EXAMINERS' REPORT

November 2024 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.

- Dread disease

- Serious illness

- Crisis cash

- Living assurance

ii.

Both have a benefit trigger involving a critical illness event as being defined in the policy

Which can include an operation or medical procedure as well as listed conditions

In a stand-alone product, the CI cover is the main or only benefit

Usually a survival period is enforced e.g. 28 days

meeting the benefit trigger and the survival of the 28-day survival period; (i.e. No benefit payable on death, or death within the survival period)

In an accelerated product, the CI cover is combined with life cover /Essentially a life insurance policy with a CI benefit, should a CI diagnosis occur; if not, will pay on eventual death (if Whole of life)

There is only one benefit – on the first of the CI diagnosis or death

In a stand-alone product, cover for the CI is provided essentially for the product term less the survival period and hence premiums may be structured to accommodate this.

iii.

- Stand-alone CI product exposed to greater reputational risk if claim is repudiated given death in survival period
    - No benefit will be paid which may be contrary to expectations created at sales stage or what policyholder understood at such time
- Anti-selection on standalone CI product likely to be higher
    - Cheaper than accelerated given probability of not being paid, hence incentive to take out if policyholders know about family history, or particularly concerned about CI risk
- Greater complexity in standalone CI product and greater care required for definitions (and validating diagnosis and severity thereof) compared to accelerated
    - Standalone means difference between claim or no-claim whereas accelerated only impacts timing (however, could be significant).
    - Also impacts customer understanding and clarity which could result in additional risk if misunderstood cover and conditions
- Accelerated products will build up greater reserves given 100% probability of payment if remain in force, hence greater investment risks associated with these products

Examiner comments: Part i was pure bookwork, but very few candidates knew the different CI product names and hence failed to score well. Part ii was well-answered for the most part if candidates knew what an "accelerated" CI benefit was. Part iii was not well-answered. Candidates tended to focus on the key risks (mortality and morbidity) as opposed to the [relative] key risks and contrasting them between the products.

QUESTION 2

i.

- Oak Life will offer individual cover to members who leave Airflight before retirement (withdrawals)
- The cover will be at standard rates i.e. no individual underwriting
- For the same benefits that they had when they were in the Airflight benefit arrangement
- The premium is unlikely to be at the same rate but it will be the standard rate for individual lives
- May require that the higher cover has been in place for a minimum period (e.g. 2 years) to manage anti-selection
- Sum assured on life insurance will be based on salary at exit (not based on salary after exiting Airflight)
- May be averaged over a period to reduced risk of anti-selection
- May have other criteria such as a maximum age of eligibility
- Life cover may be offered on a term basis to retirement age
- Underwriting is likely to be required for whole of life cover

[MAX 3]

ii.

- Oak Life will need to load the cost of the option into the price of the group life cover
- For the North American method…
  - Pricing will be based on data over a reasonable period (3-5 years) to understand take up of continuation cover
  - Will then need to have an estimate of the likely additional risk premium foregone due to the option
- Alternative is to assume all members take up the option and that ultimate rates apply (so difference is ultimate rate less select rate)
- This is known as the conventional method.
- PV of additional premium over the average term of the individual contract is the cost of cover
- This will be done for the life cover and disability cover
- Needs to be allocated over the average period of membership for members of the Airflight Pension Fund
- May need to base this on experience for the industry as unlikely to be adequate Airflight data
- Individual policy pricing will already include provision for expenses of issuing and managing the policy.

[MAX 4]

Examiner comment: For part (i), candidates seemed to miss that the question was about leaving Airflight not due to retirement. Some also did not acknowledge that there would be no underwriting and that the cover would continue on an individual basis. Candidates who scored well were able to show a clear understanding of these distinguishing points.
For part (ii), candidates who performed well in this question were able to discuss the two different option pricing approaches. Candidates who performed poorly provided answers that were generic pricing steps and did not apply to the specific situation given in the question.

QUESTION 3

i.

- Employee benefit packages can be used to:
  - Retain employees: employees remain at an employer to continue to access the benefits provided by their employer
  - Attract employees: as employee benefit packages are not the norm for law firms in Gaul Legality adding this to their employment proposition could differentiate them from other law firms
- Other legal firms may be introducing employee benefits and Legality may want to ensure it stays competitive.
- Legality may have grown to a size whereby offering employee benefits has become a viable option. Small employers may not be able to administer/finance an employee benefit arrangement.
- Legality's employees may have complained or petitioned for Legality to facilitate an employee benefit arrangement.
- There could have been a change in tax/other legislation which makes offering employee benefits more viable than previously.

[MAX 2]

ii.

	DC	DB
Risks	Investment risk lies with employees – their contributions to the fund and the investment performance of their contributions determines their pensionable income. Fund is likely to pay a lump sum instead of a pension. Member will need to take on the risk of outliving their income or Find a way to transfer the longevity risk through purchase of an annuity	Investment and longevity risk lies with the fund– an employee's pensionable income depends on their time in service at the employer as well as the promised level of pensionable income agreed to in the Fund rules. Salary inflation risk will also lie with the fund as higher than anticipated salary inflation results in bigger benefits, Whereas in a DC fund, this merely reduces the expected replacement ratio

		Legality, as the fund sponsor, would be expected to fund any shortfalls or deficits, And their contribution rate is likely to vary with experience (ie is unpredictable). Legality may not have the risk appetite to take on this level of responsibility for its employees.
Benefits	Employees may have greater freedom of choice with regard to their level of pension contributions and investment options. This is the most common form of pension fund arrangement and so is likely to meet the expectations of employees.	Employees like the certainty/predictability associated with this form of pension fund arrangement. Consequently, this pension fund format is an effective employee retention mechanism.

[MAX 3]

iii. Group CI policies are associated with the following characteristics:

- Comparatively lower premiums if purchased on a compulsory basis due to reduced anti-selection (Compulsory cover cheaper than voluntary)
    - Consequently, employees access a benefit at a cheaper premium than if they were to source the benefit on an individual basis (Group cover cheaper than individual cover)
- Evidence of Health/Free cover limits: employees do not need to be underwritten on an individual basis in order to be covered under the group policy (up to a pre-specified benefit level)
    - This reduces the administrative complexity of the offering for both the employer and its employees
- Group policies can be renegotiated periodically (usually annually) which enables Legality to reassess the efficacy of this benefit as time lapses.
- If Legality is very large, their group rate is likely to be based on their own experience. If they are better than average risks in their industry, they would benefit from lower premiums
- Group CI policies are very common in most markets and are relatively easy to understand and purchase.

[MAX 2]

iv. Key considerations include:

- What are the needs of their employees?
    - What health insurance products do employees already have in place in their personal capacities?
    - Considering age, gender and chronicity profile
- What are the reasonable expectations of their employees?
- Are the primary care benefits offered by the state of good quality?
    - And available within a reasonable timeframe/Easy to access?

    - Would employees want primary care included within their PMI benefits?
- What PMI products are available?
    - Do all PMI products include primary care benefits or are there top-up products?
    - What are the price points of these products?
    - What deductions off their pay are staff willing to tolerate to get employee benefits? and
    - What percentage of that would be taken up by PMI?
    - Can these products be purchased on a group basis?
- How will this benefit be funded?
    - Cost to company basis or in addition to total package?
    - If Legality wishes to subsidise the benefit, what is the extent of this subsidy?
    - Are there any tax incentives around PMI products – rebates?
        - This could indicate a preferred structure (employer-employee split)
        - As well as indicating the maximim PMI spend?
- Will Legality offer a broad array of PMI options for employees to choose from?
- What are other comparable employers offering their employees in terms of PMI benefits?

[MAX 6]

This question was fairly well answered. Successful candidates paid careful attention to the detail presented in each part. Less successful candidates failed to address the question parts from the perspective of the required stakeholder (the employer or the employee).

Part i was straight bookwork and was answered well. Part ii revealed that some students did not understand the key differences between DB and DC funds. Some students indicated that the employer would always contribute towards the employees' retirement provisions regardless of the arrangement type. Many students did not discuss the benefits of each fund type from the perspective of the employer.

Part iii was well answered. However, some students omitted to see that the advantages were from the employees' perspective and relating to group cover. Advantages general to any CI benefit (individual or group) were not given credit. Jointly, many students failed to mention that many of the advantages of group cover are contingent on compulsory membership or specific take-up rates.

Many candidates struggled to generate sufficient unique points for part iv. Repetition was a problem here as well as poor structure. Additionally, many students assumed Legality would be offering the PMI benefit themselves and so did not consider factors relating to outsourcing the benefit (which is the most probable eventuality).

QUESTION 4

i.

- Valuation requires assumption on future inflation
- Which is likely to link through to pension inflation.
- Which may be higher in future
- Or future inflation may remain equal to long term average if elevated inflation does not persist
- With appropriate adjustment for current environment
- Or may continue for a significant period of time
- Judgement will be needed on future path of inflation
- Especially considering the time horizons specific to this fund (ie a closed fund has a far shorter time horizon than an open fund).
- The effect of inflation on nominal and real returns should also be considered,
- Which may also influence the discount rate.
- Check assumptions are reasonable versus previous valuation
- If different needs to be justified
- With comment made in current valuation
- Could check volatility of inflation during similar events in the past to gauge possible path
- If inflation likely to stay high then inflation assumption adjusted upwards
- Otherwise expected liability value will be too low
- Increased margins may be appropriate to reflect increased level of uncertainty or volatility in inflation [or interest rates or asset prices]

[MAX 5]

ii.

- Pension liabilities experience encompasses both the pension payments during the year (A)
- And the actual liability value in the 2024 valuation relative to what would have been expected given the 2023 valuation data and assumptions (B)
- Overall impact depends on inflation levels before the shock (an increase from 20%-22% is less significant than an increase from 2%-4%)
- In both cases, much will depend on the valuation basis adopted in the 2023 valuation
- In terms of A, the effect depends on when the pension increases are given.
- If given before June 2023, then there is likely to be no impact.
- Otherwise, it is likely that actual increases are likely to be higher than those assumed (given it was unanticipated).
- In terms of B, this will be impacted by increases given over the last year.
- And this may be further impacted by a valuation basis as described in part i..
- If nominal returns are expected to be unchanged, and inflation increases and assumptions are changed accordingly the liability increases.
- But if real return assumptions remain constant, then the change to the liability will be a second order effect only.

- The overall effect is greater for a pension portfolio with a longer discounted mean term.
    - So the age profile of the pensioners is important.
- Higher inflation may result in an increase in expenses

[MAX 4]

iii.

- In principle, the investment strategy should aim to maximise return subject to an acceptable degree of risk
- Where risk can be defined in terms of the mismatch between assets and liabilities
- In terms of currency, nature, term and uncertainty.
- And the amount of risk that can be taken on depends on the level of surplus
- The sponsor covenant
- the risk aversion of the sponsor
- Trustees' risk appetite and budget

- The effects discussed above are likely to lower the funding level
- should encourage a more matched position.
- Depends on how current strategy is structured
- And extent of inflation matching (was this exact or approximate)
- And overall how matched the strategy was
- But if inflation assumption adjusted upwards and…Inflation protection in the current strategy is insufficient then…
- may need to increase inflation protection
- Pensioner Liability matching strategy likely invested bonds
- May need to increase inflation-linked bond exposure
- Corporate and government bonds can be considered
- Subject to acceptable credit ratings
- Might have exposure to other assets (separate to matching strategy)
- Then check exposure to real assets
- Increase if there is none or not enough
- Look for assets such as property, equities, infrastructure
- But bear in mind these are expected to be real assets over the long-term and do not provide the hedge inflation-linked bonds will
- If appropriate in terms of Fund's liquidity restrictions
- Level of adjustment to strategy will depend on
- … availability of inflation protection assets in the market
- … costs of those assets
- … whether other assets currently held can (and should) be sold to purchase inflation-linked assets

[MAX 8]

Examiner comment:

Part i was not very well answered. Candidates tended to discuss how the change in inflation affected the valuation results, liabilities or assets. This was not awarded marks as the question related to the process of setting assumptions.

In Part ii many candidates didn't comment sufficiently on the change in actual versus expected results, noting only how the change in inflation affected the current position of the fund.

Many candidates focused their answers on macro implications instead of on the process of setting assumptions and struggled to make enough succinct points to earn reasonable marks for parts i and ii.

Part iii was reasonably well answered by most candidates.

Overall candidates did not score well on this question due to parts i and ii being poorly answered.

QUESTION 5

(i)

Projection of benefit costs will require:

- Collection of data over a suitable period (5-10 years)
- General population projection
  - Current level and age structure
  - Expected fertility rates
  - Expected mortality rates
  - Expected net migration rates
- Then use this to model benefit recipient population/Need to assess the experience of eligible people qualifying per year of age
  - Calculated proportion qualifying per age as a % of general population
  - Consider the effect of the means test
  - As well as trends of qualifying people based on both frailty and the means test
  - Qualification rates may differ by factors such as region, gender, income level etc
  - Mortality rates for benefit recipients will need to be estimated
    - Possibly consistent with gen pop but adjusted upwards
    - Will require the profile of current and future claimants according to relevant risk factors
  - Can then project the number of claimants per year over the 30 year projection period
- Need to project the tax paying population
  - Consider the proportion working per year of age
  - Average income per year of age
  - And hence average tax payment
  - Needs to allow for appropriate salary inflation
  - And any trends in employment

(ii)

- Project benefit amount by multiplying claimants per year by cash benefit amount
- May need to be adjusted by trends in eligibility based on ADLs
- Escalated by appropriate inflation projection per period
- Noting that no guarantee on inflation of the benefit
- Tax revenue projected with reference to taxpaying population
- Tax revenue may also include other sources such as VAT and company tax
- Need to project these on appropriate basis e.g. inflationary
- Projection of benefit cost as proportion of tax revenue
- For each year calculate projected benefit cost as percentage of tax revenue
- Trends are more important than PV

[no marks for discounting back to present]

(ii)

Benefits of tax deduction:

- A tax deduction will encourage take up of LTC policies
- More people will provide for themselves and not be eligible for state benefits due to means test
- May be popular with taxpayers

Benefits of increasing the age of eligibility

- Fewer claimants will reduce the cost of the benefit
- Also benefits are likely to be paid for shorter

Risks of the tax deduction:

- Tax foregone may be greater than the benefit gained if there are a lot of policies in the market
- On a prefunded product, you may give a tax deduction to someone who would never become frail enough to claim
- Can lead to misselling of policies
- Or other products which don't meet the same need being dressed up as LTCI products to get the benefit

Risks of increasing age of eligibility

- Will be politically unpopular, particularly with those near aged 60 or between 60 and 70
- People who need the benefit will not have access and may suffer/die

(iii)

- It may make logical sense to also use ADL for assessment
    - Can use the same definition as the state benefit
    - Or a more lenient definition
- The design will depend on whether the means-tests includes the LTCI benefit or not Or if the LTCI benefit can be structured in a way that the benefit does not count towards the means test

With the change

- There will be pressure to increase the benefit amount for claimants below the age of 70 for whom there is no state benefit.
- This will increase the cost of cover overall
- The tax deduction will make the cover more attractive
- Will be easier to market and sell the cover
- May improve anti-selection exposure if there is a broader market base
- Also fixed costs may be spread over a broader base
- Making premiums more competitive

Examiner comment: This question was reasonably well answered. Candidates performed well on part (i) where they took a structured approach describing the data sources, how these would be organised and then the projections determined. Part (ii) focussed on the amounts and a surprising number of candidates referred to indemnity benefits despite the question clearly referring to a cash amount. The sections on the risks and benefits of the changes as well as the impact on ABC cover were handled well although a number of candidates did not provide enough points to get all the marks.

QUESTION 6

i

Both:

- Are reserves held over and above the actuarial liability
- That are usually subject to some sort of regulatory oversight
- E.g. Method of calculation must be approved, min levels, max levels
- They are effectively margins for prudence

But

- A solvency reserve is a margin against general adverse experience
- Whereas other contingency reserves are held for a particular purpose

ii.

- E.g. Data error reserve
  - Benefits paid out based on incorrect data/When the actuary does not have confidence in the actuarial liability value due to poor quality data
- Cost stabilization reserve
  - To allow for smoothing of the contribution rate over time
- Strategic expenditure reserve
  - To fund a capital project and spread the cost over a number of years
- Processing error reserve
  - To cover asset and liability mismatching through administrative error/maladministration of tax etc
- Risk reserve
  - Held to cover the cost of any self-insured risk benefits
- Expense reserve:
  - A reserve that tracks the surplus or deficit arising from the mismatch between expenses and expense contributions collected.

[MAX 3]

iii.

- The data could have been pulled on different dates meaning one set of data could be more complete and correct than the other.
- The regulation and professional guidance around these two valuation types could be different
- Meaning a difference in actuarial funding method
- And/or basis
- In particular, one would expect the statutory result to have more margins for prudence than the accounting valuation.
- The accounting standards applying may be different

[MAX 2]

iv.

- The AAM targets a stable StCR over the remaining life of the fund,
- Which is appropriate because it is closed to new members and hence the maximum run-off time is understood.
- The AAStCR is defined as present value of all benefits that will accrue to current active members after the valuation date, by reference to service after that date and projected final earnings, divided by
- present value of total projected earnings for all current active members throughout their expected future membership.
- The PUStCR has a very similar definition but uses a shorter-term/control period, more appropriate for a going concern.
- The actuarial liabilities under both methods are identical.
- But the AAStCR is always higher than the PUStCR when calculated for the same benefits.
- And regulation requires the StCR and AL to be recalculated regularly so the single stable contribution rate that the AAM aims to deliver in theory does not arise in practice.
- But results in a more rapid pace of funding than the PUM.
- While this enhances benefit security for members
- Particularly if the sponsor covenant is weak
- It increases the opportunity cost for the sponsor
- Which in general may encourage them to discontinue the scheme
- Or close to new members in our case
- Regulation may favour one method over the other in certain cases and would need to be considered
- E.g. open vs closed schemes
- As well as any professional guidance.
- Given that we are not told about the effective dates, it is possible that either regulation or professional guidance has changed which could affect one or both funds.

[MAX 7]

Examiner comment:

The first two parts of the question related to contingency and solvency reserves. Some candidates answered these parts for a health insurer despite the context given. The difference between a solvency reserve and the solvency capital requirement was not well understood and page 1165 of the notes should be revised. Many candidates could identify a contingency reserve appropriate for a DC fund, but not a DB fund. Candidates are reminded to please read questions carefully and answer the questions asked.

There were many marks available for part iii and most people did well. In some cases, however, some candidates simply belaboured the point that the bases could have been different. The command verb 'outline' in this question was significant. Candidates were expected to generate breadth in their answers and not depth.

For part iv, the question was intended to be clearer that the context for both funds was the statutory actuarial valuation, however alternative interpretations were catered for in the marking.
A number of candidates seemed unfamiliar with the funding methods which limited their ability to provide any sensible answer. For those more familiar with the funding methods, there was a belief that under the AAM the contribution rate would only be calculated once. For both accounting disclosures and statutory purposes this is unlikely to be acceptable. So, although the AAStCR is theoretically only calculated once at the outset, it doesn't work that way in practice. The apparent anomaly set out on page 1247 of the notes is important!
A number of other candidates inferred that a closed fund meant a pension-only fund. A fund can be closed for decades before this situation is reached so closed does not infer no active members. A further clue is that the actuarial funding methods apply only to active members. If the neighbour's fund was pensioner-only it would not use any of the methods. Others assumed an open fund must be "growing". In terms of membership, this may not be true. Many candidates wrote about as much for part iv as they did for part iii despite the mark allocation difference. This suggests poor planning or time management. That said, there were some excellent answers for this part of the question.

QUESTION 7

i.

Average claims ratio = (57.2%+58.1%+57.8%)/3 = 57.7%

Total premium for April 2023 = (300,000 x 500) + (620,000 x 385) = 388.7 million

Total expected claims for April 2023 = 57.7% x 388.7 million = 224.3 million

ii.

Use Dev 0 cumulative factor as given the Dev 0 paid claims

Therefore, the expected ultimate is 103.6 million x 1.49 = 154.7 million

The expected claims estimate using the development factors is 16.1 million higher than if using the claims ratio approach.

Need to check if historic processing and payment trends have changed and hence reserve overstated.

iii.

- Seasonality refers to the seasonal variation in claims over the year
- Some months will experience higher claims rates or lower claims rates than the average month
- For example, winter months are prone to higher claims as more people tend to fall ill with colds & flus
- Months with school and other holidays may have lower claims rates as more people tend to be away and so fewer procedures occur during those periods
- Certain benefits are impacted by some seasonal trends and not by others
- For example, PMI benefits may not provide cover for colds and flus and thus winter months have less of an impact on the insurer's seasonal trend
- Will need to work out what seasonal trends impact the PMI insurer's benefits
- Will then need to work out what seasonal adjustment to apply to the estimated claims
- If this month is a higher seasonal month then an upward adjustment is needed
- If this month is a lower seasonal month then a downward adjustment is needed
- If this month is an average month then no adjustment would be needed
- Historical trends by month could be used to determine the average cost per month and to see how this changes by month within a year
- This can be used to determine the scaling factor needed

iv.

- Auto-approval will mean claims are processed and paid automatically/instantly after being submitted to the insurer
- Auto-approval thus means that claims are processed faster and may also be settled faster
- This will mean shorter run-off patterns for these types of claims
- Will need to understand what proportion of total claims will be impacted as if it is only a small portion then there may be little to no change in overall run-off pattern for claims
- If impacts a large portion of the claims and thus does impact the overall run-off pattern then IBNR factors from basic chainladder or paid chainladder techniques may be invalidated for future trends
- Applying recent development patterns to these payment amounts (once the system has been introduced) will lead to reserves being higher than required to pay claims relating to this period.
- Adjustments would need to be made to historic run-off trends
- To allow for the change in claim payment pattern, the reserves need to be lower than what is implied by historic trends
- This could be done making adjustments to the development patterns to reflect the fact that claims are being paid faster
- This will cause volatility in the claims payment development patterns which will mean the reserve calculations should be monitored and updated over the next few months.
- It is important to understand whether these new payment patterns will become the norm.
- When the payment patterns have stabilised, the observed development patterns can be used without further specific adjustments.

- May need to rely on other reserving approaches such as incurred chainladder

[MAX 3]

Examiner comment: Overall this question was reasonably answered. For part (i) most candidates scored well, those who did not either used the wrong period to calculate the average or did not use a straight average method. Candidates needed to show all their calculation steps to be given full credit. Part (ii) was very poorly answered as many candidates failed to recognise they were given cumulative development factors and not incremental. Many candidates also failed to comment on their answers. To score well in part (iii) candidates needed to provide a sufficient number of distinct and well explained points. Very few candidates wrote enough points for the mark allocation. Candidates also failed to distinguish that seasonality may impact both the initial incurred amount as well as the processing and payment patterns. For part (iv), most candidates discussed how claims may be settled sooner but many failed to discuss the impact of this change on the existing run-off patterns as well as consider whether all claim types would be impacted.

QUESTION 8

i.

Different benefit categories

- E.g., in-hospital, out-of-hospital, day-to-day, and chronic benefits
- Recognising the nuances within each category allows for a more nuanced analysis of PMI products, enabling actuaries and financial advisors to tailor recommendations based on the specific healthcare needs of clients.

Claim limits for each benefit category

- Private Medical Insurance (PMI) involves defining claim limits and sub-limits to determine coverage levels/Claim limits set maximum coverage for different benefits, such as in-hospital stays, outpatient services, daily expenses, and chronic conditions.
- Sub-limits provide more specific limits within these categories, detailing coverage for particular services.
- Actuaries and financial advisors consider these limits when making recommendations to policyholders, helping them understand the financial aspects of their PMI coverage.

Differences in limits and thresholds

- e.g., a cancer limit of R 300 000 vs threshold of R 300 000 (above which 80% of claims still covered)

Deductibles and co-payments applicable to certain claims

- Deductibles can vary in terms of amount and application (annual or per claim), impacting the out-of-pocket expenses for policyholders.
- Similarly, co-payment structures may differ, influencing the cost-sharing mechanism between the insurer and the policyholder.***Reimbursement rates for in-hospital claims***/
- Reimbursement rates for in-hospital claims hold significant importance in determining the overall benefit structure.
- These rates, expressed as a percentage of covered expenses, are not fixed but rather vary based on several factors that include
- the severity of medical procedures, [1/4]
- the tier and network of hospitals,

- and the specific type of PMI policy [1/4].
- To ensure comprehensive coverage, anticipate financial implications for policyholders, and evaluate the competitiveness of various PMI products in the market, actuaries and financial advisors must meticulously analyse these rates.

Provider network restrictions

- PMI benefit designs often differ concerning the network of healthcare providers.
- Some plans may have exclusive networks, limiting access to specific hospitals or physicians, while others offer a more extensive network, allowing for a broader choice of healthcare providers.

Exclusions and Limitations

- PMI products may vary in terms of exclusions and limitations.
- These are specific conditions, treatments, or services not covered by the insurance.
- Differences in exclusions and limitations can significantly impact the perceived value and suitability of a PMI product for a particular individual or employer group.

Waiting Periods

- Waiting periods before certain benefits become applicable can differ between PMI products.
- For instance, some plans may impose waiting periods for pre-existing conditions or specific treatments.

[max 4]

ii.

- If a PMI benefit comparison makes use of an analytical model to measure relative benefit richness, then the model should incorporate a satisfactory representation of the PMI benefit structures. ✓
- The model should therefore allow for all the aspects of the benefit structures - as outlined in part (i) – appropriately. ✓

The following are possible methodologies that may be adopted in the comparison of benefit richness:

- A generalised linear model employing key benefit design features as predictor variables, with richness as the response variable. ✓
- A stochastic simulation of claims combined with the application of benefit limits to determine the richness under a given benefit structure. ✓
- A detailed line-by-line comparison of benefit structures across PMI products to identify gaps in benefit offerings. ✓
- Develop a distribution of claims amounts by benefit limit. ✓
- Modelling the impact of each benefit limit on claimed invoice amounts. ✓

- The modelling approach should be chosen with the available data in mind and whether this enables the actuary to build the desired model. ✓
  The actuary should assess the suitability of any empirical data used in the model by considering the source, accuracy, and credibility thereof. ✓
- Where the data has material inadequacies, these should be fully documented and disclosed to the client if considered appropriate, else not presented. ✓

- A consistent measure of richness should be applied across different PMI products to enable a like-for-like comparison. /Similarly, a consistent calculation method should be applied across PMI products. ✓
- If richness is calculated analytically, sensitivity tests should be conducted to demonstrate the reasonability of response in outputs to a change in the model parameters. ✓
- Where richness is calculated stochastically, a sufficient number of simulations should be conducted to demonstrate stability in the statistical distribution of the results. ✓
- In addition, the actuary would perform sensitivity testing e.g. on parameterisation on the distribution. ✓
- An appropriate allowance should be made for PMI products that provide treatment through Designated Service Providers (DSPs) including consideration for the extent of such networks. ✓
    - The size and spread of a provider network put in place for members to gain full cover, and how this meets the needs of the client's location. ✓
    - The size of any co-payment applying if the covered life does not use the DSP is also a consideration✓
- The actuary should apply judgement in deciding whether all benefit structures should be applied in the richness calculation or only the significant ones. ✓
- This should be guided by the proportion of claims in the experience data that belong to each benefit category to which such limits apply. ✓
- The results of the model should be assessed for reasonability, through a comparison of the outputs with actual PMI product benefit structures. ✓
- Where the model is stochastic in nature, the consistency of results should be verified through the production of enough simulations to demonstrate stability in the statistical distribution of outputs. ✓

[max 4]

Examiner comment:

Most candidates performed well on part (i) of Question 8. However, a common reason for not achieving full marks (which was highly attainable for this question) was the oversight by many candidates in addressing the second part, which instructed candidates to "explain how they may differ."

In part (ii) of Question 8, many candidates provided generic responses on the characteristics of a good model derived from the bookwork, without attempting to apply these concepts to the specific context of the question.