Examination Period 3: 2017/18

LEA200118N

Module Title: Leather Technology 2
Level: Five
Time Allowed: Three hours

Instructions to students:

• Enter your student number not your name on all answer books.
• Answer five questions: one from Section A and four questions from Section B.
• All questions carry equal marks. Where a question is in parts the weightings are indicated.
• Neither books nor notes may be taken into the examination.
• The use of a non-programmable calculator is permitted.

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Section A:

Answer one out of two questions.

Question 1

a. There are different aspects involved in the drying of leather, both physical and chemical. Explain the following;

i. First phase and second phase evaporation

(4 marks)

ii. How drying influences the physical properties of leather

(6 marks)

b. For profitability, the highest quality/value and cutting value must be developed (across all parts of the hide/skin).

i. Explain the key parameters (including chemical and mechanical operations) that may assist production of a flatter leather with uniform properties?

(5 marks)

ii. Suggest how processing a full hide as opposed to cutting into sides may also assist to achieve a leather with uniform properties?

(5 marks)

Total: 20 marks

Question 2

In modern leather manufacture, drums are most commonly used as processing vessels where chemical reactions take place. Drums are also applying serious forces through the operations, and therefore drum configurations do influence the properties of leather.

a. List four different internal constructions of Drums.

(2 marks)

b. What effects do the different drum constructions have on the skins and leather making processes and how does the internal drum configuration influence the mechanical action.

(18 marks)

Total: 20 marks
Section B

Answer four out of six questions.

Question 3

a. List five important properties required for automotive leathers.
   (5 marks)

b. Explain the critical points in making wet white automotive upholstery leather from salted cow hide to dried crust for a full grain finish.
   (10 marks)

c. Compare the suitability of chromium, vegetable and wet white tannages for the production of automotive leather.
   (5 marks)

Total: 20 marks

Question 4

a. Explain the purpose of retanning (not dyeing or fatliquoring).
   (5 marks)

b. List five different types of retanning agents (not dyes nor fatliquors) with examples.
   (5 marks)

c. Briefly explain how you may adjust re-tanning of a wetblue (not dyeing or fatliquoring), based for two different end uses.
   (10 marks)

Total: 20 marks

Question 5

a. List and describe two methods that may be used to assess waterproof properties of a leather.
   (4 marks)

b. What is the purpose of metal capping in the production of water resistance leather?
   (3 marks)

c. Which metal salts are commonly used for metal capping?
   (3 marks)

d. Which important factors need to be considered when processing waterproof leather
   (10 marks)

Total: 20 marks
Question 6

a. Looseness can significantly reduce the value of a leather. Explain what causes looseness in final leather (you should consider raw material characteristics as well various processing stages).

(10 marks)

b. Explain how pH influences both penetration and fixation of dyes for a chrome-tanned shoe upper leather.

(10 marks)

Total: 20 marks

Question 7

a. List five most desired properties required from garment leathers.

(5 marks)

b. Explain the crucial factors you may need to consider when processing garment leathers from cow hide.

(15 marks)

Total: 20 marks

Question 8

a. Why is the stripping operation usually carried out for vegetable tanned leathers before post-tanning operations?

(1 mark)

b. Name two chemicals (not water) that are used for stripping.

(2 marks)

c. Name two chemicals (not water) used for removing iron stains from leather.

(2 marks)

d. Explain the impact of temperature on the vegetable tanning process.

(5 marks)

e. Define and classify vegetable tannins with examples.

(4 marks)

f. Explain the mechanisms of vegetable tanning.

(6 marks)

Total: 20 marks

End of Section B
End of Paper