2016 Study Guide
Subject CA1

Introduction

This Study Guide contains all the information that you will need before starting to study Subject CA1 for the 2016 exams. Please read this Study Guide carefully before reading the Course Notes, even if you have studied for some actuarial exams before.

When studying for the UK actuarial exams, you will need:

- a copy of the Formulae and Tables for Examinations of the Faculty of Actuaries and the Institute of Actuaries, 2nd Edition (2002) – these are often referred to as simply the “Yellow Tables”

- a “permitted” scientific calculator – you will find the list of permitted calculators on the profession’s website. Please check the list carefully, since it is reviewed each year.

These are both available from the Institute and Faculty of Actuaries’ eShop. Please visit www.actuaries.org.uk.

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# The Subject CA1 course structure

There are ten parts to the Subject CA1 course. The parts cover related topics and have broadly equal lengths. The parts are broken down into chapters.

The following table shows how the parts, the chapters and the syllabus items relate to each other. The end column shows how the chapters relate to the days of the regular tutorials. This table should help you plan your progress across the study session.

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2 **ActEd study support**

Successful students tend to undertake three main study activities:

1. *Learning* – initial study and understanding of subject material
2. *Revision* – learning subject material and preparing to tackle exam-style questions

Different approaches suit different people. For example, you may like to learn material gradually over the months running up to the exams or you may do your revision in a shorter period just before the exams. Also, these three activities will almost certainly overlap.

We offer a flexible range of products to suit you and let you control your own learning and exam preparation. The following table shows the products that we produce. Note that not all products are available for all subjects.

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<tr>
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<th>LEARNING &amp; REVISION</th>
<th>REVISION</th>
<th>REVISION &amp; REHEARSAL</th>
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<td>Online Classroom</td>
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The products and services available for Subject CA1 are described below.
“Learning” products

Course Notes

The Course Notes will help you develop the basic knowledge and understanding of principles needed to pass the exam. They incorporate the complete Core Reading and include full explanation of all the syllabus objectives, with worked examples and short questions to test your understanding.

Each chapter includes the relevant syllabus objectives, a chapter summary and, where appropriate, a page of important formulae or definitions.

“Learning & revision” products

Question and Answer Bank

The Question and Answer Bank provides a comprehensive bank of questions (including some past exam questions) with full solutions and comments.

The Question and Answer Bank is divided into ten parts, each including a range of short and long questions to test your understanding of the corresponding part of the Course Notes.

X Assignments

The ten Series X Assignments (X1 to X10) cover the material in Parts 1 to 10 respectively. Assignments X1 to X5 are 80-mark tests and should take you two and a half hours to complete. Assignments X6 to X10 are 100-mark tests and should take you three hours to complete. The actual Subject CA1 examination papers will each have a total of 100 marks.

Combined Materials Pack (CMP)

The Combined Materials Pack (CMP) comprises the Course Notes, the Question and Answer Bank and the Series X Assignments.

The CMP is available in eBook format for viewing on a range of electronic devices. eBooks can be ordered separately or as an addition to paper products. Visit www.ActEd.co.uk for full details about the eBooks that are available, compatibility with different devices, software requirements and printing restrictions.
**CMP Upgrade**

The purpose of the CMP Upgrade is to enable you to amend last year’s study material to make it suitable for study for this year. In most cases, it lists all significant changes to the Core Reading and ActEd material so that you can manually amend your notes. The upgrade includes replacement pages and additional pages where appropriate.

However, if a large proportion of the material has changed significantly, making it inappropriate to include *all* changes, the upgrade will only outline what has changed. In this case, we recommend that you purchase a replacement CMP (printed copy or eBook) or Course Notes at a significantly reduced price.

The CMP Upgrade can be downloaded free of charge from our website at [www.ActEd.co.uk](http://www.ActEd.co.uk). Alternatively, if the upgrade contains a large number of pages, you may prefer to purchase a hard copy from us at a minimal price to cover production and handling costs.

A separate upgrade for eBooks is not produced but a significant discount is available for retakers wishing to re-purchase the latest eBook.

**X Assignment Marking**

We are happy to mark your attempts at the X assignments. Marking is not included with the Assignments or the CMP and you need to order it separately. We recommend that you submit your script by email. Your script will be marked electronically and you will be able to download your marked script via a secure link on the internet.

Don’t underestimate the benefits of doing and submitting assignments:

- Question practice during this phase of your study gives an early focus on the end goal of answering exam-style questions.
- You’re incentivised to keep up with your study plan and get a regular, realistic assessment of progress.
- Objective, personalised feedback from a high quality marker will highlight areas on which to work and help with exam technique.

In a recent study, we found that students who attempt more than half the assignments have significantly higher pass rates.
**Series Marking**

Series Marking applies to a specified subject, session and student. If you purchase Series Marking, you will **not** be able to defer the marking to a future exam sitting or transfer it to a different subject or student.

We typically send out full solutions with the Series X Assignments. However, if you order Series Marking at the same time as you order the Series X Assignments, you can choose whether or not to receive a copy of the solutions in advance. If you choose not to receive them with the study material, you will be able to download the solutions via a secure link on the internet when your marked script is returned (or following the final deadline date if you do not submit a script).

If you are having your attempts at the assignments marked by ActEd, you should submit your scripts regularly throughout the session, in accordance with the schedule of recommended dates set out in information provided with the assignments. This will help you to pace your study throughout the session and leave an adequate amount of time for revision and question practice.

The recommended submission dates are realistic targets for the majority of students. Your scripts will be returned more quickly if you submit them well before the final deadline dates.

Any script submitted **after** the relevant final deadline date will not be marked. It is your responsibility to ensure that we receive scripts in good time.

**The Essential Five**

The Essential Five marking product contains five assignments, ranging from 80 to 100 marks, for you to attempt and submit for marking. Each assignment tests key topics in two parts of the course material, and may be a good intermediate option for you. The questions have been hand-picked from the standard X Assignments as the most useful ones to have marked, focusing on key developmental skills.
Marking Vouchers

Marking Vouchers give the holder the right to submit a script for marking at any time, irrespective of the individual assignment deadlines, study session, subject or person. Marking Vouchers can be used for any assignment. They are valid for four years from the date of purchase and can be refunded at any time up to the expiry date.

Although you may submit your script with a Marking Voucher at any time, you will need to adhere to the explicit Marking Voucher deadline dates to ensure that your script is returned before the date of the exam. The deadline dates are provided with the assignments.

Tutorials

Our tutorials are specifically designed to develop the knowledge that you will acquire from the course material into the higher-level understanding that is needed to pass the exam.

We run a range of different tutorials including face-to-face tutorials at various locations, and Live Online tutorials. Full details are set out in our Tuition Bulletin, which is available from our website at www.ActEd.co.uk.

Regular and Block Tutorials

In preparation for these tutorials, we expect you to have read the relevant part(s) of the Course Notes before attending the tutorial so that the group can spend time on exam questions and discussion to develop understanding rather than basic bookwork.

You can choose one of the following types of tutorial:

- **Regular Tutorials** (five full days) spread over the session.
- A **Block Tutorial** (five full days, usually split into a two-day part and a three-day part) held 2 to 8 weeks before the exam.
**Online Classroom**

The Online Classroom acts as either a valuable add-on or a great alternative to a face-to-face or Live Online tutorial.

At the heart of the Online Classroom in each subject is a comprehensive, easily-searched collection of over 100 tutorial units. These are a mix of:

- teaching units, helping you to really get to grips with the course material, and
- guided questions, enabling you to learn the most efficient ways to answer questions and avoid common exam pitfalls.

The best way to discover the Online Classroom is to see it in action. You can watch a sample of the Online Classroom tutorial units on our website at [www.ActEd.co.uk](http://www.ActEd.co.uk).

**“Revision” products**

For most subjects, there is a lot of material to revise. Finding a way to fit revision into your routine as painlessly as possible has got to be a good strategy! Flashcards, Sound Revision and MyTest are inexpensive options that can provide a massive boost. They can also provide a variation in activities during a study day, and so help you to maintain concentration and effectiveness.

**Flashcards**

Flashcards are a set of A6-sized cards that cover the key points of the subject that most students want to commit to memory. Each flashcard has questions on one side and the answers on the reverse. We recommend that you use the cards actively and test yourself as you go.

Flashcards are available in eBook format for viewing on a range of electronic devices. eBooks can be ordered separately or as an addition to paper products. Visit [www.ActEd.co.uk](http://www.ActEd.co.uk) for full details about the eBooks that are available, compatibility with different devices, software requirements and printing restrictions.

**Sound Revision**

It is reported that only 30% of information that is read is retained but this rises to 50% if the information is also heard.

Sound Revision is a set of audio files, designed to help you remember the most important aspects of the Core Reading.
The files cover the majority of the course, split into a number of manageable topics based on the chapters in the Course Notes. Each section lasts no longer than a few minutes so it’s perfect for the train, tube, or car journey on the way to work, or where taking folders and course notes is not practical.

**MyTest**

MyTest is a revision product containing over 850 questions specially written for actuarial students. There are some multiple-choice questions and some requiring a longer answer. The more you use it, the more it learns about the gaps in your knowledge and understanding. Questions become ever more focused onto these gaps, until they are filled. In a recent study, it was found that students who focus on questions testing the areas of the course they find most difficult have significantly higher pass rates.

MyTest is only available online. Registration runs for one exam session and will automatically expire after the exam. Visit our website at [www.ActEd.co.uk](http://www.ActEd.co.uk) for information on how the programme works and details of how to place an order for MyTest.

**Choice of revision product**

For most students, using one or two of these products will be more effective than using all three and different students will have preferences for different products.

So, what might influence your choice between these three study aids? The following questions and comments might help you to choose the revision products that are most suitable for you:

**Flashcards**

- Do you have a regular train or bus journey?
  
  *Flashcards are ideal for regular bursts of revision on the move.*

- Do you want to fit more study into your routine?
  
  *Flashcards are a good option for “dead time”, eg using flashcards on your phone or sticking them on the wall in your study.*

- Do you find yourself cramming for exams (even if that’s not your original plan!)?
  
  *Flashcards are an extremely efficient way to do your pre-exam memorising.*
Sound Revision

- Do you have some regular time where carrying other materials isn’t practical, eg commuting, at the gym, walking the dog?
  
  *Sound Revision is an ideal “hands-free” revision tool.*

- Do you have a preference for auditory learning, eg do you remember conversations more easily than emails?
  
  *Sound Revision will suit your preferred style and be especially effective for you.*

MyTest

- Do you tend to avoid studying topics you find difficult?
  
  *MyTest tracks your progress and tailors future tests to reflect this.*

- Do you want to fit in some study at work?
  
  *MyTest is ideal for regular bursts of revision at the start of the day or at lunchtime.*

- Do you like being at your computer?
  
  *If you’re not tired of looking at a screen after a day at work, then MyTest may be for you.*

Choosing more than one revision product

As there is some degree of overlap between revision products, we do not necessarily recommend using them all simultaneously. However, if you are retaking a subject, then you might consider using a different product than on a previous attempt to keep your revision fresh and effective.

“Revision & rehearsal” products

Revision Notes

Our Revision Notes have been designed with input from students to help you revise efficiently. They are suitable for first-time sitters who have worked through the ActEd Course Notes or for retakers (who should find them much more useful and challenging than simply reading through the course again).
The Revision Notes are a set of eleven A5 booklets – perfect for revising on the train or tube to work. Each booklet covers one main theme or a set of related topics from the course and includes:

- Core Reading with a set of integrated short questions to develop your bookwork knowledge
- relevant past exam questions with concise solutions from the last ten years
- detailed analysis of key past exam questions (selected for their difficulty), and
- other useful revision aids.

**ActEd Solutions with Exam Technique (ASET)**

The ActEd Solutions with Exam Technique (ASET) contains our solutions to the previous four years’ exam papers, ie sixteen papers, plus comment and explanation. In particular it will highlight how questions might have been analysed and interpreted so as to produce a good solution with a wide range of relevant points. This will be valuable in approaching questions in subsequent examinations.

From the September 2012 exam session onwards, we have also indicated a balanced solution that we believe would have scored fully in the exam. Alternative (equally valid) points are then covered in a section below this model solution. This should give a valuable insight into the breadth, depth and number of points required in an excellent answer.

A “Mini-ASET” will also be available in the summer session covering the April exam only.

**Revision Tutorials**

Revision Tutorials are intensive one-day face-to-face or Live Online tutorials in the final run-up to the exam.

They give you the opportunity to practise interpreting and answering past exam questions and to raise any outstanding queries with an ActEd tutor. These courses are most suitable if you have previously attended Regular Tutorials or a Block Tutorial in the same subject.

Details of how to apply for our tutorials are set out in our *Tuition Bulletin*, which is available from our website at [www.ActEd.co.uk](http://www.ActEd.co.uk).
“Rehearsal” products

Mock Exam A

Mock Exam A consists of two 100-mark exam papers and is a realistic test of your exam preparation. It is based on Mock Exam A from last year but it has been updated to reflect any changes to the Syllabus and Core Reading.

Additional Mock Pack (AMP)

The Additional Mock Pack (AMP) consists of two further mock exam papers (each consisting of two 100-mark papers) – Mock Exam B and Mock Exam C. This is ideal if you are retaking and have already sat Mock Exam A, or if you just want some extra question practice.

Mock / AMP Marking

We are happy to mark your attempts at Mock Exam A or the mock exams included within the AMP. The same general principles apply as for the X Assignment Marking. In particular:

- Mock Exam Marking is available for Mock Exam A and it applies to a specified subject, session and student
- Marking Vouchers can be used for Mock Exam A or the mock exams contained within the AMP; please note that attempts at the AMP can only be marked using Marking Vouchers.

Recall that:

- marking is not included with the products themselves and you need to order it separately
- we recommend that you submit your script by email
- your script will be marked electronically and you will be able to download your marked script via a secure link on the internet.

Queries and feedback

From time to time you may come across something in the study material that is unclear to you. The easiest way to solve such problems is often through discussion with friends, colleagues and peers – they will probably have had similar experiences whilst studying. If there’s no-one at work to talk to then use our discussion forum at www.ActEd.co.uk/forums (or use the link from our home page at www.ActEd.co.uk).
Our online forum is dedicated to actuarial students so that you can get help from fellow students on any aspect of your studies from technical issues to study advice. You could also use it to get ideas for revision or for further reading around the subject that you are studying. ActEd tutors will visit the site from time to time to ensure that you are not being led astray and we also post other frequently asked questions from students on the forum as they arise.

If you are still stuck, then you can send queries by email to CA1bpp.com (but we recommend that you try the forum first). We will endeavour to contact you as soon as possible after receiving your query but you should be aware that it may take some time to reply to queries, particularly when tutors are away from the office running tutorials. At the busiest teaching times of year, it may take us more than a week to get back to you.

If you have many queries on the course material, you should raise them at a tutorial or book a personal tuition session with an ActEd tutor. Information about personal tuition is set out in our current brochure. Please email ActEdbpp.com for more details.

If you find an error in the course, please check the corrections page of our website (www.ActEd.co.uk/Html/paper_corrections.htm) to see if the correction has already been dealt with. Otherwise please send details via email to CA1bpp.com or send a fax to 01235 550085.

Each year our tutors work hard to improve the quality of the study material and to ensure that the courses are as clear as possible and free from errors. We are always happy to receive feedback from students, particularly details concerning any errors, contradictions or unclear statements in the courses. If you have any comments on this course please email them to CA1bpp.com or fax them to 01235 550085.

Our tutors also work with the profession to suggest developments and improvements to the Syllabus and Core Reading. If you have any comments or concerns about the Syllabus or Core Reading, these can be passed on via ActEd. Alternatively, you can send them directly to the Institute and Faculty of Actuaries’ Examination Team by email to education.services@actuaries.org.uk.
3 How to study to pass the exams

The Subject CA1 exams

It is important to recognise that the Subject CA1 exam is very different from the CT Subject exams in both the nature of the material covered and the skills being examined.

Both the Core Reading and the exam papers themselves are generally much less numerical and more “wordy” than the typical CT subject. The exam will primarily require you to explain a particular point in words and sentences, rather than to manipulate formulae. Numerical questions typically account for a very small part of each exam paper. If you haven’t sat this type of exam for some time, you need to start practising again now. Many students find that it takes time to adjust to the different style of the Subject CA1 exam questions. As ever, practice is the key to success.

The aim of the two Subject CA1 exam papers is to test your ability to apply your knowledge and understanding of the key principles described in the Core Reading to specific situations presented to you in the form of exam questions. Therefore your aim should be to identify and understand the key principles, and then to practise applying them. You will also need a good knowledge of the Core Reading to score well and quickly on any bookwork questions.

Both exam papers will cover material from throughout the entire Subject CA1 course.

We recommend that you prepare for the exam by practising a large number of exam-style questions under exam conditions. This will:

- help you to develop the necessary knowledge and understanding of the key principles described in the Core Reading
- highlight exactly which are the key principles that crop up time and time again in many different contexts and questions
- help you to practise the specific skills that you will need to pass the exam.

There are many sources of exam-style questions. You can use past exam papers, the Question and Answer Bank (which includes many past exam questions), assignments, mock exams, the Revision Notes and ASET.
Overall study plan

We suggest that you develop a realistic study plan, building in time for relaxation and allowing some time for contingencies. Be aware of busy times at work, when you may not be able to take as much study leave as you would like. Once you have set your plan, be determined to stick to it. You don’t have to be too prescriptive at this stage about what precisely you do on each study day. The main thing is to be clear that you will cover all the important activities in an appropriate manner and leave plenty of time for revision and question practice.

Aim to manage your study so as to allow plenty of time for the concepts you meet in this course to “bed down” in your mind. Most successful students will probably aim to complete the course at least six weeks before the exam, thereby leaving a sufficient amount of time for revision. By finishing the course as quickly as possible, you will have a much clearer view of the big picture. It will also allow you to structure your revision so that you can concentrate on the important and difficult areas of the course.

A sample Subject CA1 study plan is available on our website at:

www.ActEd.co.uk/Html/help_and_advice_study_plans.htm

It includes details of useful dates, including assignment deadlines and tutorial finalisation dates.

Also, you can try looking at our discussion forum on the internet, which can be accessed at www.ActEd.co.uk/forums (or use the link from our home page at www.ActEd.co.uk). There are some good suggestions from students on how to study.

Study sessions

Only do activities that will increase your chance of passing. Try to avoid including activities for the sake of it and don’t spend time reviewing material that you already understand. You will only improve your chances of passing the exam by getting on top of the material that you currently find difficult.

In particular, you may already be familiar with the content of some of the chapters (from the CT or ST subjects). Try to cover these chapters quickly to give yourself more time on the material with which you are less comfortable. Also, some chapters refer back to material from the CT subjects. You don’t have to follow these links up unless you are feeling curious or clueless.
Ideally, each study session should have a specific purpose and be based on a specific task, eg “Finish reading Chapter 3 and attempt Questions 1.4, 1.7 and 1.12 from the Question and Answer Bank”, as opposed to a specific amount of time, eg “Three hours studying the material in Chapter 3”.

Try to study somewhere quiet and free from distractions (eg a library or a desk at home dedicated to study). Find out when you operate at your peak, and endeavour to study at those times of the day. This might be between 8am and 10am or could be in the evening. Take short breaks during your study to remain focused – it’s definitely time for a short break if you find that your brain is tired and that your concentration has started to drift from the information in front of you.

**Order of study**

We suggest that you work through each of the chapters in turn. To get the maximum benefit from each chapter you should proceed in the following order:

1. Read the Syllabus Objectives. These are set out in the box on page 1 of each chapter.

2. Read the Chapter Summary at the end of each chapter. This will give you a useful overview of the material that you are about to study and help you to appreciate the context of the ideas that you meet.

3. Study the Course Notes in detail, annotating them and possibly making your own notes. Try the self-assessment questions and Core Reading example questions as you come to them. Our suggested solutions are at the end of each chapter. As you study, pay particular attention to the listing of the Syllabus Objectives and to the Core Reading.

4. Read the Chapter Summary again carefully. If there are any ideas that you can’t remember covering in the Course Notes, read the relevant section of the notes again to refresh your memory.

It’s a fact that people are more likely to remember something if they review it several times. So, do look over the chapters you have studied so far from time to time. It is useful to re-read the Chapter Summaries or to try the questions in the chapter again a few days after reading the chapter itself.

You may like to attempt some questions from the Question and Answer Bank when you have completed a part of the course. It’s a good idea to annotate the questions with details of when you attempted each one. This makes it easier to ensure that you try all of the questions as part of your revision without repeating any that you got right first time.
Once you’ve read the relevant part of the notes, tried a selection of questions from the Question and Answer Bank (and attended a tutorial, if appropriate), you should attempt the corresponding assignment. If you submit your assignment for marking, spend some time looking through it carefully when it is returned. It can seem a bit depressing to analyse the errors you made, but you will increase your chances of passing the exam by learning from your mistakes. The markers will try their best to provide practical comments to help you to improve.

To be really prepared for the exam, you should not only know and understand the Core Reading but also be aware of what the examiners will expect. Your revision programme should include plenty of question practice so that you are aware of the typical style, content and marking structure of exam questions.

As ActEd tutors, it is very illuminating to see/hear how different students study for the exams. We hear quite a few students make comments such as:

- Assignment questions are not relevant to the exam.
- It’s quicker just to read through the assignment questions and solutions.
- There isn’t enough time to get the assignments done.

Sound familiar?

It may be worth thinking again for Subject CA1 as, when we look at the pass lists, we are finding that there is a correlation between students who are making the effort to do assignment, mock exam and past exam questions, and those who are happy on exam results day.

**Active study**

Here are some techniques that may help you to study actively.

1. Don’t believe everything you read! Good students tend to question everything that they read. They will ask “why, how, what for, when?” when confronted with a new concept, and they will apply their own judgement. This contrasts with those who unquestioningly believe what they are told, learn it thoroughly, and reproduce it (unquestioningly?) in response to exam questions.

2. Another useful technique as you read the Course Notes is to think of possible questions that the examiners could ask. This will help you to understand the examiners’ point of view and should mean that there are fewer nasty surprises in the exam room! Use the Syllabus to help you make up questions.
3. Annotate your notes with your own ideas and questions. This will make you study more actively and will help when you come to review and revise the material. Do not simply copy out the notes without thinking about the issues.

4. As you study each chapter, condense the key points (not whole chunks of text) onto a double side of A4 or less. This is essential as otherwise, when you come to revision, you will end up having to re-read the whole course again, and there isn’t time!

5. Try and come up with mnemonics or other memory aids for remembering the material when you come back to it later.

6. Attempt the questions in the notes as you work through the course. Write down your answer before you refer to the solution.

7. Attempt other questions and assignments on a similar basis, ie write down your answer before looking at the solution provided. Attempting the assignments under exam conditions has some particular benefits:
   - It forces you to think and act in a way that is similar to how you will behave in the exam.
   - When you have your assignments marked it is much more useful if the marker’s comments can show you how to improve your performance under exam conditions than your performance when you have access to the notes and are under no time pressure.
   - The knowledge that you are going to do an assignment under exam conditions and then submit it (however good or bad) for marking can act as a powerful incentive to make you study each part as well as possible.
   - It is also quicker than trying to write perfect answers.

8. Sit a mock exam four to six weeks before the real exam to identify your weaknesses and work to improve them. You could use a mock exam written by ActEd or a past exam paper.
4 Frequently asked questions

Q: **What knowledge of earlier subjects should I have?**

A: The Course Notes are written on the assumption that students have studied Subjects CT1-CT8. However, the key areas that you need (e.g., a knowledge and understanding of the principal characteristics of the main asset classes and of the key macroeconomic variables and their inter-relationships) are revisited at the relevant points in this course.

Q: **For the 2009 exams the CA1 course was renamed and the syllabus substantially updated. Are the CA1 exam questions from 2005 to 2008 still relevant?**

A: Yes – most of the questions are still relevant. The exceptions are the ones on the topics no longer covered (e.g., September 2006 Paper 1 Question 2 on investment indices and September 2006 Paper 2 Question 1 on takeover rules). We’ve removed these questions from ActEd materials such as the Revision Notes. However, if you’re going back to the actual exam papers on www.actuaries.org.uk you will need to look out for them. (You should be able to spot them as topics you’ve not seen in the course.)

Q: **If I want to go back to exam questions earlier than 2005, which old era (300-series) questions are relevant to Subject CA1?**

A: Many of the old Subject 301, 302, 303, 304 and 305 questions are relevant and worth attempting. It should be reasonably clear when a question is no longer on the syllabus because (assuming you have read the course) you won’t recognise the topic being examined, e.g., fundamental analysis, performance appraisal, derivative strategies, OEICs, notional portfolios.

The ActEd CA1 tutors have compiled a cross-reference table indicating which old 300 Series exam questions we consider to be relevant to Subject CA1. This is available to download directly from the “CA1 Past Questions” thread on the ActEd Discussion Forum.

Q: **How long is the exam?**

A: There are two papers and you have three hours plus fifteen minutes’ reading time for each of them.

Q: **Are both the papers sat on the same day?**

A: No. The papers will be sat on different days.
Q: Are the two papers designated as testing different things?

A: No, there’s no distinction in what they can test. Both papers can test any aspect of the Subject CA1 course.

Q: What calculators am I allowed to use in the exam?

A: Please refer to www.actuaries.org.uk for the latest advice.
5 Core Reading and the Syllabus

The Syllabus for Subject CA1, and the Core Reading that supplements it, has been produced by the Institute and Faculty of Actuaries. The relevant individual Syllabus Objectives are included at the start of each course chapter and a complete copy of the Syllabus is included in Section 6 of this Study Guide. We recommend that you use the Syllabus as an important part of your study. The purpose of the Core Reading is to assist in ensuring that tutors, students and examiners have a clear, shared appreciation of the requirements of the Syllabus. The Core Reading supports coverage of the Syllabus in helping to ensure that both depth and breadth are re-enforced. It is therefore important that students have a good understanding of the concepts covered by the Core Reading.

Core Reading deals with each syllabus objective. Core Reading covers what is needed to pass the exam but the tuition material that has been written by ActEd enhances it by giving examples and further explanation of key points. The Subject CA1 Course Notes include the Core Reading in full, integrated throughout the course. Here is an excerpt from some ActEd Course Notes to show you how to identify Core Reading and the ActEd material. Core Reading is shown in this bold font.

Note that in the example given above, the index will fall if the actual share price goes below the theoretical ex-rights share price. Again, this is consistent with what would happen to an underlying portfolio.

After allowing for chain-linking, the formula for the investment index becomes:

\[ I(t) = \frac{\sum_{i=1}^{I} N_{i,t} P_{i,t}}{B(t)} \]

where \( N_{i,t} \) is the number of shares issued for the \( i \)th constituent at time \( t \); \( B(t) \) is the base value, or divisor, at time \( t \).
Core Reading accreditation

The Institute and Faculty of Actuaries would like to thank the numerous people who have helped in the development of this material and in the previous versions of Core Reading for aspects of subjects that now form part of this course. The following papers and books have been used as the basis for several Units:


Changes to the Syllabus and Core Reading

The Syllabus and Core Reading are updated as at 31 May each year. The exams in April and September / October 2016 will be based on the Syllabus and Core Reading as at 31 May 2015.

We recommend that you always use the up-to-date Core Reading to prepare for the exams.

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Legal action will be taken if these terms are infringed. In addition, we may seek to take disciplinary action through the Institute and Faculty of Actuaries or through your employer.

These conditions remain in force after you have finished using the course.
Past exam papers

You can download some past exam papers and Examiners’ Reports from the profession’s website at www.actuaries.org.uk.
6 Syllabus

The full Syllabus for Subject CA1 is given here. To the right of each objective are the chapter numbers in which the objective is covered in the ActEd course.

Aim

The aim of the Actuarial Risk Management subject is that upon successful completion, the candidate should understand strategic concepts in the management of the business activities of financial institutions and programmes, including the processes for management of the various types of risk faced, and be able to analyse the issues and formulate, justify and present plausible and appropriate solutions to business problems.

Links to other subjects

Each of Subjects CT1–CT8 provides principles and tools that are built upon in Actuarial Risk Management.

The Specialist Technical Subjects ST1–ST9 and the Specialist Applications Subjects SA1–SA6 use the principles developed in this subject to solve complex problems, to produce coherent advice and to make recommendations in specific practice areas.

Objectives

On the successful completion of this subject the candidate will be able to:

1 How to do a professional job (Chapters 0 and 1)

1.1 Describe how actuaries can contribute to meeting the business needs of their clients and other stakeholders.

1.2 Describe the statutory roles that may be required of actuaries in pensions and insurance, both in the public and private sectors.

1.3 Outline the professionalism framework of the Institute and Faculty of Actuaries and the Financial Reporting Council.

1.4 Describe the factors and issues to be taken into account when doing a professional job.

1.5 Describe the Actuarial Control Cycle and explain the purpose of each of its components.
1.6 Demonstrate how the Actuarial Control Cycle can be applied in a variety of practical commercial situations, including its use as a Risk Management Control Cycle.

2 Stakeholders and their needs  
(Chapters 2 and 5 to 8)

2.1 Identify the clients that actuaries advise in both the public and private sectors and the stakeholders affected by that advice.

2.2 Describe how stakeholders other than the client might be affected by any actuarial advice given.

2.3 Describe the functions of the clients and potential clients that actuaries advise and the types of advice that actuaries might give to their clients.

2.4 Explain why and how certain factual information about the client should be sought in order to be able to give advice.

2.5 Explain why subjective attitudes of clients and other stakeholders – especially towards risk – are relevant to giving advice.

2.6 Distinguish between the responsibility for giving advice and the responsibility for taking decisions.

2.7 Describe the main providers of benefits on contingent events.

2.8 Describe how products, schemes, contracts and other arrangements can provide benefits on contingent events which meet the needs of clients and stakeholders.

2.9 Describe the ways of analysing the needs of clients and stakeholders to determine the appropriate benefits on contingent events to be provided by financial and other products, schemes, contracts and other arrangements.

3 General environment

3.1 Risk environment  
(Chapters 39 to 44)

3.1.1 Describe the risk management process for a business that can aid in the design of products, schemes, contracts and other arrangements to provide benefits on contingent events.
3.1.2 Describe how risk classification can aid in the design of products, schemes, contracts and other arrangements that provide benefits on contingent events.

3.1.3 Discuss the difference between systematic and diversifiable risk.

3.1.4 Discuss risk appetite and the attainment of risk efficiency.

3.1.5 Describe credit risk and the use of credit ratings.

3.1.6 Describe liquidity risk.

3.1.7 Describe market risk.

3.1.8 Describe operational risk.

3.1.9 Describe business risk.

3.1.10 Describe attitudes to and methods of risk acceptance, rejection, transfer and management for stakeholders.

3.1.11 Discuss the portfolio approach to the overall management of risk, including the use of diversification and avoidance of risk concentrations.

3.1.12 Distinguish between the risks taken as an opportunity for profit and the risks to be mitigated.

3.1.13 Describe the principle of pooling risks.

3.1.14 Describe the methods of transferring risks.

3.1.15 Describe how enterprise risk management can add value to the management of a business.

3.1.16 Describe the risks and uncertainties affecting:
   - the level and incidence of benefits payable on contingent events
   - the overall security of benefits payable on contingent events.
3.2 Regulatory environment  

3.2.1 Describe the principles and aims of prudential and market conduct regulatory regimes.

3.2.2 Explain the concept of information asymmetry.

3.2.3 Explain how certain features of financial contracts might be identified as unfair.

3.2.4 Discuss the implications of a requirement to treat the customer fairly.

3.3 External environment  

Describe the implications for the main providers of benefits on contingent events of:

- legislation — regulations
- State benefits
- tax
- accounting standards
- capital adequacy and solvency
- corporate governance
- risk management requirements
- competitive advantage
- commercial requirements
- changing cultural and social trends
- demographic changes
- environmental issues
- lifestyle considerations
- international practice
- technological changes

3.4 Investment environment  

3.4.1 Discuss the cashflows of simple financial arrangements and the need to invest appropriately to provide for financial benefits on contingent events.
3.4.2 Demonstrate a knowledge and understanding of the characteristics of the principal investment assets and of the markets in such assets.  
(Chapters 13 to 19)

3.4.3 Explain the principal economic influences on investment markets.  
(Chapter 20)

3.4.4 Describe the main features of the behaviour of market price levels and total returns and discuss their relationships to each other.  
(Chapter 21)

3.4.5 Discuss the theoretical and historical relationships between the total returns and the components of total returns, on equities, bonds and cash, and price and earnings inflation.  
(Chapter 22)

3.5 Capital requirements  
(Chapters 46 and 47)

3.5.1 Discuss why the main providers of benefits on contingent events need capital.

3.5.2 Describe how the main providers of benefits on contingent events can meet, manage and match their capital requirements.

3.5.3 Discuss the implications of the regulatory environment in which the business is written for provisioning and capital requirements.

3.5.4 Discuss different measures of capital needs.

3.5.5 Discuss the relative merits of looking at an economic balance sheet in order to consider the capital requirements of a provider of benefits on contingent events.

3.5.6 Discuss the use of internal models for assessment of economic and regulatory capital requirements.
4 Specifying the problem

4.1 Contract design (Chapters 6, 10 and 34)

4.1.1 Discuss the factors to be considered in determining a suitable design for financial structures eg products, schemes, contracts or other arrangements that will provide benefits on contingent events in relation to:

- the characteristics of the parties involved
- the risk appetite or risk aversion of the parties involved
- the level and form of benefits to be provided
- any options or guarantees that may be included
- the benefits payable on discontinuance or transfer of rights.
- the method of financing the benefits to be provided
- the choice of assets when benefits are funded
- the charges that will be levied
- the capital requirements.

4.1.2 Describe how the design of products, schemes, contracts and other arrangements can be used to help develop corporate human resource strategy.

4.2 Project planning and management (Chapters 11 and 12)

4.2.1 Describe the process of project management.

4.2.2 Show how actuarial techniques can be used in the assessment of capital investment projects and cost-benefit analyses.

4.2.3 Discuss how the risks of the project are taken into account in project management.

5 Data (Chapter 30)

5.1 Discuss the data requirements for determining values for assets, future benefits and future funding requirements.

5.2 Describe the checks that can and should be made on data.

5.3 Describe the circumstances under which the ideal data required might not be available and discuss ways in which this problem may be overcome.
5.4 Describe how to determine the appropriate grouping of data to achieve the optimal level of homogeneity.

6 **Risk management**  
(Chapters 42, 43 and 45)

6.1 Discuss the issues surrounding the management of risk.

6.2 Describe the tools that can be used to aid the management of risk.

6.3 Discuss the methods of measuring risk that can be used by the main providers of benefits on contingent events.

6.4 Describe how risks with low likelihood but high impact might be managed.

6.5 Discuss the use of scenario analysis, stress testing and stochastic modelling in the evaluation of risk

7 **Producing the solution**

7.1 **Modelling**  
(Chapter 29)

7.1.1 Describe the approaches available to produce the solutions.

7.1.2 Describe the use of actuarial models to support the methodology used in terms of:
- the objectives of and requirements for building a model
- the basic features of a model required to project future cash and revenue flows
- the use of these models for:
  - pricing or setting future financing strategies
  - risk management
  - assessing the capital requirements and the return on capital or the funding levels required
  - assessing the provisions needed for existing commitments to provide benefits on contingent events
  - pricing and valuing options and guarantees
- how sensitivity analysis of the results of the models can be used to help decision making.
7.2 **Assumptions**  
(Chapter 31)

Describe the principles behind the determination of assumptions as input to a model relevant to producing a specific solution having regard to:

- the types of information that may be available to help in determining the assumptions to be used
- the extent to which each type of information may be useful, and the other considerations that may be taken into account, in deciding the assumptions
- the level of prudence in the assumptions required to meet the objectives of the client.

7.3 **Expenses**  
(Chapter 32)

7.3.1 Describe the types of expenses that the providers of benefits on contingent events must meet.

7.3.2 Describe how expenses might be allocated when pricing products, schemes, contracts or other arrangements.

7.4 **Developing the cost and the price**  
(Chapter 33)

7.4.1 Discuss how to determine the cost of providing benefits on contingent events.

7.4.2 Discuss the factors to take into account when determining the appropriate level and incidence of contributions to provide benefits on contingent events.

7.4.3 Discuss the factors to take into account when determining the price or the contributions to charge for benefits on contingent events.

7.4.4 Discuss the influence of provisioning or reserving requirements on pricing or setting financing strategies.

7.5 **Investment management**

7.5.1 Discuss the principles and objectives of investment management and analyse the investment needs of an investor, taking into account liabilities, liquidity requirements and the risk appetite of the investor.  
(Chapters 25, 26, 27 and 28)
7.5.2 Discuss the different methods for the valuation of individual investments and demonstrate an understanding of their appropriateness in different situations. (Chapter 23)

7.5.3 Discuss the different methods for the valuation of portfolios of investments and demonstrate an understanding of their appropriateness in different situations. (Chapter 24)

7.5.4 Show how actuarial techniques and asset/liability modelling may be used to develop an appropriate investment strategy. (Chapter 28)

7.5.5 Discuss methods of quantifying the risk of investing in different classes and sub-classes of investment. (Chapter 28)

7.5.6 Describe the use of a risk budget for controlling risks in a portfolio. (Chapter 28)

7.6 Provisioning (Chapters 35 and 36)

7.6.1 Discuss the different reasons for the valuation of the benefits from financial and other products, schemes, contracts and other arrangements and the impact on the choice of methodology and assumptions.

7.6.2 Discuss how to determine values for provisions in terms of:
- the need for placing values on provisions and the extent to which values should reflect risk management strategy
- the principles of “fair valuation” of assets and liabilities and other “market consistent” methods of valuing the liabilities
- the reasons why the assumptions used may differ in different circumstances
- the reasons why the assumptions and methods used to place a value on guarantees and options may differ from those used for calculating the accounting provisions needed
- the use of replicating portfolios for valuing liabilities
- the use of stochastic deflators and other stochastic discount methods
- how sensitivity analysis can be used to check the appropriateness of the values
and be able to perform calculations to demonstrate an understanding of the valuation methods.

7.6.3 Describe different methods of allowing for risk in cash-flows.
7.6.4 Discuss different methods of allowing for uncertainty in present values of liabilities.

7.6.5 Discuss the purpose of and uses for equalisation reserves.

7.6.6 Describe the influence of comparisons with market values.

7.7 **Relationship between assets and liabilities**

7.7.1 Describe the principles of investment and the asset/liability matching requirements of the main providers of benefits on contingent events. 
(Chapter 27)

7.7.2 Discuss the use of portfolio theory to take account of an investor's liabilities. 
(Chapter 28)

7.7.3 Discuss the need to monitor investment performance and to review investment strategy. 
(Chapter 48)

8 **Living with the solution**

8.1 **Maintaining profitability** 
(Chapter 38)

Describe how the main providers of benefits on contingent events can control and manage the cost of:
- payments arising on contingent events
- expenses associated with the payment of benefits on contingent events.

8.2 **Determining the expected results** 
(Chapter 38)

8.2.1 Describe how a provider’s expected results can be projected.

8.2.2 Discuss the possible sources of surplus/profit and the levers that can control the amount of surplus/profit.

8.3 **Reporting actual results** 
(Chapters 37, 42 and 43)

8.3.1 Describe the reports and systems which may be set up to control the progress of the financial condition of the main providers of benefits on contingent events.

8.3.2 Describe the reports and systems which may be set up to monitor and manage risk at the enterprise level.
8.3.3 Discuss the issues facing the main providers of benefits on contingent events relating to reporting of risk.

8.4 Asset management (Chapter 28)

Describe the principles of asset management and allocation.

8.5 Capital management (Chapter 46)

Describe the principles of capital management.

8.6 Surplus management (Chapter 38)

8.6.1 Describe why a provider will carry out an analysis of the changes in its surplus/profit.

8.6.2 Describe how any surplus/profit arising may be distributed.

8.6.3 Discuss the issues surrounding the amount of surplus/profit that may be distributed at any time and the rationale for retention of surplus/profit.

8.7 Insolvency and closure (Chapter 34)

Discuss the issues that need to be taken into account on the insolvency or closure of a provider of benefits on contingent events.

8.8 Options and guarantees (Chapters 10, 35 and 45)

Discuss the issues surrounding the management of options and guarantees.

9 Monitoring (Chapters 32 and 48)

9.1 Describe how the actual experience can be monitored and assessed, in terms of:

- the reasons for monitoring experience
- the data required
- the process of analysis of the various factors affecting the experience
- the use of the results to revise models and assumptions.

9.2 Describe how the results of the monitoring process in the Actuarial Control Cycle or the Risk Management Control Cycle are used to update the financial planning in a subsequent period.
10 Have an understanding of the principal terms used in financial services and risk management. (Chapters 6, 7, 8, 44 and 49)