

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

INSTRUCTIONS

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

Section A (Printing)

Question 1

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

Question 2

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

Question 3

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)**

Question 4

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 $\lambda_{\text{max}}(\lambda)$ 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