

Subject CM1

CMP Upgrade 2024/25

CMP Upgrade

This CMP Upgrade lists the changes to the Syllabus, Core Reading and the ActEd material since last year that might realistically affect your chance of success in the exam. It is produced so that you can manually amend your 2024 CMP to make it suitable for study for the 2025 exams. It includes replacement pages and additional pages where appropriate.

Alternatively, you can buy a full set of up-to-date Course Notes / CMP at a significantly reduced price if you have previously bought the full-price Course Notes / CMP in this subject. Please see our *2025 Student Brochure* for more details.

We only accept the current version of assignments for marking, *ie* those published for the sessions leading to the 2025 exams. If you wish to submit your scripts for marking but only have an old version, then you can order the current assignments free of charge if you have purchased the same assignments in the same subject in a previous year, and have purchased marking for the 2025 session.

This CMP Upgrade contains:

- all significant changes to the Syllabus and Core Reading
- additional changes to the ActEd Course Notes and Assignments that will make them suitable for study for the 2025 exams.

0 Retaker discounts

When ordering *retaker-price material*, please tick the relevant box when using the e-store.

Students have the choice of purchasing the full CMP (printed or eBook) or just the Course Notes (printed).

Further information on retaker discounts can be found at:

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1 Changes to the Syllabus

This section contains all the *non-trivial* changes to the syllabus objectives.

Objective 3.1.1 has been amended to read as follows (only the last 3 bullet points are different to the objective used for the 2024 exams):

3.1.1 Understand the following contracts, for example by explaining the timing and nature of the cashflows involved:

- whole-life assurance
- term assurance
- pure endowment
- endowment assurance
- whole-life level annuity
- temporary level annuity
- guaranteed level annuity
- deferred benefits (annuity and assurance)
- return of premiums annuity
- joint life and variable versions of all products

2 Changes to the Core Reading and ActEd material

This section contains all the *non-trivial* changes to the Core Reading and ActEd text.

Chapter 14

Section 6

A new subsection, 6.3, has been added to the end of Section 6. This includes some new Core Reading, as well as some additional ActEd text. This is shown below:

6.3 Return of premium annuity

A return of premium annuity is a type of deferred annuity that offers a unique feature. In the event of the annuitant's death during the contract's deferment period, the total sum of all premiums paid up to the date of the annuitant's death will be returned to the designated beneficiary.

With a more standard deferred annuity, if the policyholder dies during the deferment period, no benefit would be paid. However, with this return of premium annuity variation, the benefit payable to a specified dependent provides an element of protection. Prospective policyholders may find this attractive, and it may be seen as fairer in the event that the policyholder dies within the deferment period. If the policyholder does not die during that period, they will then start to receive the benefits from the deferred annuity as per normal.

The mode of premium payment for this annuity can be either a single premium or a non-single premium.

We consider the payments of premiums, to cover the cost of benefits of assurances and annuities, in Chapter 17.

Example: Mr Leo purchases a return of premium annuity with a yearly premium of £500. The annuity contract has a deferment period of ten years. Suppose he pays premiums for 6 years and then unexpectedly passes away. The total premiums paid until his death would be £3,000. In this scenario, his legal heirs will receive an amount of £3,000 as a death benefit.

If Mr Leo instead survived to the end of the ten-year deferment period, he would then receive the deferred benefit specified by the contract.

Chapter 22

Section 4

We have made a very minor correction to the sentence immediately prior to the start of section 4.1, on page 26. This now reads as follows:

It is also conventional to write the transition intensity (or force of decrement) due to cause k at age x in the multiple decrement model as $(a\mu)_x^k$.

3 Changes to the X Assignments

Overall

There have been very minor changes throughout the X assignments.

More significant changes are listed below.

Assignment X4

The very last line of the solution to part (i) of question X4.12 has been corrected, and now reads as follows:

$$L = 100,000 * (1 + b^{*(K+1)}) * v^T + l + e * a_{:K} + f * v^T - P * a_{due:K+1}$$

If you would like the new assignments *without* marking, then retakers can purchase an updated CMP or standalone X Assignments at a significantly reduced price. Further information on retaker discounts can be found at:

acted.co.uk/paper_reduced_prices.html

If you wish to submit your scripts for marking but only have an old version, then you can order the current assignments free of charge if you have purchased the same assignments in the same subject in a previous year, and have purchased marking for the 2025 session. We only accept the current version of assignments for marking, *ie* those published for the sessions leading to the 2025 exams.

4 Changes to the Y Assignments

Overall

There have been very minor changes throughout the assignments.

More significant changes are listed below.

Assignment Y1

All of the dates in question (and solution) Y1.1 have been moved forward by one year. This is purely to keep the question up to date, and does not impact the methodology or solutions in any other way.

In question Y1.2, the sentence immediately before part (iv) has been changed to read:

‘The annual rate of payment was £10,000 in the first year, and the rate of payment increased by 5% at the end of each 12-month period, with increases applying on the anniversary of the purchase each year.’

This change has been made purely to improve the clarity of the question. It does not impact the solution in any way.

If you would like the new assignments *without* marking, then retakers can purchase an updated CMP or standalone Y Assignments at a significantly reduced price. Further information on retaker discounts can be found at:

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5 Changes to the Mock Exam

Overall

For the Mock Exam Paper A, there have been very minor changes only.

For the Mock Exam Paper B, there have been minor changes throughout, including changes to mark allocations. There have also been some more significant changes to the Mock Exam Paper B, which are listed below.

Paper B, Question 2

Parts (v), (vi), (vii), (viii) and (ix) of this question have been removed.

Paper B, Solution 2

The solutions to parts (v), (vi), (vii), (viii) and (ix) of this question have been removed.

Paper B, Question 3

A new question, Question 3, has been added. An additional page with this question can be found at the end of this Upgrade.

Paper B, Solution 3

Additional pages can be found at the end of this Upgrade, with the solution to this new question.

The Excel components of the solutions are provided either:

- in the CM, CS, CP2: Mock and ASET Solutions 2025 course on The Hub at bpp.com/account, if you have not purchased Mock Exam Marking, or
- in the marking course on The Hub where your script was (or should have been) submitted, if you did purchase Mock Exam Marking.

If you would like the new Mock Exam *without* marking, then retakers can purchase an updated CMP or standalone Mock Exam at a significantly reduced price. Further information on retaker discounts can be found at:

acted.co.uk/paper_reduced_prices.html

If you wish to submit your scripts for marking but only have an old version, then you can order the current Mock Exam free of charge if you have purchased the same Mock Exam in the same subject in a previous year, and have purchased marking for the 2025 session. We only accept the current version of the Mock Exam for marking, *ie* those published for the sessions leading to the 2025 exams.

6 Other tuition services

In addition to the CMP, you might find the following services helpful with your study.

6.1 Study material

For further details on ActEd's study materials, please refer to the *Products* pages on the ActEd website at **ActEd.co.uk**.

6.2 Tutorials

We offer the following (face-to-face and/or online) tutorials in Subject CM1:

- a set of Regular Tutorials (lasting a total of five days)
- a Split Block Tutorial (lasting five full days)
- a Preparation Day for the Paper B exam
- six-day Bundles in both Regular and Block format, covering the five days for the Paper A exam, plus the Preparation Day for the Paper B exam
- an Online Classroom.

For further details on ActEd's tutorials, please refer to our latest *Tuition Bulletin*, which is available from the ActEd website at **ActEd.co.uk**.

6.3 Marking

You can have your attempts at any of our assignments or mock exams marked by ActEd. When marking your scripts, we aim to provide specific advice to improve your chances of success in the exam and to return your scripts as quickly as possible.

For further details on ActEd's marking services, please refer to the *2025 Student Brochure*, which is available from the ActEd website at **ActEd.co.uk**.

6.4 Feedback on the study material

ActEd is always pleased to receive feedback from students about any aspect of our study programmes. Please let us know if you have any specific comments (*eg* about certain sections of the notes or particular questions) or general suggestions about how we can improve the study material. We will incorporate as many of your suggestions as we can when we update the course material each year.

If you have any comments on this course, please send them by email to **CM1@bpp.com**.

3 You are given the following information about an internet-based project:

Cost of equipment required

- 10,000 in year 1
- 50,000 in year 3
- 60,000 in year 8 and every 5th year thereafter for as long as the project continues

The cost of equipment is assumed to be incurred at the start of each year, and all equipment is assumed to be disposed of with no value when it is no longer needed.

Salaries

- 30,000 *pa* per employee, inflating at 2% *pa* from time 0, the increases occurring on each project anniversary starting at time 1 (so the salary of a person who was employed over year 2 would be $30,000 \times 1.02$)

Staffing levels

- 1 employee from the start of year 2
- 5 additional employees from the start of year 4
- The staffing level is assumed to stay constant from the start of year 4 until the project terminates

Rent of office premises

- 12,000 *pa* from year 2 onwards, increasing every third year thereafter by 3%.

Payments of salaries and rent are assumed to occur at the start of each year.

Revenue

- 0 in year 1
- 5,000 in year 2

Revenue then doubles each year for the next 6 years, in years 9-12 it increases by 10% *pa*, and in year 13 onwards it increases by 2% *pa* until the project ends.

Revenue is assumed to be received at the end of each year.

The project is assumed to continue for 20 years, at which point all cashflows are assumed to terminate without additional profit or loss then being made.

- (i) Using a risk discount rate of 7% *pa* effective, calculate the discounted payback period and the net present value of the project. [9]
- (ii) Repeat part (i) assuming a risk discount rate of 9% *pa* effective, and explain carefully why the discounted payback period differs from that obtained in part (i). [4]

A special overdraft facility has been arranged with a bank to finance the project. All costs are to be met by withdrawals from the account, while all revenues from the project are to be credited to the account during the period while the balance of the account is negative. The bank charges an effective rate of interest on the account of 9% *pa* while it is overdrawn. The account is closed at the first project anniversary at which the account has a positive balance, at which point the balance is to be distributed to the project owners. All subsequent cashflows will be paid or received by the project owners as and when they arise.

- (iii) Identify the net present value of the project using a risk discount rate of 9% *pa* effective, and justify your answer. [2]
- (iv) Calculate the net present value using a risk discount rate of 7% *pa* effective and explain why this differs from the value calculated in part (i). [8]
- [Total 23]

END OF MOCK EXAM

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Solution 3

(i) ***Discounted payback period and net present value at 7% pa***

Outgoes are calculated in columns B-D and revenue in Column H. These cashflows are discounted in columns G and J (remembering that the outgo occurs at the start of each year and the revenue at the end of each year). The total present value of each year's cashflow is in Column K.

The net present values (NPVs) of the cashflows up to and including the current year are calculated in Column L.

The discounted payback period (DPP) is found by identifying (by eye) the first year in which the NPV in Column L turns positive. This is year 15, and so the DPP is equal to 15 years.

The net present value after 20 years is 361,928 (cell L33).

<i>Cashflows</i>	[3]
<i>Present values</i>	[3]
<i>NPV</i>	[2]
<i>Discounted payback period</i>	[1]
	[Total 9]

(ii) ***Discounted payback period and net present value at 9% pa***

The same procedure as in part (i) is followed but with a risk discount rate of 9% in cell C6.

The DPP increases by two years to 17 years, and the net present value assuming termination after 20 years is 163,408.

Comments

The DPP has increased by two years to 17 years. An increase in the risk discount rate causes the cashflows at all durations greater than zero to be more discounted than previously. However, the present values of later duration cashflows are much more reduced than the earlier duration cashflows.

Because the early net cashflows are negative and the later net cashflows are positive, then the present values of the positive net cashflows are more reduced than the present values of the negative net cashflows when the risk discount rate is increased. Hence it takes longer for the total present value of the cashflows to date to become positive, and so the DPP increases.

<i>NPV</i>	[½]
<i>Discounted payback period</i>	[½]
<i>Comments</i>	[3]
	[Total 4]

(iii) **Net present value at 9% pa with overdraft arrangement**

The overdraft makes no difference to the net present value when the risk discount rate and the loan interest rate are the same. Hence the net present value assuming termination after 20 years is the same as in part (ii), ie 163,408.

<i>NPV</i>	[1]
<i>Comments</i>	[1]
	[Total 2]

(iv) **Net present value at 7% pa with overdraft arrangement**

In rows 13-29, columns G and H now calculate the *accumulated* value at 9% pa of the cashflows for the year as at the end of the year, for the first 17 years. Column I then shows the total accumulated value to the end of the current year of all cashflows to date, which is therefore the overdraft account balance at that point. The balance first becomes positive at the end of year 17, which is the same as the discounted payback period calculated at 9% pa, as we would expect.

Alternatively we could calculate the 17-year account balance by taking the total present value of the first 17 years' cashflows at 9% pa (which is the value in cell L29 of tab '(ii) and (iii)' of 35,495.68) and accumulating it at the same rate of interest over 17 years. That is:

$$\text{Account balance after 17 years} = 35,495.68 \times 1.09^{17} = 153,612$$

This amount is discounted at the risk discount rate of 7% pa in cell J29 of tab (iv).

In rows 33-35, columns G, H and J show the present values of the yearly cashflows for years 18-20 at the risk discount rate. The total net present value is calculated to be 235,562 (cell J36).

Comments

Without the overdraft arrangement, the net present value at a risk discount rate of 7% pa was higher, at 361,928.

With the overdraft arrangement, while the account is in deficit, the bank is imposing a charge to the project in the form of the extra 2% pa interest rate over the risk discount rate. This will reduce the net amount of cashflow that can be distributed to project owners and so the net present value reduces.

<i>Cashflows</i>	[3]
<i>NPV</i>	[3]
<i>Comments</i>	[2]
	[Total 8]

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