

Cork Institute of Technology

Bachelor of Science in Food Science and Technology - Award

(NFQ - Level 7)

December 2005

Food Chemistry (Time: 3 Hours)

Answer five questions

Answer four questions from Section A.

Answer one question from Section B.

Please use separate answer books for each section.

All questions carry equal marks.

Examiners:

Mr. E. Fitzgerald

Dr. M. Lehane

Dr. T. Beresford

Section A

- Q1. Write an account of Starch Gelatinisation and discuss its importance in foods.
(20 marks)
- Q2. Write short notes on three of the following:
a. Safety with acids in the laboratory
b. Safety with solvents
c. Electrical safety
d. Carcinogenic chemicals
e. Teratogenic chemicals
(20 marks)
- Q3. Discuss the role of diet and lifestyle in promoting health and avoiding disease.
(20 marks)
- Q4. Discuss the problem of rancidity in foods and outline the means by which it may be controlled in food processing.
(20 marks)
- Q5. Write short notes on three of the following:
a. Nutrition during pregnancy
b. Nutrition of infants to the age of twelve months
c. Anaemia and its dietary management
d. Coeliac disease and its dietary management
e. Nutrition for rugby players
(20 marks)
- Q6. What mass of sodium ethanoate (purity: 76%) and what volume of ethanoic acid, (M.W.: 60, purity: 93%, specific gravity: 1.08, K_a : 1.8×10^{-5}) should be taken to make 1350ml of 0.75M buffer of pH 4.35?
(20 marks)

- Q7. Discuss the importance of protein denaturation in food preparation and food processing. (20 marks)
- Q8. Discuss the importance of emulsions in food preparation and food processing. Using products from the food, biopharmaceutical or cosmetic sectors as examples, discuss the roles of emulsifiers and stabilizers. (20 marks)

Section B

- Q9. 'One of the major impediments to the determination of target trace components in food is the potential interference of complex matrix constituents.'
Discuss this statement in the context of a strategic approach to experimental design. (20 marks)
- Q10. Suggest viable instrumentation based approaches to the following analytical problems:
- The determination of trace levels of lead (Pb) in samples of canned tuna.
 - The determination of the vitamin X content in a given brand of breakfast muesli (vitamin X possesses several regions of conjugation and a strong chromophore in its structure).
 - The comparison of a range of volatile congeners in several brands of Irish whiskey.

In each case explain the general principles of the analytical method and its relative merits and limitations, include in your answer the most appropriate preliminary chromatography technique (if applicable). (20 marks)