ACTUARIAL SOCIETY OF SOUTH AFRICA

COMPUTER-BASED EXAMINATION

7 April 2026 (pm)

Subject A213 — *Contingencies Intermediate Technical*

Examination writing time: One hour and forty-five minutes (includes fifteen minutes of reading time)

Upload time: Five minutes

[Total time on examination countdown timer: One hour and fifty minutes]

Total marks: 50

INSTRUCTIONS TO THE CANDIDATE

Failure to adhere to any of these instructions could incur examination sanctions including disqualification from the examination.

1. *Your examination countdown timer reflects your TOTAL examination time. Reading and writing time is one hour and forty-five minutes.* ***You may NOT continue to write during the five minutes upload time as this could lead to disqualification from the examination.***

2. *The question paper is only available on the ASSA Exam Platform and may not be printed.*

3. *You are required to submit your answers in Excel format ONLY using the answer template provided. No answers in any other format (e.g. handwritten) will be accepted. Save work regularly.*

4. *Use only the Excel answer template provided in your personal folder under the "Exam" icon on your desktop. The file has already been named using your candidate number. Please confirm that your candidate number matches the candidate number used in the file name. If there is any discrepancy, notify an invigilator immediately. Do not rename your file and do not create multiple versions.*

5. *Ensure that your* ***Candidate Number*** *is entered on the first sheet of your Excel answer template.* ***Ensure that you do NOT include any personal information, such as your name or surname, in any part of your submission, including within Excel comments. Your candidate number must be the only identifier used. Submissions that are incorrectly labelled or cannot be clearly identified by candidate number may not be marked and may result in forfeiture of the examination attempt.***

6. *You may not access any file from your computer, use any other computer software (e.g. Email), or open or use any other browser, collaboration tools or AI tools, including those embedded in MS Word and Adobe AI assistant (e.g. Copilot, ChatGPT etc.) during the examination. Embedded AI tools must be disabled. You may not use Grammarly, Grammarly Premium or similar built-in language and grammar tools which must also be disabled.*

7. *You are not permitted to bring any other material into the examination (e.g. a Formulae and Tables book). Any such information/material that may be required will be provided to you in the examination.*

8. *You are strongly encouraged to use the first fifteen minutes as reading time only, however, you may start answering the paper whenever you are ready.*

9. *Mark allocations are shown in brackets.*

10. *Attempt all questions. Each question must be answered on a separate Excel sheet as per the template provided.*

11. *Ensure that your column headings clearly describe the calculations performed in each column, and that complex calculations are broken down into sensible intermediate steps so that your workings are easy to follow.*

12. *Show calculations where appropriate. No materials may be used other than blank paper for calculations. Only calculators from the ASSA-approved list are permitted.*

13. *Upload a single version of your Excel answer file only to the ASSA Exam Platform. Once uploaded, click* ***Finish Attempt.*** *You may still use* ***Review Attempt*** *to check that the correct version has been uploaded, provided you have time remaining. When you are satisfied with your upload, you must click* ***Finish All and Submit*** *to complete your submission. After selecting this option, no further changes can be made. Candidates remain fully responsible for ensuring that the correct file is uploaded, in the required format, size, and location, within the scheduled examination time. The submitted file will be treated as the final version and cannot be replaced or amended.* ***Please note that no typing or editing of answers is permitted during the final five minutes allocated for upload time.***

14. *ASSA will not retrieve, replace or amend answer scripts where incorrect, incomplete or unintended versions are uploaded, nor where candidates subsequently notify ASSA after the conclusion of the examination session that an incorrect file was submitted.*

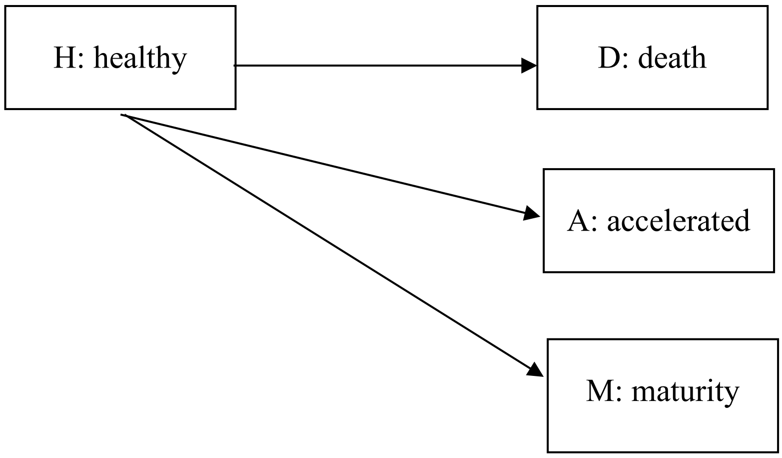
15. ***You must submit your Excel answer document onto the ASSA Exam Platform BEFORE the time on your examination countdown timer runs out.***

Note: The Actuarial Society of South Africa will not be held responsible for loss of data where candidates have not followed instructions as set out above. The onus remains on you to read and implement all examination instructions.

END OF INSTRUCTIONS

QUESTION 1

A life insurer uses a three-state model to price a special accelerated death benefit policy. An accelerated benefit is a benefit that is paid to the policyholder on diagnosis of a specified medical condition. This brings the payment of a portion of the death benefit forward to before the date of death, with the policy ceasing on the payment.



The benefits provided are:

- R1,000,000 on death from the healthy state
- R500,000 on being diagnosed with a condition making the policyholder eligible for the accelerated benefit.
- R2,000,000 if the policyholder survives to maturity

The policy ceases if a death benefit or an accelerated benefit is paid. Benefits are paid immediately on death, diagnosis and maturity. Level premiums are paid annually in advance while the policy is in force.

Basis:

Mortality	The independent force of mortality is 75% of the force of mortality according to the AM92 ultimate mortality table
Accelerated benefit	The independent force of being diagnosed with a condition is 20% of the independent force of mortality for the same age
Interest rate:	7.5% *per annum* effective
Expenses:	None

You may assume that the forces are constant between consecutive integer ages.

A policy with a term of ten years is sold to a healthy life aged 65 exact.

i. Calculate the premium for this policy.

[12]

ii. Calculate the premium for a policy without a maturity benefit.

[1]

iii. By comparing the two premiums you have calculated, discuss the possible success the company will have in selling the two versions of the product.

[2]

The company is considering paying a death benefit from the accelerated state.

iv. Discuss possible reasons the company may be considering such a benefit as well as any implications of making such a change.

[3]

[Total 18]

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QUESTION 2

A life insurer sells a ten-year unit linked endowment assurance policy to a life aged 60 exact. The details of the policy are:

- Level premiums of R10,000 per annum are payable annually in advance throughout the term of the policy or until earlier death.
- 75% of the premium is allocated to units in the first policy year and 95% in the subsequent policy years.
- The units are subject to a bid-offer spread of 5%.
- An annual management fee of 2.5% of the value of the units is deducted at the end of each policy year before any benefits are paid.
- The death benefit, payable at the end of the policy year of death, is three times the value of the units at the end of the policy year of death after the deduction of the management charge.
- On maturity, 100% of the value of the units is paid.

Basis:

Investment return on the unit fund	8% *per annum* effective
Investment return on the non-unit fund	6% *per annum* effective
Mortality	AM92 Ultimate
Initial expenses	R500
Renewal expenses	R150 *per annum* on the second and subsequent premium dates
Risk discount rate	10% *per annum*

i. Calculate the expected net present value of the future profits, ignoring reserves.
[12]

ii. Calculate the revised expected net present value if negative non-unit cashflows are zeroised.
[5]

iii. Discuss why the company would opt to zeroise the non-unit cash flows.
[2]

[Total 19]

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QUESTION 3

An insurance company sells a ten-year joint life term assurance policy to a male and female each aged 50 exact. The sum assured of R1,000 is payable on the first death. The benefit is paid at the end of the policy year of death. The sum assured reduces by half at the start of the sixth policy year. Policyholders pay level annual premiums in arrears.

Basis:	
Mortality	AM92 Select. Mortality for females is assumed to be that of males five years younger. Assume that the mortality of the two lives is independent.
Interest rate:	7.5% *per annum* effective
Expenses:	Ignore

i. Calculate the expected present value of the policy benefits.

[5]

ii. Calculate the variance of the present value of the benefits.

[4]

iii. Discuss whether you consider the assumption of independent mortality made above to be appropriate or not in general.

[2]

iv. Discuss any possible problems that the company could experience with the timing of premium payments.

[2]

[Total 13]

[GRAND TOTAL 50]

REMEMBER TO SAVE

END OF EXAMINATION

