

EXAMINERS' REPORT

June 2025 examinations

Subject F108 — *Health, Social and Employee Benefits* Fellowship Principles

INTRODUCTION

The attached report has been prepared by the subject's Principal Examiner. General comments are provided on the performance of candidates on each question. The solutions provided are an indication of the points sought by the examiners, and should not be taken as model solutions.

QUESTION 1

i.

Aspect	Mutuality	Solidarity
Explanation	When contributions/premiums are paid according to risk and benefits are paid either in accordance with need or in accordance with an agreed schedule of benefits. In this case, participation may be voluntary (Traditional insurance)	When contributions are not related to risk, but rather shared equally or paid according to ability, and benefits are paid either in accordance with need or in accordance with an agreed schedule of benefits. Social solidarity requires mandatory participation in a risk pool.

ii.

Aspect	Mutuality	Solidarity
Example in Health	Health insurance where only members/policyholders benefit from contributions/premiums.	National Health Insurance (e.g., South Africa's proposed NHI), where everyone contributes based on ability and benefits based on need.
Example in Pensions	A private pension fund where members contribute to and benefit directly from the fund.	State pensions funded through taxes, where working individuals support retirees collectively.

iii.

- In multinational models of benefit provision, individual needs are met through numerous layers of protection from different providers.
- Social assistance (Tier 1) benefits are run on a solidarity basis;
- As these protect the most vulnerable in society who are unable to make any contribution towards the system themselves
- Social insurance (Tier 2) benefits blend mutuality and solidarity
- In that they are contributory benefits where the benefit bears some relation to the contribution
- But there are often significant cross-subsidies
- In order to benefit "vulnerable" group eg low earners and women
- In employer-provided benefits (often Tier 3), mutuality and solidarity are blended again
- But with a greater emphasis towards mutuality
- For example, group risk is community-rated but there tend to be fewer minimum and maximum benefits
- Might be some flexibility in benefits
- Voluntary benefits (Tier 4) work mainly on a mutuality basis
- Allows people to choose benefits to meet their specific needs

- However, regulation may limit rating factors or enforce cross-subsidies, there is this still an element of solidarity.

Examiner comments: This question was generally poorly answered, with many students struggling to distinguish clearly between the concepts of mutuality and solidarity. Responses were often too brief, repetitive, or incomplete, with several students failing to address all parts of the question.

In part (i), many students ignored the command verb “compare and contrast,” which required direct linkage between the concepts of solidarity and mutuality in order to highlight both similarities and differences.

Part (ii) was also frequently misinterpreted. Instead of providing one example each for health and retirement benefits under each term (mutuality and solidarity), many students only gave one example per sector. In addition, several examples provided were unclear or inaccurate, reflecting a poor understanding of the definitions explored in part (i).

Part (iii) required sound content knowledge, but many students referred to the “pillars” of social protection rather than the “tiers” of the ILO model, despite the question’s clear instruction. As a result, marks were deducted where “pillars,” “layers,” or “levels” were used in place of “tiers.”

Finally, students often overlooked the requirement to discuss each tier in terms of both the benefits it provides and its alignment with mutuality or solidarity. This resulted in incomplete or superficial responses.

QUESTION 2

i.

1. Cost Savings / Potential Reduction in Claims Costs

- Home-based care is often more cost-effective than extended hospital stays,
- as it reduces expenses related to hospital resources such as beds, medical staff, and infrastructure.
- The care is being provided at the appropriate level e.g. not using a doctor for a service a nurse can provide
- And this experience may encourage recipients to choose nurse-based care in future
- Effective home-based care for chronic conditions may prevent complications and reduce future claims for expensive treatments/Resolves transport issues and inconvenience factors which means people who might otherwise avoid treatment get treated.
- Health worker can assess for deterioration of condition while administering home-based care allowing for appropriate intervention /Early intervention and continuous monitoring at home can help manage long-term health risks.

2. Reduced Pressure on Hospital Resources

- Eases hospital congestion by allowing stable patients to receive care at home instead of occupying hospital beds.
- Ensures that hospital capacity is available for more critical patients, improving efficiency in healthcare delivery.

3. Enhanced Member Satisfaction and Retention

- Offering personalized home care improves member experience and satisfaction, strengthening HealthyLives's reputation.
- Satisfied members are more likely to renew their policies and remain loyal to HealthyLives, reducing customer churn.

4. Competitive Differentiation

- HealthyLives could be distinguishing itself from competitors by offering home-based care services as part of its medical aid plans.
- This helps attract new members (especially young families) who value flexible, high-quality healthcare services.

5. Improved Member Health Outcomes

- Patients tend to recover faster and experience less stress when treated in familiar home environments.
- Home-based care can reduce hospital-acquired infections, leading to better patient health outcomes and fewer readmissions.

ii.

Risks to HealthyLives Medical Society (HLMS):

- HLMS bears legal and reputational responsibility if home-based care leads to medical complications,
- ...such as incorrect IV administration which may result in medical negligence claims.
- Ensuring consistent service standards across a wide geographic area is difficult,
- ...especially when relying on a mix of nurses and care workers.
- The logistical burden of coordinating home visits, staffing, and supplies increases the chance of errors, missed appointments, or inefficient service delivery. This reflects badly on HLMS.
- If uptake of the service is higher than projected, or if patients require more visits than planned, HLMS could face unanticipated cost pressures or not realise the cost savings that were expected.
- Negative patient experiences, poor outcomes, or media coverage of service failures could harm HLMS's brand and reduce trust in the scheme.
- There is potential for fraudulent claims by service providers (e.g., billing for services not rendered or inflating service durations), or even abuse by members (e.g., requesting unnecessary visits or falsely claiming eligibility).
- Poor integration of home-care records with the broader HLMS system may lead to incomplete patient data and continuity-of-care issues.

Risks to Patients:

- In case of complications (e.g. allergic reactions or sudden deterioration), patients at home may not receive timely emergency care.
- C@H may have caps on the number of visits (e.g., 3 postnatal visits) or limits on the scope of care provided. If patient needs exceed those limits, they may be left without sufficient care or be forced to seek costly alternatives (not covered by HLMS).
- The home environment may lack the sterile conditions required for procedures like IV therapy increasing infection risk.
- Without the support of hospital diagnostic tools or specialists, some conditions may go undetected or not be escalated promptly.

- Patients and family members may be required to monitor aspects of care themselves between visits, creating risks if instructions are misunderstood or not followed.
- Limited coordination between the C@H team and other healthcare providers (e.g., GPs, specialists) could lead to fragmented or duplicated care.
- Allowing strangers into one's home, even qualified staff, may raise privacy or personal safety concerns for some patients.
- If the C@H service is only available on select plan options (e.g., higher-tier or comprehensive plans), lower-income or basic-plan members may be excluded from accessing home-based care. This may lead to reputational risk as it may be perceived as unfair.

Examiner comment: Most students performed adequately in this question. However, in part (i), the cost-saving benefits were generally not addressed in sufficient depth. Additionally, some students appeared to treat Care@Home (C@H) as a standalone product rather than recognising it as a component of the broader PMI offering. This led to irrelevant points about pricing, as the cost of the Care@Home benefit would have a negligible impact on the overall PMI premium, given that it applies to only a small subset of the risk pool.

Repetition was also a concern. Several students repeated the same reasoning for both the IV benefit and the postnatal benefit, expecting credit for each. This reflects poor exam technique and a lack of precision in argumentation.

In part (ii), structuring was a particular issue. Many responses did not clearly distinguish between the implications for HLMS and those for the patient. Students who structured their answers clearly and separated these perspectives generally performed better than those who did not.

QUESTION 3

i.

- Tax advantages
- Make retirement savings accessible
- Employees may not purchase risk cover if left to their own devices
- Retirement benefits encourage members to keep working until retirement
- Retirement benefits help employees manage their retirement and provide support at retirement
- Reduce costs to employees – group risk benefits typically cheaper than individuals accessing the same benefits directly from providers
- No individual risk rating in group risk benefits – employees in poorer health get cover they could not get in the retail market
- Employer negotiates contract and premiums on employees' behalf
- Trumple offers flexible benefits so employees can choose appropriate levels of cover for their individual needs
- And they can change their benefit levels as circumstances change
- Benefits and costs are transparent
- Employees don't have to arrange payments to providers – deducted from salary by employer
- Provides a commitment device

ii

- Contributions for risk benefits and retirement savings are deducted from employees' salaries reducing their take-home pay/Employees face a trade off between contributions to risk benefits and take home pay, as Trumple uses cost-to-company basis
- However disposable income may be influenced by the proportion they allocate to take-home, risk benefits and retirement depending on existing tax incentives
- If employees choose higher levels of risk benefits this may result in them choosing a lower contribution rate to their retirement savings –
- effectively moving risk of adequate financial cover from today to their future retirement and exposing them to the risk of not having adequate retirement savings
- and vice versa
- Employees may choose to underinsure their own risks so that they can have higher take home pay
- Generally expect employees with higher salaries to choose higher benefits as they have fewer financial constraints on take-home pay than lower-income earners

iii.

- LSM reduces risk as members get older
- So higher risk asset classes at younger ages as longer time horizon
- Alternatives and less liquid asset classes may be used
- Volatility may be accepted
- Equities, real estate, commodities for example
- Then a more conservative strategy as members get older
- Using bonds, cash

- With limits on alternative assets or illiquid assets or risky assets
- As time horizon is shorter
- And capital protection is important
- Volatility needs to be limited

iv.

- Reduce volatility in retirement savings value close to retirement
- And so reduce risk of capital loss in retirement savings close to retirement
- Risk of having a conservative strategy at younger ages when risk can be taken
- And thus the risk of not achieving a return above inflation over the long term
- Stay competitive as a Fund – if most funds offer LSM (this point applies to member choice as well)

Risks managed by member choice –

- Members want flexibility so this keeps them in the fund And possibly encourages higher contributions
- Members have specific personal financial needs that can be managed better by choosing where their retirement savings are invested
- Risk remains that options are not entirely suitable for the member's unique circumstances but Fund can't select an individual strategy for each individual person so this is a compromise
- Only limited options available so members don't make inappropriate decisions
- And encourages them to make a decision ie don't overwhelm
- E.g. don't include cash as an option as members don't realise they sacrifice real returns for capital protection
- And having a limited offering may make fee negotiations with the asset managers more favourable

*Examiner comment: For part i it was important for candidates to apply the list from their notes. Marks were not awarded for stating benefits to the employer. For part ii few candidates noted that higher contributions or premiums result in higher benefits. Part iii was well answered with most candidates scoring full marks. Part iv was trickier as it asks for the risks that are **managed**, and not the risks **of**.*

Overall lower scoring papers for this question were not able to provide enough distinct points across the four parts and many candidates tended to repeat points.

QUESTION 4

i.

- Actuarial is developed and hence likely has an ageing population.
- A great deal will depend on if Actuarial's population is expected to age further or stabilise
- And hence the overall anticipated demand for elder care relative to supply
- Also as LTCI is a long-term product, much will depend on whether this reduced level of state support is anticipated to persist.

Downward pressure

- The reduction in state benefits is likely to increase the demand for LTCI cover
- This could increase the business volumes for ABC
- Increased business volumes can reduce the fixed expense loadings and hence reduce the premiums
- There may also be more competitors entering the market
- This will put pressure on margins in premiums that could reduce premiums
- Greater demand may also reduce anti-selection which will reduce premiums
- Since there will be a better spread of risk across policies
- Through lower incidence rates and also lower underwriting costs
- Care providers who have less state-funded patients may reduce their rates
- This will translate to lower claim costs and lower premiums

Upward pressure

- The policy benefits may have been reduced by state benefits/The state and retail benefits may have been integrated
- So the amount of cover provided by the policies may need to increase
- Which will increase the cost of cover
- Care providers may have been able to cross subsidise their private rates from state patient rates and now need to increase their rates
- This will increase the cost of claims

Conclusion

- Hence it is very unclear how the change will affect the required premiums

ii.

- If there is a reduction in premiums, ABC will need to review the new policy rates to remain competitive
- May monitor the market rates to see what adjustment is required to remain competitive/There is more pressure to do so if competitors also cut rates
- It may be possible to reduce rates for existing business (eg if reviewable)
- Even if not reviewable, the regulator is likely going to look favourably on any attempts to improve benefits/cut rates.
- But might need to increase benefits instead /So it may make a special offer to existing policyholders in order to retain the business
- If ABC does not adjust rates for existing business it may face lapse and re-entry risk
- Which can be anti-selective i.e. those in good health more likely to switch policies

iii.

Steps to reduce anti-selection

- Underwriting at the point of entry (and declining high risk cases)
- Marketing to encourage take up by broad group
- Max age at entry

- Waiting period before the benefit is paid
- Assessment process for benefit triggers
- Encouraging healthy behaviour/marketing to a healthier target market

Examiner comment: Only a few candidates made sufficient distinct points to score well under part (i). Surprisingly few candidates noted that the extent of benefits covered by the policy may increase due to the more constrained state benefits. A number of candidates seemed to suggest that increased demand would automatically increase premiums rather than linking this to the increased cost of cover if on an indemnity basis. Parts (ii) and (iii) were reasonably well answered but for part (iii) credit was not given for limited benefits as a measure to specifically reduce anti-selection.

QUESTION 5

i.

- Provides a lump sum in the event of the policyholder requiring to undergo a significant medical procedure (specified)
- Likely to be a table of procedures with corresponding lump sums per procedure to aim to cover the likely cost of the most common procedures
- Outpatient episodes are excluded
- Pre-existing exclusions will apply
- Premiums likely monthly
- (Usually) Annually renewable (short-term)
- And reviewable (benefit, premiums, etc.)
- Age-rated, with likely a maximum age
- Possibility of more than one claim
- Cost of treatment may be greater than benefit, but benefit is a known lumpsum per procedure/not an indemnity policy
- Uncertainty around the incidence of claims
- Benefit definitions/criteria to qualify for benefit very important – loopholes, misunderstandings
- Reporting/settlement delays expected to be minimal
- Without-profits (non-participating)
- No discontinuance (lapse) benefits

ii

- UPR: The amount set aside from premiums written before the valuation date to cover risks incurred after the date
- URR: The amount set aside to cover claims and expenses expected to arise from expired cover.
- An AURR may be required to lift the UPR level to the URR level (if the premiums are insufficient for the risk)
- Both the UPR and URR will be zero
- These policies are at the end of their contract term
- And these provisions are proportional to the outstanding contract term
- If they are renewed, on 1 Jan, then a new provision for the UPR and URR will be created but this is after the valuation date

iii.

- Assume uniform distribution of claims
- Note that UPR and URR for Jan 2024 tranche is zero
- $UPR = \text{sum}((\text{number of months of cover remaining}/12) * \text{number of policies}) * \text{monthly premium} * 12$
- $= 250 * 12 * (460 * 3 + 520 * 6 + 650 * 9) / 12$
- $= R2\ 587\ 500$
- $URR = UPR * \text{loss ratio}$
- $= 0.86 * 2\ 587\ 500$
- $= R2\ 225\ 250$

iv.

- Use the UPR as it is higher than the URR and you want to be prudent in a valuation
- The observation that there are more claims in winter than in summer indicates some seasonality in claims
- It is unlikely that more procedures are required in winter vs summer
- So, this seasonality is likely for planned, non-urgent procedures
- Winter is more convenient for both doctors and patients, due to travelling, enjoying the warmer weather, as compared with undergoing and recovering from a medical procedure
- This will not be applicable to emergency or urgent procedures.
- The observation that claims increase drastically in the last few months of the policy term may be an indication of anti-selection or worse, fraudulent behaviour
- Knowing that cover will lapse, may cause more policyholders to seek treatment that they would otherwise have postponed or possibly not had at all.
 - o Use it or lose it mentality
- Doctors may also be more likely to recommend covered procedure vs other alternatives given the existence of the insurance cover
 - o 3rd party payer problem
- There may be policy loopholes or terms that are being exploited at the expense of the insurer

Examiner comment: Overall, the question was not well-answered, with many candidates not knowing the key features of an MME policy and the details of the cover provided by such a policy. Furthermore, some confusion existed around the definitions of UPR and URR, and very few candidates commented on what the values of these would be for policies incepted 1 year ago as asked in the question. The calculation was hit-and-miss. Those who made an attempt at it and calculated the outstanding months of cover for each cohort of policies and multiplied these by the premium, and converted it to annual scored well. The last part of the question was fairly well-answered, but few noted that both of the trends could be indicative of selection and that these claiming patterns are likely to be driven by elective surgeries.

QUESTION 6

i.

- They could remove medical or lifestyle or financial underwriting.
 - But need to consider the increase in claim rates due to anti-selection.
- HealthSure could reduce the number of cases that go through the underwriting process.
 - For example, they could analyse how many cases are fully underwritten but where no additional premium is ultimately charged, to determine whether there are ways to avoid such cases unnecessarily going through the full underwriting process.
- HealthSure could increase the limits at which further evidence is required e.g. increase the sum assured above which a medical test is required
 - or increase the free cover limits/evidence if health limit if it writes group business.
 - Most underwriting processes have tiers of underwriting with more expensive underwriting as the risk goes up so numerous thresholds would need to be tested.
- HealthSure should compare the costs involved in obtaining further evidence at lower sums insured versus the additional premium charged and/or the savings in respect of cases refused to see if current procedures are efficient.
- Can try make underwriting cheaper but still effective
 - HealthSure could include more detailed questions on the application form which means no further underwriting required beyond the application form.
 - But need to weigh this against the extra administrative costs of capturing the info (ie could shift underwriting costs to another area)
 - HealthSure could carry out less expensive on-line automated underwriting checks/use AI
 - HealthSure could outsource its underwriting if cheaper.
 - HealthSure could reduce the fees paid to professionals or negotiate special rates
 - or they could use lower qualified professionals, e.g. nurses rather than doctors for medical testing.
 - HealthSure could also review (and aim to increase) the number of cases handled by each member of underwriting staff underwriters to
 - This can be done by improving staff training or simplifying the process they need to follow or implementing online tools to assist
 - But this only tackles the salary-related component and not testing costs
- Use measures other than underwriting to control morbidity risk
 - HealthSure any could decline more cases rather than putting them through underwriting in order to determine an appropriate additional premium.
 - For example, in the extreme, only those that answer all of the health questions positively could be offered cover.
 - But this needs to be weighed up against the reputational problems this may cause
 - And may harm new business volumes especially if relying on brokers
 - HealthSure could rely more heavily on exclusion clauses or have simple rating scales for substandard risks.
 - HealthSure could extend the waiting period
 - HealthSure could consider modifying the product design so that it requires less underwriting.
- HealthSure will need to factor in that the implementation costs will be higher for some of these proposals initially but overall the costs should be lower in the longer term.

ii.

- Offering a screening benefit means comes at a cost - Cost for the actual screening
 - as well as for administering the screening and collecting and processing the result
- This needs to be weighed against the benefits, including additional data to understand the underlying exposure to risk/Better risk management of underlying risk pool
- This additional data can be used in pricing reviews
- As well as pricing new business
- Higher chance of earlier detection
- Which gives the policyholder an opportunity to treat and manage before this becomes a CI claim.
- If this is a tiered product, even if a claim does occur may be at a lower level of prevention.
- Opportunity to create awareness and encourage prevention, even for those not flagged as high risk in the screening.
- This may be seen as an attractive additional benefit to new and existing policyholder, especially if not offered by other competitors in the market OR
- May be a way of attracting new business – especially lower risk lives as they get some benefit even if not claiming
- May assist with better retention of existing if seen as a value add

iii

Data

- Need to collect data on the average hours of exercise per week
- This could be done using fitness device data or asking policyholders to log their exercise
- However, it is worth noting that self-reported data tends to be very unreliable, so tech is preferable
- But need to note data protection and privacy issues

For self-reported:

- Could add a question to underwriting form
- But these are long-term policies and behaviour can change over time
- Regular surveys e.g. could survey policyholders every 3 months would be preferable
- Could use historically exercise data and incidence rates if available
- Need to ensure credible volume of data available
- Would also need stroke and heart attack claim data linked to these exercise records
- As well as other known rating factors

Model

- Select model type – likely to be a glm model and a binomial model (yes or no – for claim incidence)
- Average exercise per week will need to be one of the model (independent) variables together with other known rating factors.
- Be careful of correlations between the independent variables/collinearity
- Need to be a categorical variable to split out different groupings of hours of exercise per week
- Ensure model fit is statistically significant
- And that the data is appropriate for this type of model ie all statistical criteria for model validity are met
- Determine if there is a relationship between claim incidence for heart attacks and strokes and average hours of exercise per week (significant p value of exercise coefficient)
- Could sensitivity test results by using a different data set

Examiner comment Overall candidates performed reasonably well on this question. Part (i) was well attempted by most candidates, however to score well candidates needed to also discuss the impact of their suggestions - for example how it may impact competitive position, new business and retention rates and/or claims experience. Some candidates also struggled to generate enough points to score well. Part (ii) was well answered by most candidates as they were able to provide a wide range of points weighing up costs versus benefits that were applied well to the specifics of the question. Part (iii) was poorly answered by most candidates. Candidates tended to provide very generic data collection and modelling points without any application to the specific context given in the question. Credit was only given if applied to the question.

QUESTION 7

i.

Whether any distribution is appropriate:

- Whether the fund has a full solvency reserve and other contingency reserves or if the surplus should be put towards those/ earmarking the surplus against a specific risk e.g. investment risk
- Size of the surplus – wouldn't bother for a small amount as
 - The cost of the analysis and distribution may exceed the surplus itself
- Surplus trend – has a surplus or deficit arisen over the intervaluation period.
 - The longer the surplus has been around, the more likely it is to be intransient and hence appropriate to distribute
- Lever leading to the surplus/AOS
 - (some sources of surplus are likely to reverse quickly)
- Cost of the full allocation exercise

If a distribution is appropriate

- The Fund rules
- Any reasonable expectations members may have through:
 - Past practice
 - Fund communication
 - Market practice
- The group that bore the risk leading to the surplus
 - Need to consider employer, actives and pensioners
- How it will be allocated
 - e.g. would you give pensioners an increase in their pension or a once off 13th cheque
 - Admin constraints
 - As well as costs
 - Ease of communication
 - Need to consider very carefully the risks introduced by the different choices e.g. a distribution to active members has greater long-term implications than a 13th cheque
- Equity issues: particularly when dealing with different generations of members
- Industrial relations issues that may arise if the employer gets surplus allocated and not members

In both cases need to consider:

- Tax implications to the recipients
- Regulatory and legislative constraints
 - (e.g. a surplus distribution in SA requires a separate regulated test)
 - Whether an employer can remove surplus from the fund.
- Any professional guidance

ii.

- Assuming $i > e$

- Under the Attained Age Method (AAM) and Projected Unit Method (PUM), the Actuarial Liability will be exactly the same
 - If calculated on the same basis with the same data and effective date
- So there will be no surplus released on changing valuation method in this case
- However, the AAM contribution rate is intended to be calculated only once and be level for the future lifetime of the fund
- It therefore starts off higher than the PUM
- So switching to the PUM would lower the SCR initially
- The adjustment for the MCR would be the same for both methods
- However, over time the PUSCR would climb exponentially
- Particularly in a closed fund
- Meaning the employer contribution rate would need to rise to avoid a deficit emerging.
- Whereas on the AAM the slightly higher contribution rate initially builds up a bit of surplus in the fund
- Which can then be used to offset later increases as the fund ages.

iii.

- Longevity swap
 - Contract between fund and swap provider E.g. bank or insurer
 - The fund pays a series of payments to the swap provider based on expected longevity
 - And the provider pays the fund based on actual longevity
- Buy-in
 - Fund buys pensions to back each member liability
 - Liability remains on funds balance sheet
 - Insurer often will pay the pensioner directly but the fund can be used as a conduit
- Buy-out/Outsourcing
 - Fund buys pensions for each member liability in the name of the member
 - All longevity risks and risks related to the pensioner book are transferred
 - Liability completely removed from fund balance sheet/Fund plays no further role

Examiner comment: In general, candidates showed better familiarity with pension funds than in the last sitting. However, some of the answers for part i suggested that several candidates were relying on their knowledge of with-profits life insurance policies. The following references in answers were indicative of this problem:

- *Referencing consideration of what “competitors” were doing. Most employer-sponsored DB schemes are compulsory for eligible employees and this type of benefit is generally not available commercially so the competitive market forces you would find for say a retirement annuity fund are not present. Reference to comparable funds was acceptable.*
- *Ignoring the sponsor completely or on the other extreme talking about the sponsor’s expansion plans and their cost of capital.*
- *Implying that all members, including pensioners, must pay contributions and these contributions will vary with experience. Candidates who went down this route implied that*

members could receive contribution holidays or reduced contributions instead of additional benefits. A DB fund sponsored by an employer is almost always structured on a “balance of costs” basis whereby the member contribution is fixed and the employer contribution varies. Pensioners do not pay contributions. Hence any contribution holiday or reduced contribution rate is enjoyed by the employer-sponsor.

Part ii was a fairly straightforward funding methods question where candidates who were better prepared scored well. Many candidates seemed unfamiliar with the equivalence of the actuarial liability under the AAM and PUM.

Part iii was similarly bookwork. Well-prepared candidates scored well but some candidates answered as if they were derisking an insurer’s annuity portfolio. Some candidates tried to sneak a third risk transfer option in by strategic use of bullets but only the first two suggestions were marked. Buy-ins, buy-outs, longevity swaps and longevity bonds were all accepted.

QUESTION 8

i.

Demographic Assumptions

- **Mortality Rates**
 - By at least age and sex
 - A clear understanding of withdrawal rates would be important to understand if the benefit obligation of Starlight is foregone if the person leaves the company before retirement.
 - Expected life expectancy of retirees influences the duration over which benefits are paid.
 - Also their spouses
- **Retirement Age**
 - Estimates of the average age at retirement affects the number of payment periods.
- **Benefit Uptake and Utilization**
 - Pre-retirement mortality influences the inception rate/take-up of this benefit
 - A clear understanding of withdrawal rates would be important to understand if the benefit obligation of Starlight is foregone if the person leaves the company before retirement.
 - There is only a benefit if the pensioner wants to be a member of a medical scheme so expected patterns in the use of medical benefits post-retirement.
 - If the medical scheme has multiple benefit options, will also need assumptions about the take-up rate of various options.
 - And subsequent movement between options.
- **Number of dependants**
 - Need assumption of % married
 - And gender of the spouse (usually have a % for same sex)
 - And age gap between the spouses

Financial Assumptions

- **Discount Rate**
 - A rate based on current market yields (e.g., high-quality corporate or government bonds) used to discount future benefit payments.
- **General Inflation**
 - Affects overall cost increases and the purchasing power of funds/expense loadings.
- **Healthcare Cost Inflation**
 - Specifically relevant for medical schemes, as rising healthcare costs will increase the contribution rate for the medical scheme
 - and hence subsidy's future cash outflows.

ii.

Data Collection and Cohort Identification

Assemble data on the current retired workforce and eligible dependants who receive the subsidy.

As well as data on the current active workforce and their eligible dependents (who are likely to receive the subsidy in the future).

Classify members by relevant characteristics such as age at retirement/ current age if already retired and benefit option chosen, as these will influence future cash flows.

Review past contribution records from the medical scheme to determine patterns in subsidy usage.

Evaluate trends in the number of retirees, mortality rates, and benefit uptake.

Forecasting Future Benefit Payments

Since the subsidy equals $x\%$ of the monthly gross contribution, forecast the monthly contribution levels based on historical data and expected trends.

May also want to discuss with the employer and the SICMS actuary

Incorporate assumptions on contribution inflation (i.e., the rate at which contributions are expected to rise) to estimate future payment amounts.

Apply decrement probabilities (derived from updated mortality assumptions) to project the number of individuals alive and eligible in each future period.

Estimate the timing and duration of benefit payments by modelling the longevity of the retiree cohort for single lives and the joint life distribution for married members.

For future retirees: factor in the probability that each eligible retiree will fully utilize the subsidy.

Projecting Future Cash Flows

For each future period (e.g., monthly or annually), calculate the expected subsidy payment as the product of the forecasted contribution level and the number of surviving, eligible beneficiaries.

Sum the expected payments across all cohorts to generate a comprehensive schedule of future cash outflows.

Discounting Future Cash Flows to Present Value

Use a discount rate based on current market yields on corporate or government bonds that match the currency and expected term of the obligation.

Discount each forecasted cash flow back to the valuation date.

Sum the present values of all future cash flows to determine the total current liability for the subsidy obligation.

Also model expenses considering the general expenses currently

And then applying a discount rate net of general inflation.

iii.

On Financial Assumptions:

- **Discount Rate Variability**
 - Economic volatility can lead to fluctuating market yields.
 - A lower market yield (or higher volatility) may require a higher discount rate, reducing the present value of the liability in the valuation, or vice versa.
- **Inflation Assumptions**
 - Rising healthcare costs necessitate an upward revision of the healthcare cost inflation rate.
 - This increases the forecasted future outflows, thereby raising the liability in the valuation
 - Provided the subsidy is below the upper limit.
- **Contribution Inflation**
 - If assumed increases in contributions lag behind actual rates, the estimated benefit payments may be overstated.
 - Which would subsequently lead to an understated liability.

On Valuation Method:

- **Uncertainty and Margin for Adverse Deviation**
 Economic volatility introduces greater uncertainty.
 Actuaries may incorporate a margin or use sensitivity analysis to capture potential adverse deviations increasing the liability.

iv.

Under the PAYG system, the subsidy payments are made when benefits are due. This means that Starlight Industries funds each payment in the period it arises without setting aside resources in advance.

With regular contributions, the company would make periodic contributions to a dedicated fund. Over time, these contributions accumulate and are invested to generate returns.

With PAYG: There is no accumulation of funds or backing assets. The employer does not generate any asset to offset the liability, resulting in a direct, ongoing impact on cash flow/Because payments are made as incurred, the company is fully exposed to the risk of rising healthcare costs and inflation. Any unexpected surge in costs directly impacts the cash flow immediately.

Any upward shifts in healthcare costs or contribution levels immediately affect the cash outflow and may cause liquidity concerns.

This method is very inflexible.

The lack of stability in contribution rates may make budgeting difficult.

With regular contributions, the calculations are done infrequently e.g. annually or triennially

Which means there is a smoother contribution rate

There may also be some flexibility involved where the company can put away more funds than necessary when these are available

And depending on the funding method chosen,

And whether this benefit is open or closed to new employees

The contribution rate could be very stable.

In terms of the company's balance sheet,
the liability is always going to be affected by volatility
but the effect is dampened if there is a corresponding asset

Generally speaking, regular contributions would make the company's balance sheet and revenue statement less vulnerable to short-term economic fluctuations.

The PAYG model avoids investment risk because there is no fund to manage, but this would be present in regular contribution;

There is also reduced opportunity cost in PAYG

and with regular contributions there may be a difficulty than any funds earmarked for the arrangement can not be redirected elsewhere even if the net liability is negative

Accounting standards may not even allow the recognition of a negative liability which is a potential disadvantage for regular contribution

But with PAYG, it also means the company forgoes potential benefits from investment returns, which would reduce the liability under regular contributions.

On the upside, sophisticated asset-liability management for regular contributions(e.g., investing in inflation-linked bonds) can help match the timing and magnitude of the expected outflows, partially hedging against rising healthcare costs.

But the cost of capital for Starlight Industries would need to be considered as an opportunity cost.

In a world of rising longevity, the PAYG approach is likely to give a lower outgo now which will rise exponentially

Examiner Comment: This question examined candidates' understanding of the implications of different funding strategies - specifically comparing a pay-as-you-go (PAYG) arrangement to regular contributions - for financing post-employment medical benefits.

Stronger candidates offered a well-structured comparison, highlighting key dimensions such as funding security, stability of contributions, investment return potential, liquidity risks, opportunity cost, and administrative complexity. Many also correctly acknowledged the accounting and balance sheet implications, including the volatility in PAYG versus the asset-backing possible under regular contributions.

Weaker responses tended to describe one method without comparison or listed generic pros and cons without contextualising them for an employer-sponsored healthcare arrangement. Some overlooked practical constraints such as the difficulty of transitioning from PAYG to a funded approach, or made assertions without actuarial reasoning.