in printing
> d. Thickeners
> e. Printing of polyester/cotton blends. 10marks each **(20)**

<u>Question 4</u>

Give detailed technical and economic merits of using either flatbed screen-printing or rotary screen-printing in printing of textile fabrics. **(20)**

Section B (Colour Science)

Question 1

(a) Explain why colour measurement is important in the colouration industry. **(5)**

(b) What is metamerism and how does it affect colour measurement results? **(5)**

(c) State Beer-Lambert Law. Applying Beer-Lambert's Law, calculate the molar coefficient of extinction (ε) of a dye whose solution at a concentration of 10^{-5}M gives an absorbance of 1.8 at lamda max(λ) in a cell of pathlength of 2cm. **(10)**

Question 2

Sketch the arrangement of the optical components of a reflectance spectrophotometer that is suitable for colour measurement and explain its principle of measurement. **(20)**

Question 3

(a) With the aid of a clearly labelled diagram describe the function of the major features of the human eye in the visual process. **(10)**

(b) Give the Kubelka-Munk equation relating to the percentage of light reflected to dye concentration. Explain the usefulness and limitations of this equation in colour measurement. **(10).**

END OF QUESTION PAPER