Mastership in Chemical Analysis

Part B Examination

Paper 1

Burlington House

Tuesday 11 October 2016

13:00 – 16:00
Instructions

Answer **five** questions out of eight.

The answers to each question must be returned in the examination script booklets provided. All examination scripts must be handed in at the end of the examination.

The marks allocated to each question are given.

**Unless otherwise stated, references to Statutes in England include the equivalent alternatives for Scotland, Wales and Northern Ireland.**

**Unless otherwise stated, any reference to Statutes includes the EU regulations that they enforce.**

1. What do you understand by the following terms;

   (a) Bulking agent
   (b) Carrier
   (c) Colouring Food
   (d) Natural flavouring
   (e) Flour improver

   **(1 mark each – total of 5 marks)**

   Detail the analytical approaches to determining the concentrations of artificial colours in food.

   **(15 marks)**

2. (a) Describe how you would assess levels of arsenic in food. Include in your answer a reference to relevant legislation and sources of the contaminant.

   **(10 marks)**

   (b) Detail how you would analyse for arsenic and its toxic species.

   **(10 marks)**
3. (a) Outline the main requirements of the current legislation relating to the labelling and composition of olive oil

(b) Briefly explain how you would analyse olive oil for the following

   (i) Extinction (K value)
   (ii) Acidity
   (iii) Linolenic acid
   (iv) Peroxide value

   (2 marks each – total of 8 marks)

4. (a) Describe how you would analyse food for both polychlorinated biphenols (PCBs) and dioxins.

   (12 marks)

(b) What do you understand by the following terms:

   TEQ
   Upper bound level
   Lower bound level

   (8 marks)

5. Briefly outline how you would analyse for five of the following and the significance of the result with regard to food legislation

   (a) Tartaric acid in wine
   (b) Sesame oil in tahini paste
   (c) Phosphatase in milk
   (d) Moisture in flour
   (e) Fluoride in tea
   (f) Alcohol content of liqueur spirit
   (g) Sulphur dioxide in dried apricot
   (h) Egg in mayonnaise

   (4 marks each – total of 20 marks)
6. Outline the methods used in an official food control laboratory to determine the presence of the following micro-organisms.

(a) Salmonella
(b) Listeria
(c) Enterobacteriacea
(d) VTEC
(e) Campylobacter

(4 marks each – total of 20 marks)

7. Discuss how and why food is irradiated, what tests are available to detect it and the legislation applicable for its use.  

(20 marks)

8. What are the main sources of the following contaminants and their implications for human health?

(a) Aflatoxins
(b) Lead
(c) Acrylamide
(d) Bacillus cereus
(e) Histamine

(4 marks each – total of 20 marks)

END OF PAPER