ROYAL SOCIETY OF CHEMISTRY

Mastership in Chemical Analysis (MChemA)

Regulations, Syllabus and Guidance Notes 2024

Date:	Reason for issue:
February 2024	Updates to the Part B exam guidance and minor updates/ corrections.

CONTENTS

1. Introduction

1.1 Statutory framework

2. The MChemA Examination

2.1 General Information

2.2 Counsellors

2.3 Preparation for the Examinations

2.4 Feedback from the Examinations

2.5 Training Courses and Guides

2.6 Location of the Examinations

2.7 Meetings

3. Registration

3.1 Registration of Interest

3.2 Registration for the MChemA

4. Part A

4.1 Part A Registration, Examination and Guidance

4.2 Timescales

4.3 Analytical Methods and Techniques Syllabus for Part A

4.4 Part A Booklist

5. Portfolio and Regular Submissions

5.1 Introduction and Regular Submissions

5.2 Portfolio Composition

5.3 Submission of portfolio

5.4 Interview

5.5 Portfolio Guidance

5.6 Marking of the Portfolio

6. Part B

6.1 Regulations for Part B

6.2 Timescales

6.3 Part B Examination

6.4 Part B Statement of Intent

6.5 Syllabus for Part B

6.6 Guidance Notes for Part B

7. Part C

7.1 Registering for Part C

7.2 Timescales

7.3 Part C Statement of Intent
7.4 Syllabus for Part C
7.5 The Practical Examination
7.6 Guidance Notes for the Practical Examination
7.7 Expectations of the Assessors
7.8 Part C Booklist

8. Guidance Notes for Counsellors

8.1 Introduction
8.2 Requirements for the Counsellors
8.3 Regular Evidence
8.4 Part A
8.5 Portfolio
8.6 Part B
8.7 Part C

9. Award of the MChemA

10. Continuing Professional Development

11. MChemA Application Documents

12. Contact for Further Information

1 Introduction

The Mastership in Chemical Analysis (MChemA) is the statutory qualification for anyone wishing to be appointed by the Local Enforcement Authority in the UK to the position of Public Analyst. Once awarded, a holder is qualified to be a Food Analyst and can become qualified to be a Food Examiner and an Agricultural Analyst.

An MChemA holder will be competent in matters relating to the chemistry, microbiology, microscopy of, and the law relating to food, water, and agricultural fertilisers and feeding stuffs.

1.1 Statutory Framework

Every Food Authority must appoint one or more Public Analysts under Section 27 of the Food Safety Act 1990 and an Agricultural Analyst and, if they see fit, one or more Deputy Agricultural Analysts under Section 67 of the Agriculture Act 1970.

Public Analyst

The MChemA is the statutory requirement of competency for the appointment of Public Analysts, as set out in the following:

The Food Safety (Sampling and Qualifications) (England) Regulations 2013

(There are separate Regulations for Scotland, Wales and Northern Ireland)

Qualifications of analysts

4. A person shall be qualified to be a food analyst or a Public Analyst if that person possesses a Mastership in Chemical Analysis awarded by the Royal Society of Chemistry.

Food Examiner

There is no single qualification for appointment as a Food Examiner. Regulation 5 of The Food Safety (Sampling and Qualifications) Regulations 2013 is as follows:

Qualifications of Food Examiners

5 - (1) A person is qualified to be a Food Examiner if that person -

(a) before the coming into force of these Regulations, was qualified to be a food assessor….

or

(b) on or after that date,

i. possesses a qualification listed in Part 1 of Schedule 2 [this list includes the MChemA]; and

ii. has carried out examination of food over a period or periods amounting in the aggregate to at least three years in one or more of the laboratories set out in Part 2 of that Schedule.

Because the MChemA qualifies its holder to act as a Food Examiner, food microbiology will normally be examined every year in either or both of the Part B or Part C papers.

Agricultural Analyst

The prescribed qualifications for an agricultural analyst or a deputy agricultural analyst are set out in the Fertilisers (Sampling and Analysis) Regulations 1996 (SI 1996 No 1342). "...he shall possess a Mastership in Chemical Analysis awarded by the Royal Society of Chemistry or be a Chartered Chemist, being a Fellow or Member of the Royal Society of Chemistry, and that his practical experience of the analysis and examination of fertilisers shall be attested by another agricultural analyst…"

There is a similar requirement in the Feed (Sampling and Analysis and Specified Undesirable Substances) (England) Regulations 2010 (SI 2010 No 2280) (and the equivalent Regulations for Scotland, Wales and Northern Ireland) for feeding stuffs.

2 The MChemA Examination

2.1 General Information

The syllabus addresses the requirements for scientific control of the whole food chain. Agricultural analysis is therefore included, as well as the science of water as far as it impacts on food preparation and direct consumption. Candidates may be examined in any aspect of the statutory responsibilities of a Public Analyst.

In view of the broad scope of the responsibilities of the present-day Public Analyst it is important that candidates should have adequate experience in a laboratory, such as a Public Analyst's laboratory, or other laboratory concerned with broadly based food, environment, and relevant agricultural matters.

Candidates may not have acquired work experience in all the relevant aspects of duties of a Public Analyst, so may also need formal training and/or attendance at seminars, courses or exchange working in another laboratory. The counsellors should assist candidates in their preparation for the examination.

Candidates will need to demonstrate that they have had a thorough grounding in the general principles underlying analytical chemistry and will have acquired a broad knowledge of relevant disciplines. In this latter respect special emphasis must be given to:

(a) an understanding of the general scientific principles underlying sampling, examination, testing and analysis of a diverse range of materials, and

(b) the interpretation of results obtained, recognising that such activities may lead to legislative or other executive action on the basis of a report made.

The examination is in three parts:

Part A is a three-hour examination paper on the theory of general analytical chemistry.

Part B covers the applications of analytical chemistry in two four-hour examination papers.

Part B will assess the essential core knowledge for the MChemA.

Part C provides the opportunity for candidates to demonstrate specific abilities that they possess in the application of the core knowledge and an opportunity to demonstrate their career experience. They will submit a portfolio of evidence, which is formally assessed by the Assessors, and which must be deemed satisfactory before they can proceed to the one-day practical examination, which is held at a suitable laboratory.

Past examination papers, the application forms, dates of the examinations, closing dates for applications and the current fees are available on the Royal Society of Chemistry (RSC) website at http://rsc.li/mchema. The MChemA exam is overseen by the MChemA Examination Board who meet once in the Spring and again in the Autumn every year, with the MChemA Officer handling the day-to-day activities.

2.2 Counsellors

Candidates are required to nominate two counsellors (internal and external), for approval by the RSC. The internal counsellors should normally be a senior member of their own laboratory. The external counsellor must hold the MChemA and work in another laboratory. If a candidate is having difficulty in nominating a counsellor, they should contact the RSC for advice. The RSC should also be kept informed of any changes to a candidate's counsellors.

Full details on the requirements for counsellors, as well as guidance notes for counsellors can be found in section 8, but their primary role is to assist the candidate in planning their studies and in improving their laboratory techniques and analytical knowledge. Counsellors should be able to advise candidates when they are ready to take the examinations for each part of the MChemA.

It is the responsibility of the candidate to arrange meetings and seek guidance from their counsellors when required. The counsellors are expected to make themselves available to the candidates were reasonably possible.

2.3 Preparation for the Examinations

Before attempting each part of the examination, candidates are recommended to answer some specimen questions and have these scrutinised by their counsellors. Answers should be structured, written legibly and concisely in good English and should demonstrate a critical scientific attitude.

Candidates should be sure to address the question asked and do not be drawn into discussing a related topic simply because they know more about it or are especially familiar with it from their own work experience. Assessors will only award marks for information that is relevant.

The style of the question will provide guidance on how much detail is required in the answer. If the question has two or more parts, the marks available for each part are stated. For example, this single part question requires a structured essay:

"Discuss the development of standards for nutritional and health claims on food labels. (20 marks)"

In contrast, this 5-part question asks candidates to provide brief descriptions for which they could gain a maximum of four marks for each part:

*Briefly describe the techniques you would use to authenticate **five** of the following:*

(a) King Edward potatoes

(b) Organic pork chops

(c) Earl Grey tea

(d) Heather honey

(e) Star anise (ground)

(f) A post-mix dispensed proprietary diet cola

(4 marks each part, total 20 marks)

"A picture paints a thousand words!" ie include diagrams, where appropriate, since this can be a much more effective way of illustrating something like a control chart than pages of text.

Recent past examination papers are available on the RSC website at http://rsc.li/mchema, and older ones are available on request.

2.4 Feedback from the Examinations

Should a candidate be unsuccessful when sitting any of the exams, it is possible to receive verbal feedback from the Chief Assessor to help prepare for a resit. This would be arranged *via* the RSC. It would take place as a phone or video call between the candidate, internal counsellor, and Chief Assessor. The purpose of this meeting would not conduct a review/ dissection of examination but to instead focus on what candidates can do for their next attempt.

specific exam questions will not be discussed,

2.5 APA Training Courses and Guides

The Association of Public Analysts (APA) has produced a series of Training Guides and organises training courses to assist candidates in their preparation for the MChemA. The APA Training Committee has also devised a Record of Study and Progress for candidates and counsellors to use to help structure training. This is not formally examined as part of the MChemA examination, but it may be used to ensure that candidates are sufficiently prepared for the examination.

Further details about the courses and guides are available on the APA website at www.publicanalyst.com.

2.6 Location of the Examinations

The Part A examination will be conducted remotely, and candidates will be allowed to take them at either their home or place of work. Full details will be provided to the candidate after registering.

If a candidate would rather conduct the Part A examination in a face-to-face environment, they should inform the MChemA Officer when registering for that exam. Arrangements can be made for them to sit the exam at Burlington House in London.

The Part B examination will be conducted in a face-to-face environment at Burlington House, London.

The location of the Part C examination is not fixed and will be decided each year after receiving all the applications for that year's exam. A suitable location will be decided depending on the "home" location of all candidates and assessors involved.

2.7 Meetings

2.7.1 Candidates and Counsellors Day

During the year there will be at least one Candidates and Counsellors Day, typically after the MChemA Spring Examination Board meeting. This will be an opportunity to help both the candidates and counsellors understand what the assessors are expecting in the exam answers. Candidates and counsellors from all stages of the MChemA as well as those who have registered an interest in the MChemA are welcome. The day will be tailored to those who attend, with attendees able to suggest topics for the meeting, however, priority will be given to those planning to sit exams that year.

2.7.2 Counsellor's Meeting

There will be at least one Counsellor's Meeting a year and typically will follow the Candidates and Counsellors Day. The purpose of this meeting it to provide support and guidance to both new and existing counsellors, through the process of peer-to-peer discussions. This will typically involve the sharing of ideas, tips, and advice.

3 Registration

3.1 Registration of Interest

The Registration of Interest form can be completed by anyone who is interested in the MChemA process. Completing this form does not hold that individual to register for the MChemA or become a member of the RSC and is free of charge. This stage serves as the beginning for prospective candidates who want to be kept up to date with any MChemA activities or events.

3.2 Registration for the MChemA

All registrations and exam applications must be approved by the MChemA Exam Board. To be approved, candidates will typically, be an Associate Member (AMRSC), Member (MRSC) or Fellow (FRSC) of the RSC when they Register for the MChemA and will typically have achieved MRSC or FRSC by the time of application for the Part C examination. Candidates must maintain their RSC membership throughout the period of registration and examination.

The Registration for the MChemA form is for those who have decided to begin the MChemA and

are/have already begun the necessary training. Candidates must have already identified an internal counsellor who should be a senior member of their laboratory (see sections 2.2 and 8). Candidates ideally will have also identified an external counsellor, but this is not mandatory at this stage. If candidates are struggling to identify an external counsellor, they should inform the RSC who will be able to provide assistance. All Registrations forms must be submitted, along with their first evidence submission (see section 5) before the January or August deadline so that they can be reviewed at either the Spring or Autumn Examinations Board meeting.

Candidates are required to detail their relevant skills and experience they have obtained as part of their preparation for the MChemA as well explaining the reasons why they are interested in applying. Candidates should reference their submitted evidence in this section and provide details of the topics covered in their qualifications.

There is a fee which covers the Registration and one attempt at the Part A examination which is payable upon receipt of the Registration for MChemA form. Payment of this fee does not require candidates to take the Part A exam immediately.

In some circumstances the RSC may require candidates attend an interview to assist in its consideration of their application.

There is a time limit for completion of the MChemA of six years from registration. The Examinations Board have the discretion to extend this period.

4 Part A

4.1 Part A Registration, Examination and Guidance

To register for the Part A examinations candidates must have already registered for the MChemA or be submitting a Registration for the MChemA form along with their Registration for Part A form.

To register for the Part A examination, candidates must have identified both an internal and external counsellor (see section 2.2 and 8). If a candidate is registering for a resit, they will have to pay an additional fee.

The Part A examination consists of one paper and candidates are allowed three hours to complete it. They must answer five out of the eight questions with the pass mark being 50%. The examination covers the theory of general analytical chemistry applicable to the role of a Public and Agricultural Analyst. Candidates taking the exam are expected, unless stated otherwise, to have knowledge and understanding of the methods and techniques detailed in section 4.3. The standard that is expected in the answers is that of a postgraduate level.

4.2 Timescale

The Part A registration form must be received by the January deadline. This will be reviewed by the Examination Board at their Spring meeting. If accepted, the candidate will be informed that they can sit the exam. The results will be provided to the candidate within 8 weeks of the exam.

4.3 Analytical Methods and Techniques Syllabus for Part A

Candidates will be expected to be familiar with theory relating to modern chemical analysis, including, but not limited to, the following areas:

- Sampling
- Sample preparation, analyte extraction and pre-concentration procedures
- Calibration, standardisation, QA/QC and validation procedures
- Classical analytical methods, including cryoscopy, gravimetry, refractometry and titrimetry
- Polarimetry
- Spectroscopic methods, including UV/visible, fluorescence, IR and Raman spectroscopy
- Atomic spectrometry, including atomic absorption, atomic emission and atomic fluorescence
- Chromatographic separation techniques including: modern TLC systems, gas chromatography, high performance liquid chromatography and ion chromatography
- Non-chromatographic separation techniques including distillation, electrophoresis, SPE and SPME
- Mass spectrometry, both elemental mass spectrometry (eg ICP-MS) and molecular mass spectrometry
- Hyphenated techniques eg GC-MS, LC-MS
- Electroanalytical techniques including voltammetry and potentiometry
- Radioanalytical chemistry and X-ray based techniques
- Methods for the analysis of DNA
- Enzyme and immunological techniques eg enzyme assays, ELISA.
- Microbiological assay
- Methods for data handling, including statistical analysis, the assessment of measurement uncertainty and simple chemometrics eg PCA
- Recent developments in analytical science

4.4 Part A Booklist

Examination questions may be set on any of the subjects contained within section 4.3. The following books are recommended:

D. A. Skoog, F. J. Holler and S. R. Crouch, *Principles of Instrumental Analysis*, Cengage Learning, Australia, 7th Edition, 2018.

D. Harris, *Quantitative Chemical Analysis*, Freeman, New York, 9th Edition, 2015.
or similar text book or ebook

J. M. Miller and J. C Miller, *Statistics and Chemometrics for Analytical Chemistry,* Pearson Education Ltd, Harlow, 7th Edition, 2018. *Book available as electronic edition*

J. M. Jay, M. J. Loessner and D. A. Golden, *Modern Food Microbiology,* Springer US, New York, 7th edition, 2006. (ISBN 978-0-387231808)

R. K. Dart, *Microbiology for the Analytical Chemist,* RSC Publishing, Cambridge, 1996. (ISBN 978-0-85404-524-2)

Quality Assurance in Analytical Chemistry: Training and Teaching, ed. B. W. Wenclawiak, M. Koch and E. Hadjicosta, Springer-Verlag Berlin and Heidelberg GmbH & Co KG, Heidelberg, 2010.

Wiley online resources:
https://www.spectroscopynow.com/
https://www.separationsnow.com/

5. Portfolio and Regular Submissions

5.1 Introduction and Regular Submissions

The portfolio of evidence forms a record of the candidates experience and should be visited and contributed to throughout the candidate's period of study. The portfolio will be formally assessed at two points, the first assessment will be prior to sitting the Part B exam and the final assessment will be carried out to ascertain if the candidate is ready to sit Part C exam.

Candidates will also be required to submit evidence along with their MChemA Registration Form as well as their Registration for Part A (if both are done at the same time, only one submission is required). This first submission would require evidence of the candidate and counsellors having regular meetings, for example minutes and/or notes from these meetings. It should also include evidence and/or plans for training being undertaken by the candidate. The required content of this submission is flexible, but the assessors are looking for evidence that the candidate is progressing with their MChemA studies and developing as a potential Public Analyst. Below is a list of potential sources of evidence, however, if the candidate and counsellor deem something to be sufficient in demonstrating the above requirement, then it can be submitted as evidence.

Evidence can include but is not limited to:

- study plans, diary showing planned activity
- training course certificates,
- related CPD activities,
- minutes of meetings
- proof of lecture attendance.

After passing the Part A Exam, candidates will be requested to submit regular evidence every six months to coincide with the January and August deadlines. If the evidence is not submitted in time to meet either deadline, it may not be reviewed until after the following deadline. These submissions should contain evidence that the candidate is progressing with their MChemA studies as well as including five certificates and five labels. The labels and certificates should include examples of complex issues. The assessors will review each submission and provide any feedback on any core issues or problems they observe. The assessors will be looking for the correct legislation, transcriptions, application, interpretation, and conclusion. They will also be looking for candidates to develop their own style. This would also demonstrate to the assessors how the candidate is improving over time.

The certificates and labels provided during these regular submissions will not be marked and will not contribute to the portfolio mark. The six-monthly submissions are not mandatory; however, it is strongly encouraged that candidates do submit.

Any evidence provided during these 6-monthly submissions can be re-submitted as part of their first or second portfolio submission.

If a candidate is submitting either of the portfolio submissions, a regular evidence submission is not required. If a candidate has registered for the Part C examination and has submitted their second submission, then no further regular submissions are required.

5.2 Portfolio Composition

The portfolio will comprise:

1. Practical skills: evidence that the candidate has the necessary experience to be considered an expert.
2. Evidence of investigative and problem-solving skills, for example, an account of the investigation of a problem, advice given, a case report etc
3. A list, with brief notes, of the Acts and Regulations in which the Public Analyst is mentioned as an Authorised Analyst. This is to ensure that candidates are aware that these activities may be part of their work in the future.
4. Certificates (reports): 20 different certificates across the core areas of food, agriculture and drinking water.
5. Label Assessments: 20 different full label assessments across the core areas of food, agriculture and drinking water demonstrating a variety of faults.

Section 1: Practical skills (20% of available marks)
Candidates are asked to provide evidence that they are competent in the following areas, taken from the Part A syllabus:

a) Classical wet chemistry, e.g. gravimetry, titrimetry, cryoscopy, refractometry
b) Spectroscopy, e.g. UV/vis, IR, NIR, FT-IR, fluorescence, Raman
c) Separation techniques, chromatography, e.g. SPE, SME, TLC, GC, HPLC, UHPLC, GC-MS, LC-MS
d) Atomic and mass spectrometry, e.g. Flame photometry, AAS, GFAAS, AES, OES, ICP-OES, ICP-MS
e) Molecular biology, e.g. microbiology, ELISA, DNA techniques (RT-PCR, NGS)
f) Other techniques, e.g. electrochemistry, radiochemistry, XRF, laser ablation

For this section, ‘evidence’ would commonly be training records for particular techniques that fall under each area. Example are given against areas a-f above.

Candidates should provide a total of 12 records of training, with at least one technique from each

of the six areas listed above.

Alongside each of the areas a-f, candidates should provide a reflective statement comprehensive enough to enable the assessors to understand their total experience of the technique, the different equipment they have used, and the methods, sample matrices and analytes they have used the technique for. This narrative should also cover the frequency with which they have used the technique, whether it is a technique they currently use regularly and identify any gaps in their skills etc.

The practical skills section should also include a written supporting statement from the internal counsellor that gives a fuller picture of the candidate's competency in each technique that they have included evidence of.

The practical skills section will be submitted at the first submission of the portfolio, prior to sitting Part B. At this stage, evidence of competence in eight techniques (with a minimum of one in each of the areas a-f) must be provided, however the full 12 pieces of evidence do not need to be submitted at this stage. If a candidate does not submit all 12 pieces of evidence, they must address this in their reflective statement and outline steps they will take to build competence between the first and second submissions.

At the second submission of the portfolio, 12 pieces of evidence will be expected (with at least one from each of the areas a-f) and the reflective statements should be updated where appropriate.

Section 2: Evidence of investigative and problem-solving skills (20% of available marks) 'Professional Skills'

The candidate should provide evidence from their recent work experience (within the last five years), with accompanying narrative that shows the assessors that they possess key professional skills or attributes, such as investigative and problem-solving skills, that would enable them to be competent in carrying out the more esoteric tasks that may be required from a Public Analyst.

In this section, candidates should provide evidence and reflection that:

1) Demonstrates how their knowledge of analytical chemistry informs their decisions and impacts on their work.
2) Demonstrates how they investigate and solve problems and draw conclusions by interpreting data, using evidence-based judgement and critical thinking to develop courses of action.
3) Demonstrates how they actively share knowledge with others
4) Demonstrates how they effectively convey information using both verbal and written forms.
5) Demonstrates how they continue to develop their knowledge of analytical chemistry and legislation relevant to the work of a Public Analyst and how this impacts on their work.

Examples of the typical types of evidence that could be submitted include:

- an investigation of PT scheme failure report
- a method validation report
- a food complaint investigation report
- an investigation for a customer
- a record that shows a candidate has developed and / or delivered training to colleagues or customers
- evidence of training attended

The list above is not exhaustive.

Each piece of evidence should be accompanied by a narrative of how the problem was approached and solved and what the learning outcomes were for the candidate. There should be sufficient detail given in this narrative to demonstrate to the assessors the particular skill or attribute.

This section does not need to be submitted in full until the final submission.

Section 3: Acts and Regulations (5% of available marks)

Candidates should provide a list, with brief notes, of the Acts and Regulations in which the Public Analyst is mentioned as an Authorised Analyst. This is to ensure that candidates are aware of the types of activities that may be part of their work in the future.

The complete list would be submitted with the first submission of the portfolio.

Section 4: Certificate writing (25% of available marks)

Candidates should provide a total of 20 different certificates that they have written, which cover the core areas of chemical and microbiological aspects of food, agriculture, and potable water. Certificates provided should aim to cover varying degrees of complexity and not all just straightforward fails, e.g., where uncertainty of measurement has to be considered, where there are no legislative standards, and an opinion has to be given. The candidate should demonstrate that they can deal with "grey" areas and not just black and white. The candidate should also include some complaint reports.

Alongside each certificate there should be an accompanying reflective statement, which should aim to help the assessors understand the candidate’s approach to writing each certificate and any additional evaluation of their competence that the candidate wishes to provide. This should not be a paraphrasing of the content of the certificate but should give an insight into the candidate’s thought process.

Section 5: Label Assessments (25% of available marks)

Candidates should provide full assessments of a total of 20 different labels demonstrating a variety of faults.

Alongside each label there should be an accompanying reflective statement, which should aim to help the assessors understand the candidate's approach to each label and any additional evaluation of their competence that the candidate wishes to provide.

5.3 Submission of Portfolio (5% of available marks)

The portfolio should be clearly presented and easy to navigate for the assessors. Evidence should, where appropriate, be presented in chronological order. Each submission of the portfolio should be accompanied by an executive summary, giving an overview of the contents and a 'position statement' that gives assessors an understanding of the candidate's level of skill and competency and any development areas that they have identified at the time of writing. Marks will be allocated for the standard of presentation of the portfolio, including the quality of the executive summary.

Candidates should submit their portfolio electronically to the RSC. Please contact the RSC in advance of the submission deadline regarding submission method (email or file-sharing). Candidates should ensure the files are organised logically for ease of assessment. A signed hard copy of the declaration form attesting that the files are a true and accurate representation of the candidates experience and are their own work should also be included.

The first submission of portfolio (prior to sitting part B) would contain the following sections, either partially or fully complete, as outlined below:

1. Executive summary: overview of the contents of the portfolio and a 'position statement' that gives the assessors an understanding of the candidate's level of skill and competency and any development areas that they have identified at the time of writing.
2. Practical skills: submission of this section could be either PARTIAL, with evidence of competence against at least eight techniques plus accompanying statements, with at least one piece of evidence in each of the areas a-f or FULL, with evidence and statements against 12 techniques, with at least one from each area a-f. A supporting statement from the counsellor should accompany either a partial or a full submission. In the case of a partial submission, in the accompanying statement, the candidate should outline steps they propose in order to gather further evidence for the second submission.
3. Evidence of investigative and problem-solving skills (professional skills): submission of this section could be either PARTIAL, with a minimum of eight pieces of evidence and supporting narrative against the professional skills being submitted, or FULL, with 12 pieces of evidence and supporting narrative being submitted.
4. Acts and Regulations: FULL
5. Certificate writing: PARTIAL, with 10 certificates and accompanying statements.
6. Label Assessments: PARTIAL, with 10 label assessments and accompanying statements.

Second submission, prior to sitting part C would contain the following components:

1. Executive summary: overview of the contents of the portfolio and a 'position statement' that gives the assessors an understanding of the candidate's level of skill and competency and any development areas that they have identified at the time of writing.
2. Practical skills: submission of this section should be FULL, with evidence and statements against 12 techniques, with at least one from each area a-f. A supporting statement from the counsellor should accompany the full submission.
3. Evidence of investigative and problem-solving skills (professional skills): submission of this section should be FULL, with 12 pieces of evidence and supporting narrative being submitted.
4. Acts and Regulations**:** FULL
5. Certificate writing: FULL, with the first 10 certificates and accompanying statements (updated if appropriate) from the initial submission prior to part B, plus a further 10 certificates and accompanying statements.
6. Label Assessments: FULL, with the first 10 label assessments and accompanying statements (updated if appropriate) from the initial submission prior to part B, plus a further 10 label assessments and accompanying statements.

5.4 Interview (0% of available marks)

Following submission of their portfolio, candidates will be invited to discuss their portfolios. This will be conducted remotely and held at a convenient time for the candidates and assessors (for timescales see section 6.2). Its purpose is to either, in the case of a very good portfolio, reassure and build the confidence of the candidate prior to their second submission and registration for Part C, or, in the case of the portfolio not being to a high standard, to satisfy the assessors that the candidate does possess the required competencies, and to give the candidate feedback that will enable them to improve their portfolio before the final submission. The length of time allowed for the discussion will be flexible to suit the purpose of the interview.

5.5 Portfolio Guidance

The portfolio is an integral part of the examination, and if it is unsatisfactory candidates will not be allowed to proceed to the practical examination.

Candidates and their internal counsellor must sign the portfolio of evidence to certify that it is the candidates own work. The counsellor is expected to:

- verify that the record of practical experience and ability in terms of methods, techniques, dates, depth, etc is accurate and true,
- verify that the candidate is competent in handling, investigating and analysing food (and possibly feed) complaints,

- ensure that the candidate has submitted reports covering all of the mandatory areas, namely food, agriculture and waters (bottled, private, public and bathing) to include microbiology and complaints,
- ensure that the candidate has submitted reports on optional subject matter pertinent to the Public Analyst field such as consumer and environment matters. This may also mean having to contact another Public Analyst laboratory for test results to interpret if the laboratory in which the candidates works in does not perform this type of analysis,
- acknowledge that the labels and corresponding certificates/test reports have been interpreted and produced respectively by the candidate, and
- ensure that the candidate's certificates/test reports are all up to a satisfactory standard for them to be submitted and assessed by the assessors with regards to factually correct limits, current regulations (including years), interpretations, comments, etc.

It is accepted that counsellors will participate in advising candidates on labels and certificates as part of the candidates training, but ultimately the material presented in the portfolio must be the candidates own work.

The 2nd portfolio of evidence submission will be assessed and deemed to be satisfactory or unsatisfactory by the assessors.

- If it is deemed to be satisfactory, candidates will be eligible to proceed to the one-day Part C practical examination.
- If the portfolio is deficient in many areas, candidates may be required to re-submit it in the following year. Candidates will only be able to sit the one-day Part C practical examination when the portfolio of evidence is deemed satisfactory.

5.6 Marking of the Portfolio

The first portfolio submission will not be provided with an official mark. The assessors will review it to the same level as the second submission but will only provide candidates with feedback and guidance on how to proceed. This will be discussed during the interview and written feedback will be provided afterwards.

Anything provided in the first submission can be re-submitted as part of the second submission which will be reviewed, and an official mark provided.

Total possible marks 1000

Marks	
800 - 1000	Accepted
<800	Reject

If a candidate receives less than 800 marks, they will not be allowed to progress on to the Part C exam and will need to re-submit their second submission the following year. Feedback and guidance will be provided.

The following is intended to guide the candidates as to the weighting of each part of the portfolio and to assist the assessors in the assessment of the portfolios of evidence.

Section 1: Practical skills, a possible total of 200 marks across all 12 submissions.

Section 2: Profession skills, a possible total of 200 marks across all 12 submissions.

Section 3: Acts and Regulations, a possible total of 50 marks

Section 4: Certificate writing, a possible total of 250 marks across all 20 certificates. Marks will be awarded appropriately with complexity.

The assessment of each certificate will consider whether:

i) the correct legislation and guidance has been taken into account
ii) all non-compliances have been identified
iii) the style and construction of the certificate generated

The portfolio must contain certificates which vary from simple to complex.

Section 5: Label Assessments a possible total of 250 marks across all 20 labels. Marks will be awarded appropriately with complexity.

The assessment of each label will consider whether:

i) the correct legislation has been taken into account
ii) any additional guidance applied
iii) all the correct errors identified with an explanation
iv) additional recommendations made outside the scope of legislation

The portfolio must contain reports on labels which vary from simple to complex (see section 5.1).

Submission: a possible total of 50 marks

6. Part B

6.1 Registration for Part B

To apply for the Part B examination, candidates must have successfully completed the Part A examination.

Candidates should submit their Part B application form along with their first portfolio submissions (details in section 5.3) to the MChemA Officer, who will then provide instructions on how to pay the application fee. The Part B counsellors' form (internal and external) should be completed and signed by the respective counsellors and submitted directly to the MChemA Officer.

6.2 Part B Timescale

The Part B application form must be received by the January deadline along with their first portfolio submission.

The application form will be reviewed by the Examination Board at their Spring meeting. If accepted, the candidate will be informed that they can sit the exam.

The portfolio will be review by the assessors and the results of both the first portfolio submission and Part B examination will be provided to the candidate within 8 weeks of them sitting the exam.

The candidate will then be invited to an interview which will be organised for late Summer/ early Autumn that year.

6.3 Part B Examination

The Part B exam consists of two four-hour theory examination papers split over two days. The two papers cover the essential core knowledge for this qualification in relation to food, water (for human consumption), and agriculture, including policy and law relating to food, potable water and agriculture.

Paper 1 will be on Food Standards and will include the following topics: Analysis with AQA (including ISO17205/ lab 33), Composition and Chemistry, Additives, Nutrition/Composition, Labelling as well as any related legislation. The paper will consist of six questions of which the candidate must select four to answer.

Paper 2 will be on Food Safety and Agriculture and will include the following food topics: Microbiology, Food manufacturing, Safety Aspects (including storage), Policy (aligned with topic type) as well as any related legislation. The paper will consist of four food/potable water questions in which the candidates must select three to answer. The paper will also include two agricultural questions of which one must be completed.

The pass mark for each paper is 50%. If a candidate achieves a mark of more than 50% in only one paper, they will be given an exemption from that paper for one year only. If they re-sit the Part B the following year, they will only sit the one paper they failed.

6.4 Part B Statement of Intent

On successful completion of the Part B examination candidates will be able to:

- Offer advice on sampling and analysis of food and agricultural materials
- Discuss and understand food, water and agriculture methodology and apply them appropriately
- Interpret relevant food, water and agricultural legislation
- Interpret results within the context of relevant food and agricultural legislation
- Understand and apply uncertainty of measurement and have a working knowledge of the principles of statistical assessment of data.

6.5 Syllabus for Part B

There is no recommended booklist for Part B, and candidates are advised to refer to Food Standards Agency Food and Law guide (https://www.food.gov.uk/business-guidance/general-food-law) the Food Standards Scotland's Food and Feed Guide (https://www.foodstandards.gov.scot/business-and-industry/safety-and-regulation/food-and-feed-law) and Association of Public Analysts website (http://www.publicanalyst.com/links/) for an understanding of what they are expected to know. There are also Training Guides prepared by the APA Training Committee and available on the APA website. There is also a Record of Study and Progress on this website which candidates and their counsellors may use so that candidates can ensure that they are sufficiently prepared for the examination, and which is a reference document for counsellors to complete the Part B Counsellors' Form. Candidates are also recommended to visit one or more food production premises or food factories.

The topics of the Part B examination are listed below for guidance, however, please review the legislation (see the links within this section) for a complete list.

Food

- Analysis with analytical quality assurance (including sampling, statistics and measurement reliability/uncertainty)
- Composition and chemistry
- Microbiology and microbiological examination
- Nutrition
- Food manufacturing practice, including storage and spoilage
- Safety aspects of food, including the effects of contaminants on human physiology
- Policy and law relating to food

Water for Human Consumption (included as part of the food questions in paper 1 and 2)

- Analysis and microbiological examination
- Potable water including principles of water treatment and distribution
- Policy and law relating to potable water including bottled water

Agriculture

- Analysis of fertilisers and feeding stuffs
- Analysis of residues, including pesticides, in food and water
- Policy and law relating to agriculture
- Animal and plant nutrition

6.6 Guidance Notes for Part B

Before applying for Part B, the candidates and their counsellors should consider the following:

- the level of the candidate's basic knowledge of physical, inorganic and organic chemistry as they apply to food, water and agriculture,
- whether the candidate has a high/low degree of skill in applying the theory of analytical

chemistry to the practical examination of foods, agriculture, water, and
- whether the candidate has the general experience and maturity required for the examination.

The Part B is a partially open book examination. Candidates will be allowed access to legislation only. They will not be allowed to communicate with third parties during the examination or freely search online for information. Candidates will need to bring their own electronic devices (laptops, tablets etc) in order to access the legislation during the examination. They can use any resources on the following two websites only, for the UK (Legislation.gov.uk) and EU (https://eur-lex.europa.eu/homepage.html?locale=en) legislation. Candidates will be required at the end of the examination to show their internet history covering the duration of the examination.

Candidates may also bring paper copies of the legislation with them to the examination. These must be original versions from online containing no handwriting and will be checked by the invigilators before the examination.

The questions asked will be in various formats and depending on the question, candidates will be required to not only state the facts in their answer but may also be required to provide a discussion and rationale for their answer. Candidates should ensure that, when asked by a question, they provide their own opinions and discussions. Candidates should also ensure they read the questions carefully as there will usually be key words such as describe, discuss, explain which give guidance on what the assessors expect from the answers.

To support their answers candidates will be required to reference the appropriate resources used for each question. Candidates should, were possible, use the RSC referencing format located: https://edu.rsc.org/resources/how-to-reference-using-the-rsc-style/1664.article.

There will be a mixture of questions styles but generally they will contain the following series of sub-questions:

- Those with readily available answers but will only be worth a few marks.
- Those which require candidates to have an understanding of practical experience.
- Those which require a comprehensive view of the topic including their own opinion which will carry the bulk of the marks.

Further information regarding questions that require the candidate to explain their rationale and provide their opinion can be found at the following sites:

- https://www.nebosh.org.uk/digital-assessments/certificate/what-is-an-open-book-examination/
- https://ar.cetl.hku.hk/am_obe.htm

7. Part C

7.2 Regulations for Part C

Candidates must be registered for the MChemA and have successfully completed Part B. They will typically have achieved MRSC or FRSC by the date of registration for the Part C examination.

Part C comprises the assessment of the second portfolio submission, followed by a one-day examination of interactive and practical exercises. This portfolio of evidence will be assessed formally before the Part C with assessors' comments being supplied by the end of May. If the portfolio is deficient in many areas, candidates will be required to resubmit their portfolio in its entirety the following January.

7.3 Timescales

The Part C application form must be received by the January deadline (the last Friday of the month). The candidate must also provide their second portfolio submission.

The application form will be reviewed by the Exams Board at their Spring meeting. The portfolio will be reviewed by the assessors and the result will be provided to the candidate by the end of May that year. If accepted, the candidate will be informed that they can sit the exam in September.

The candidate will then sit the Part C examination in September and the results will be provided to candidates within one week of the exam.

7.4 Part C Statement of Intent

On successful completion of the Part C examination candidates will be able to:

- Act as a competent Public Analyst, Agricultural Analyst and/or Food Examiner
- Be in a position to advice and guide on the process and analysis of enforcement samples when they are received into the laboratory.
- Problem solve in relation to food, potable water and agriculture complaint scenarios either when such samples are submitted the laboratory or when advice is requested.
- Attend incident management teams.
- Convey complex scientific and legal information both orally and in writing.
- Critically assess and report on food and agriculture labels and give advice with regard to such.

7.5 Syllabus for Part C

Part C provides the opportunity for the candidate to demonstrate their abilities in the application of the core knowledge. It also provides an opportunity for them to demonstrate their analytical practical experience in relation to eg consumer products, toxicology, research and development, waters and the environment.

The scope of the Part C examination will include the syllabus for Part B (section 6.5).

7.6 The Practical Examination

The one-day Part C practical examination will be undertaken at a suitable laboratory. The examination comprises eight compulsory questions:

a) Communication in the form of formal certificates
b) Microscopy (certificates will not be assessed during this exercise)
c) Communication and problem solving

The Part C is an open book examination. Candidates will be allowed access to any resources they feel are appropriate (including the internet), however they will not be allowed to communicate with third parties during the examination. During the examination the candidate's awareness and understanding of matters related to the work of a Public Analyst will be explored, including analytical quality assurance, precision and error, sampling, and aspects of the environment pertinent to food safety and quality. The assessors will conduct a short viva during the course of the examination to gain an insight into the candidate's approach to the problems. The overall pass mark for the practical part of the Part C examination is 50%. Candidates must also achieve the following minimum percentage marks in each section of the examination:

Communication in the form of formal certificates	50%
Microscopy	40%
Communication and problem solving	40%

If the minimum mark is not achieved in all sections, candidates must resit the whole examination and pay the Part C fee. If the subsequent attempt at Part C is more than one year after the first occasion, a portfolio of evidence must also be updated to demonstrate that the standard of the portfolio has been maintained. In any case, candidates should provide an account of any new legislation since their first submission.

7.7 Guidance Notes for the Practical Examination

The practical examination will be held in a suitable laboratory; however, the location is not fixed and will be decided each year after receiving all the applications for that year's exam. A suitable location will be decided depending on the "home" location of all candidates and assessors involved.

The assessors aim to make the examination as realistic as possible and to have conditions similar to those in a well-equipped Public Analyst's Laboratory. It is the aim of the assessors to test the candidate's ability to act in the capacity as a Public Analyst.

The examination venue will be available on the afternoon prior to the examination for candidates to familiarise themselves with the surroundings and set up any personal equipment and books.

The RSC and assessors will attempt to provide all items on the Part C booklist however, this will be dependent on that year's location. Standard disposable items of equipment (eg pipettes, microscope slides) will be available. Any stains, reagents and reference materials which candidates may need will be provided. Details of what will be provided shall be communicated to candidates before the examination and they will be allowed to bring any other reference literature they require. Candidates will need to bring a laboratory coat and any other item they deem

necessary, for example, a spatula, felt tip pen, dissecting kit, calculator, practical and other reference texts, statistical tables. Candidates may wish to bring their microscopes, but these can be provided if required. The assessors reserve the right to indicate that certain items are not to be used or consulted during certain sections of the examination and may exclude any particular item absolutely.

Candidates should bring their own laptops with them to ensure they are able to gain access to the internet during the day as well as being able to access their stored files. Any reasonable use of the internet is permitted but it should be to enhance the candidate's knowledge, not to substitute for it. The assessors will provide guidance. They are looking for a systematic approach to decision-making and throughout the day, candidates should record their thought processes and reasoning in the answer book as well as the final answers. The assessors need to know how they derived an answer, and if they got part way, they would give credit for this.

(a) Communication in the form of formal certificates (three questions)

For each question, candidates will be provided with information from which they should prepare a formal certificate. Candidates should select the appropriate form from the blank certificates provided. They should accompany their certificate with notes to explain their reasoning.

(b) Microscopy (three questions)

Candidates may be given information concerning the background or origin of the specimen. In addition to the laboratory microscope at between 50X and 500X magnification, they are expected to use observations with the naked eye and the stereo or dissecting microscopes to assist in identification. Other elementary tests can also be useful. They should make diagrams and drawings and provide brief notes and a summary, including their identification and their reasons for the identification for each specimen. They should leave their slides on the bench at the end of the examination for the assessors to inspect. They do not need to produce formal certificates for this section.

(c) Communication and problem solving (two questions)

A series of samples, specimens or situations will be presented in a manner to simulate normal laboratory circumstances. Samples will be relevant to issues or problems encountered by a Public Analyst, Food Analyst or other professional analytical scientist. Candidates will have to determine the information required, acquire and manage that information then report accordingly. The assessors will explain the requirements at the beginning of the exam, and they may volunteer additional information in stages throughout the day. They will not need to undertake their own experimentation, other than basic procedures such as observations of appearance and odour and microscopy as necessary but will direct the assessors in a manner similar to the way a laboratory or section head would direct their staff. The assessors will act as enforcement officers, sampling officers and laboratory technicians and/or assessors, as required. Candidates can request any other information if needed. They should present their answer in the form of a report or official certificate of analysis or examination, as required by the question. In addition, they should present records of experimentation and document their reasoning for making the requests and coming to their own conclusions. They should include

their laboratory methods and may include published or unpublished methods from any source including their own laboratory. The assessors will carry out a short interview with the candidates during the afternoon, to enable them to understand their thought processes and approach to the investigation.

7.8 Expectations of the Assessors

The Part C practical examination tests not only a candidate's analytical skills but also their ability to tackle problems methodically and to test their investigative skills. A high standard of presentation of practical work and preparation of certificates is essential. Their counsellors should insist that all investigative work is properly recorded.

Candidates will be expected to demonstrate that they possess the qualities and attributes necessary to practice as a Public Analyst or Food Analyst. The assessors expect candidates to have a wide knowledge base and are looking for:

- a highly responsible attitude,
- an ability to respond to various situations in which analytical chemistry plays a significant role, and
- the capability to carry out analytical investigations.

Candidates should apply for the Part C examination when they and their counsellors are confident that they have achieved the following:

- a sound basic knowledge of the analytical chemistry of foods, agricultural materials and water,
- expertise in report and certificate writing,
- practical expertise in the use of the microscope for the quantitative and qualitative,
- a working knowledge of the basic principles of the following, in relation to the examination of foods and water, bacteriology, entomology and mycology,
- competence in investigation and problem-solving,
- the general experience and maturity required for the examination, and
- have produced a portfolio of evidence with relevant information of the required standard for Part C.

7.9 Booklist for Part C

Questions may be set on any subject in the syllabus for Part C. Candidates may bring any books and texts to the practical examination. The RSC and assessors will attempt to provide as many of the following texts as possible, however, this will depend on the location of that year's examination: (new editions may supersede those listed here, and the editions provided for the Part C practical exam will be those available from host laboratory).

ADAS (1986) *Handbook RB427 The Analysis of Agricultural Materials.*

AOAC *Official Methods of Analysis* 12th, 14th, 16th, 18th editions.

Busvine *Insects and Hygiene* 3rd edition

Butterworths *Law of Food and Drugs* (Vols 1-7)

Chamot and Mason *Handbook of Chemical Microscopy* (Vol II)

Feigl (1989) *Spot tests in Inorganic Analysis* 7th English Edition

Greenish and Collin *Anatomical Atlas of Vegetable Powders*

Holden (ed) *Water Treatment and Examination*

HMSO *Analysis of Raw, Potable and Waste Waters*

Kent-Jones and Amos *Modern Cereal Chemistry*

King *Developments in Food Analysis Techniques* (Vol 1-3)

Kirk and Sawyer (1991) *Composition and Analysis of Food* 9th edition (Pearson)

McCrone and Delly *(*1973) *The Particle Atlas*, Vol II

Merck Index (2006)14th edition

Parry *Spices - Their Morphology, Histology and Chemistry*

Pearson (1981, revised 1987) *Chemical Analysis of Foods* 8th edition

Pearson *Laboratory Techniques in Food Analysis*

Royal Society of Chemistry (1994) *Official, Standardised and Recommended Methods of Analysis*, 3rd Edition

Smith (1981) *Industrial Mycology* 7th edition,

Vaughan (1979) *Food Microscopy*

Vaughan *The Structure and Utilisation of Oil Seeds*

Vogel (2000) *Textbook of Quantitative Chemical Analysis* 6th edition

Wallis *Textbook of Pharmacognosy* 5th edition

Winton and Winton *Structure and Composition of Foods* (Vols 1-4)

Food Chemicals Codex (2008) 6th edition

8. General Guidance Notes for Counsellors (internal or external)

8.1 Introduction

The role of the counsellor during the candidate's training and subsequent application for each part of the MChemA exam is an important element of the process. Counselling should only be undertaken after careful consideration of the role and responsibilities involved. The expectation is that counsellors will act as a mentor and have regular interaction with the candidate. Candidates are required to nominate two counsellors (internal and external). The internal counsellor should normally be a senior member of their own laboratory. The external counsellor must hold the MChemA and work in a separate laboratory.

It is recommended that counsellors and candidates should meet at least once every three months, however, each candidate is different and therefore a higher frequency of meetings may be required. It is the responsibility of the candidate to communicate, arrange meetings and seek guidance from their counsellors when required. It is expected that counsellors will make themselves available to the candidates were reasonably possible. If a candidate does not work in a Public Analyst lab, it is expected that the external counsellor will provide greater input than expected for a candidate within a Public Analyst lab. Counsellors should be able to advise candidates when they are ready to take the examinations for each part of the MChemA.

Throughout the training period, the counsellors are asked to bear in mind the requirements of the MChemA examination and the future responsibilities candidates will be required to discharge as a Public Analyst. They should encourage the candidate to adopt a questioning and constructively critical attitude to every facet of the day-to-day work of a Public Analyst's laboratory. Candidates will need to become familiar with and, where possible, involved in decision-making processes. This may involve the operation of the laboratory, review of techniques, equipment purchases and commissioning, choice of staff, balancing the budget or any other aspect. In addition, opportunities should be afforded for the candidate to demonstrate initiative and develop potential for leadership. If a candidate works in industry, they will need to use their external counsellor for experience.

Candidates should be encouraged to pursue their studies within a structured framework, including attendance at any appropriate courses. They should be familiar with recent advances in the subjects, and the major textbooks and journals should be made available to them. If possible, counsellors should support applications for appropriate paid study leave with expenses.

Counsellors have responsibilities not only to the candidate, but also to the assessors who assess the candidate for suitability. If counsellors require any further advice on fulfilling the role of the counsellor, they should contact the MChemA Officer. Counsellors can also request guidance/ advice from other counsellors at the Counsellors meeting (section 2.7.2)

8.2 Requirements for the Counsellor

The counsellor has a duty to:

- the candidate;
- the candidate's employer;
- the RSC; and
- the general public.

Before agreeing to act, a counsellor should have formed an impression of the candidate's ability to make difficult ("grey area") decisions and to withstand the pressures that are inevitably associated with the professional duties and responsibilities of a Public Analyst.

Counsellors should emphasise the importance of practical training and are encouraged to help draw up a programme of practical work for the candidate.

They should, wherever possible, help the candidate to relate their theoretical knowledge to the

day-to-day issues involved in a Public Analyst's lab. Integration of the subject matter is important in providing the candidate with a comprehensive body of knowledge.

They are urged to ensure that the candidate is fully aware of the basic duties and responsibilities of the Public Analyst and to provide information on the nature and extent of compliance with the syllabus.

They should act primarily as a **guide** or **mentor** who can assist the aspiring Public Analyst by:

- providing guidance and direction on the course of study and acquisition of experience. This should happen well in advance of the candidate submitting their application,
- assisting in the preparation of a programme of practical experience,
- meeting regularly with the candidate to monitor and review progress, offer advice and answer questions,
- encouraging good record keeping against an agreed programme of training covering both knowledge requirements and practical experience requirements, and
- arranging introductions to key personnel in and outside the lab who can help in the candidates training.
- make sure all their submitted work is their own and to a good standard.

They should ensure, where it is reasonably practicable/ appropriate, that the candidate is made aware of any other day-to-day decisions which also take place in Public Analyst laboratory such as quality assurance, equipment purchase and servicing/troubleshooting, budget balancing.

8.3 Regular Evidence

For details regarding the requirements of the regular evidence submission please refer to section 5.1. At various stages, the counsellors will be required to provide comments on the candidate's registration forms and confirmation of evidence provided. The requirements for submitted evidence vary but it can overlap with regular CPD activities. These regular submissions are there to help assessors understand the candidate and their progression and therefore this can be whatever candidates and counsellors feel is an appropriate representation of this. This can include evidence used for other awards such as Charterships. An honest opinion of the candidate where an opinion is required will help the Examination Board assess a candidate's suitability to go to the exam and is therefore strongly encouraged.

8.4 Part A

Counsellors should assist the candidate in planning their studies, including assessment of the depth of their examination technique through coordinated regular communications and meetings. Practice with specimen questions and advice may be required and, in some cases, essential.

They should ensure that the candidate's knowledge of analytical techniques (including methods) covered in this syllabus is developed and improved in terms of theory, practical use, limitations, and interpretation of any produced results (including, but not limited to, detection limits, interferences and challenging their robustness). The latter should be demonstrated in the context

of the responsibilities and expectations of them being a future Public Analyst. The candidate may require supplementing their learning through additional courses.

8.5 Part B

Counsellors should help develop the candidate's knowledge of physical, inorganic and organic chemistry and microbiology applicable to food, agriculture and waters.

They should help develop the candidate's ability, to a high degree of skill, in applying the theory of analytical chemistry to the practical examination of foods, agriculture and waters to comply with relevant legislation and guidance.

In conjunction with the candidate and their other counsellor, they should decide whether the candidate has the experience, ability and maturity to sit the examination.

8.6 Portfolio Submissions

It is accepted that counsellors will participate in advising candidates on their labels and certificates as part of their training, but ultimately the material presented in the portfolio must be their own work.

Candidates and their internal counsellor must sign the portfolio of evidence to certify that it is the candidate's own work. The signature on the Part B and C application forms when the candidate submits their portfolio should be to verify that:

- the candidate's portfolio of practical experience and ability in terms of methods, techniques, dates, depth, etc is accurate and true;
- the candidate is competent in handling, investigating and analysing food (and feed) complaints;
- the candidate has submitted reports covering all of the mandatory areas namely food, agriculture and drinking waters (bottled, private, public and bathing) to include microbiology and complaints;
- the candidate has submitted reports on optional subject matters pertinent to the Public Analyst field such as consumer and environment matters. This may also mean contact with another Public Analyst laboratory may be required for this (the RSC can provide assistance if this is required);
- the labels and corresponding test reports and certificates have been interpreted and produced by the candidate, with only minimal advice and guidance having been given; and
- most importantly, all the submitted certificates and test reports are up to a sufficient standard to be assessed by the assessors with regard to, but not limited to, factually correct limits, current Regulations (including years) and reasonable interpretations and comments.

8.7 Part C

Counsellors should ensure that the candidate has achieved the following to a level which will give them a realistic chance at the time of sitting the examination which will assess and demonstrate to the assessors that they have the qualities and attributes to practice as a Public Analyst or Food Examiner:

- A sound knowledge of the analytical chemistry and microbiology of foods, agricultural materials, and waters.
- The ability to interpret data in a robust yet dispassionate way to form firm and defendable conclusions.
- Sufficient practice and expertise in report and certificate writing.
- Sufficient practice and expertise in both the qualitative and quantitative use of a microscope.
- Sufficiently competent in investigation and problem-solving of complaints.
- Possession of general experience and maturity.
- Production of a Portfolio of Evidence containing sufficient relevant information of the required standard for Part C.

9. Award of the MChemA

When candidates have completed the Part C successfully, the award of the MChemA will be confirmed by the MChemA Examinations Board.

10. Continuing Professional Development

MChemA holders are expected to maintain a commitment to Continuing Professional Development (CPD).

Continuing Professional Development has been defined by the RSC as *"the responsibility of individuals for the systematic maintenance, improvement and broadening of knowledge and skills to ensure continuing competence as a professional throughout their career."*

RSC members who hold Chartered Scientist (CSci), and Chartered Chemist (CChem), are required to confirm maintenance of CPD and may be requested to return evidence of this to the RSC. They can find the RSC CPD requirements on the website at www.rsc.org/cpd and can also use the APA CPC scheme to demonstrate their continuing competence.

11. MChemA application documents

All MChemA application forms, along with all other supporting documents are available on the RSC website at http://rsc.li/mchema.

12. Contact for further information

MChemA Officer
Royal Society of Chemistry
Thomas Graham House
Science Park
Milton Road
Cambridge CB4 0WF

Tel: 01223 432690
Email: mchema@rsc.org
Website: http://rsc.li/mchema