

NATIONAL UNIVERSITY OF SCIENCE AND TECHNOLOGY

DEPARTMENT OF TEXTILE TECHNOLOGY
END OF SEMESTER EXAMINATIONS JUNE 2004
TEXTILE FINISHING TXT 2219
TIME: 3 HOURS

INSTRUCTIONS

Answer **ALL** questions from Section A and **ANY 3** from section B. Section A carries 40 marks and each question in section B carries 20 marks. Allocate 60 minutes to section A and 120 minutes to section B.

SECTION A

Answer **ALL** questions in this section.

1. (a) Starting with urea, write down an equation sequence that leads to the formation of fully methylated DMDHEU. (7 marks)
- (b) Explain with an example, what you understand by the term extender. (3 marks)
2. (a) Calculate the % expected add-on given that a roll of fabric weighted 150 kg dry and 195kg after wet processing treatment. The bath concentration was 30%. (3 marks)
- (b) Starting with a triglyaride of your choice write down an equation showing the production of an anionic softener. (7 marks)
3. (a) Define the critical micelle concentration. (3 marks)
- (b) Explain what the structure of a surfactant is like and how, as a consequence, the surfactant aligns itself at the interface of surfaces with differing polarity. (4 marks)
- (c) How is water's surface tension measured and what is its value? (3 marks)
4. (a) Why is it sometimes essential to apply nondurable hand builders to fabrics. (3 marks)
- (b) A stenter is a multifunctional piece of equipment in a finishing plant. Discuss the statement giving as many examples of uses of a stenter. (4 marks)
- (c) Explain with equations what causes fish odour in some finished fabrics. (3 marks)

SECTION B

Answer Question 1 and any other 2 in this section

1. Physical; and/or chemical processing of cotton fabrics can impart easy care properties on cotton fabrics. Discuss the nature of these easy care properties, together with the processes and machines necessary to deliver them. Include in you discussions the relative merits of each of the application processes.
(20 marks)
2. (a) What are hand builders? Give as detailed an account as you can of durable hand builders (10 marks)
(b) Discuss carpet antisoiling treatments. (10 marks)
3. (a) Discuss the nature of textile combustion and the methods/mechanisms used to impart flame retardancy to cotton and polyester fabrics.
(15 marks)
(b) Compare and contrast the properties of anionic and cationic softeners.
(5 marks)
4. (a) What is a Lewis Acid catalyst? Show the mechanisms of catalysis in cross-linking reactions. Explain why most finishers prefer the use of L Lewis Acid catalysts. (12 marks)
(b) Discuss how chemical modifications or finishes reduce static build up in polyester fabrics. (8 marks)
5. (a) Explain with examples how cationic softeners can be made from the following classes of compounds:
 - amino esters
 - amino amides
 - fatty amines
 - quaternary ammonium salts
(b) Explain the phenomenon of migration in the context of drying. (2 marks)
(c) What normally causes yellowing in finished goods? (3 marks)

END OF QUESTION PAPER
