

NATIONAL UNIVERSITY OF SCIENCE AND TECHNOLOGY

**DEPARTMENT OF TEXTILE TECHNOLOGY
SUPPLEMENTARY EXAMINATIONS AUGUST 2004
TEXTILE DYEING TXT 2116
TIME: 2HOURS 30MINUTES**

INSTRUCTIONS

Answer any 5 questions .Each question carries 20 marks

1. (a) Write a brief account of the different modes of dye-fibre attachments. List specific examples of the effects on different dye classes on different fibres and the respective modes of attachments. (10 marks)
- (b) Write short notes on the following:
- The properties of azoic dyes on cellulose. (4 marks)
 - Why sulphur dyes are still important in the dyeing of cellulose. (4 marks)
 - Environmental considerations of dyeing cellulose with sulphur dyes. (2 marks)
2. Write short accounts on the following, with special reference to the underlying science:
- the use of caustic soda solutions in the preparation of natural cellulosic textiles subsequent to colouration. (5 marks)
 - the use of thermal treatments in the preparation of synthetic fibres for subsequent colouration. (5 marks)
 - Given the following:
Weight of fabric 1000 kilograms
Weight of liquor 30 000 litres
Amount of dye used 20 kilograms
Percentage of electrolyte used
Calculate:
(i) percentage depth of shade
(ii) the liquor ratio

(iii) amount of electrolyte used (10 marks)

3. Write an account of the dyeing of polyester fibre/fabrics with disperse dyes. Include in your answer details of the dyeing mechanism and properties of the dyeing and explain the influence that fibre heat-treatments can have on disperse dye uptake. (20 marks)
4. Discuss in detail the bleaching of cellulose fibre/fabrics using hydrogen peroxide. Your discussion must account for reasons for the various components (additives) used, the problems that may be encountered and how these problems can be eliminated.
5. Compare and contrast direct and acid dyes. Your comparison must consider the following aspects: the dye chemistry, modes of dye fibre attachments, suitable substrates, dyeing methods and fastness properties. (20 marks)
6. With aid of drawings, outline the major features of two (2) machines available for dyeing woven fabrics. Your outline must show clearly the modes of circulation of either the liquor of the fabric or both. (20 marks)

END OF QUESTION PAPER