COURSE COVERAGE

Question	Unit	Syllabus Key Performance Objective(s)	Syllabus Learning Objective(s)	Page Reference in Course Notes/Textbook	SJ Marks	CJ Marks	Total Marks
1 a) i)	3	3.6	3.6.2	Ch 12: pg 50-51	6	0	6
1 a) ii)	2	2.4	2.4.3	Ch 11: pg 42-44	9	0	9
1 b)	1, 2	1.1, 2,4	1.1.3, 2.4.4	Ch 7: pg 28,Ch 11: pg 44	1	9	10
1 c)	4	4.8	4.8.2-4.8.5	Ch 13: pg 55-60	1	6	7
Total					**17**	**15**	**32**

Question	Unit	Syllabus Key Performance Objective(s)	Syllabus Learning Objective(s)	Page Reference in Course Notes/Textbook	SJ Marks	CJ Marks	Total Marks
2 a)	1	1.1	1.1.3	Ch 7	1	0	1
2 b)	1	1.1	1.1.3	Ch 7	2	0	2
2 c)	1, 2	1.1, 2.4	1.1.3, 2.4.3	Ch 7, 11	2	3	5
2 d)	1, 2	1.1, 2.4	1.1.3, 2.4.3	Ch 7, 11	4	2	6
2 e)	1, 2	1.1, 2.4	1.1.3, 2.4.3	Ch 7, 11	2	2	4
2 f)	1, 2	1.1, 2.4	1.1.3, 2.4.3	Ch 7, 11	5	3	8
2 g)	4	4.8	4.8.1	Ch 13	0	3	3
Total					**16**	**13**	**29**

Question	Unit	Syllabus Key Performance Objective(s)	Syllabus Learning Objective(s)	Page Reference in Course Notes/Textbook	SJ Marks	CJ Marks	Total Marks
3 a) i)	3	3.5	3.5.1	Ch25, 25.5	5	0	5
3 a) ii)	3	3.5	3.5.1	Ch25, 25.2	2	0	2
3 b) i)	3	3.5	3.5.2/3.5.3	Ch25, 25.3	7	0	7
3 b) ii)	1	1.1	1.1.1/1.1.3	Ch21, 21.5.6	3	0	3
3 c)	1	1.1	1.1.1/1.1.3	Ch21, 21.5.3	4	0	4
3 d)	1	1.1	1.1.1/1.1.3	Ch21, 21.5.4	2	6	8
Total					**23**	**6**	**29**

MARKING GUIDE: QUESTION 1 (32 Marks)

a) i)

Profit

Year	0	1	2	3	4	5	6	7	8	9	10
Premium (Net)		9,440,000	20,768,000	34,928,000	53,808,000	77,408,000	105,728,000	134,048,000	162,368,000	190,688,000	219,008,000
Claims (Net)		6,000,000	13,200,000	22,200,000	34,200,000	49,200,000	67,200,000	85,200,000	103,200,000	121,200,000	139,200,000
Product Expenses		2,000,000	4,400,000	7,400,000	11,400,000	16,400,000	22,400,000	28,400,000	34,400,000	40,400,000	46,400,000
Project Costs		5,000,000	5,000,000	-	-	-	-	-	-	-	-
Investment Earnings		1,494,040	1,505,595	1,789,787	2,112,148	2,555,936	3,145,301	3,875,565	4,750,771	5,775,080	6,952,770
Profit before tax		(2,065,960)	(326,405)	7,117,787	10,320,148	14,363,936	19,273,301	24,323,565	29,518,771	34,863,080	40,360,770
Tax		(619,788)	(97,922)	2,135,336	3,096,044	4,309,181	5,781,990	7,297,069	8,855,631	10,458,924	12,108,231
Net Profit After Tax		(1,446,172)	(228,484)	4,982,451	7,224,103	10,054,755	13,491,311	17,026,495	20,663,140	24,404,156	28,252,539
Profit Margin		-15.3%	-1.1%	14.3%	13.4%	13.0%	12.8%	12.7%	12.7%	12.8%	12.9%

Balance Sheet

Year	0	1	2	3	4	5	6	7	8	9	10
Total Assets	40,000,000	38,553,828	38,325,344	43,307,795	50,531,899	60,586,654	74,077,964	91,104,460	111,767,599	136,171,755	164,424,294
Total Liabilities	-	-	-	-	-	-	-	-	-	-	-
Net Assets	40,000,000	38,553,828	38,325,344	43,307,795	50,531,899	60,586,654	74,077,964	91,104,460	111,767,599	136,171,755	164,424,294

Marking Guide

- **1 Mark for deriving the correct premium income**
- **0.5 Mark for determining the correct claims amount**
- **0.5 Mark for determining the correct (product) expense margin**
- **0.5 Mark for determining the correct project expenses**
- **0.5 Mark for determining the correct investment income**
- **0.5 Mark for determining the correct tax**
- **0.5 Mark for determining the correct profit (after tax)**
- **1 Marks for determining the correct assets**
- **1 Marks for determining the correct liabilities**
- **0.5 Marks for determining the correct net assets**

Up to 6 marks. Full marks should not be awarded if all of the individual components are correct but the profit after tax is incorrect

a) ii)

Year	0	1	2	3	4	5	6	7	8	9	10
Capital Base	40,000,000	38,553,828	38,325,344	43,307,795	50,531,899	60,586,654	74,077,964	91,104,460	111,767,599	136,171,755	164,424,294
PCA	13,102,405	14,925,447	13,717,797	18,057,145	23,910,654	31,301,477	39,265,758	47,771,226	56,843,867	66,532,388	71,351,487
Target Surplus	6,551,203	7,462,723	6,858,899	9,028,573	11,955,327	15,650,739	19,632,879	23,885,613	28,421,933	33,266,194	35,675,743
Excess Assets	20,346,392	16,165,658	17,748,649	16,222,078	14,665,917	13,634,438	15,179,327	19,447,621	26,501,799	36,373,174	57,397,063

Marking Guide

- **1 Mark for determining the correct capital base**
- **6 Marks for determining the correct PCA**
  - **3 for Insurance Risk Charge**
  - **0.5 For Asset Risk Charge**
  - **0.5 for Aggregation Benefit**
  - **0.5 for Operational Risk Charge**
  - **1 for Combined Scenario Adjustment**
  - **0.5 for PCA**
- **1 Mark for determining the correct Target Surplus**
- **1 Mark for determining the correct Excess Assets**

Up to 9 marks

b) i)

Dear CEO,

This memo sets out my responses to the questions you have raised following the recent Board meeting.

Assumptions

In order for me to get comfortable with the assumptions used, I would perform the following work:

- Sales
  - Compare the projected sales with recent historical experience in the segments of the market FinServ wish to enter;
  - Review reports from research houses which illustrate the growth prospects for FinServ's target market and compare them to FinServ's projected numbers; and
  - Hold discussions with the management of FinServ about their plans supplemented by discussions with internal colleagues
- Loss Ratios
  - Compare the loss ratios assumed with observed experience which can be obtained from the APRA statistics
  - Compare the loss ratios assumed against loss ratios from our other clients
  - Understand differences in FinServ's product range compared to the industry
  - Hold discussions with FinServ's management to understand their underwriting, product design and claims management supplemented by discussions with internal colleagues
- Stress Margins
  - Compare the stress margins assumed with the results from the latest stress margins survey which shows results from across the industry;
  - Hold discussions with FinServ management to understand their Experience Investigation, reporting and risk management processes along with their IT capability
  - Perform a bottom up determination of the stress margins based on this information and the Actuaries Institute Information Note

See part iv) for marking allocation

b) ii)

Target Surplus

- Advantages
  - It is easy to understand as it is directly proportional to the regulatory capital calculation
  - It is easy to compute
- Disadvantages
  - It is difficult to form a link between the target surplus held and the risk appetite of FinServ

- It relies heavily on the regulatory capital calculation and therefore does not consider the full range of risks FinServ is exposed to.

- Alternative
  - It is common practice to set a target surplus amount that is based on the risk appetite of the company. This may be expressed as a probability of not breaching the PCA over a one year timeframe after a stressed event. For example, FinServ will hold target surplus such that, after a 1 50 year event, FinServ can meet its PCA at the end of the year. The stressed event may consider the full range of risks that FinServ is exposed to.

See part iv) for marking allocation

b) iii)

Suitability of Model for Policy Liability Valuation

The projection model is intended to provide a high-level view of the projected financials of FinServ. It should not be used for determining the policy liabilities as:

- It does not have the capability to determine claim reserves for claims that have been incurred. The model makes a simplifying assumption that all claims are fully settled in the year that they are incurred. Based on historical experience, this assumption is unlikely to eventuate in practice;
- Even if the assumption did eventuate, there would be timing issues in that claims could be incurred in the month prior to the valuation and still not settled. Reserves would need to be held for these claims
- The model is a high-level model and is not at the granularity required to measure liabilities. Liabilities are typically measured at a benefit (death, TPD and IP level). By extension, a LAT would not be able to be performed as the model does not project separately for each RPG.

See part iv) for marking allocation

b) iv)

Shortcomings of approach

The current approach to modelling the claims cost is to assume that all claims are settled in the year they are incurred. In practice, there is a delay between the claim event and the notification date (and ultimately payment date). These delays mean that part of the claims cost represents reserves for future notifications and payments. As the business will be 60% reinsured, these reserves have a reinsurance component which is held as an asset on the Balance Sheet.

The capital standards have limits on the amount of exposure an entity is allowed count for capital purposes – this includes exposures to reinsurers. If a full projection was performed, FinServ may breach these limits which may mean that future capital injections are required.

Please let me know if you have any questions.

Regards,

Consulting Actuary

Marking Guide

- **Assumptions**
  - **1 Mark for any valid point on sales**
  - **1 Mark for any valid point on loss ratios**
  - **1 Mark for any valid point on stress margins**
- **Target Capital**
  - **1 Mark for any valid advantage**
  - **1 Mark for any valid disadvantage**
  - **1 Mark for any valid alternative**
- **Suitability of model**
  - **1 mark for each valid mark subject to a maximum of 2 marks**
- **Key Risk Identification**
  - **1 mark for identifying reinsurance asset not identified under current approach or any other valid point (e.g. lapses)**
  - **1 mark for valid implication for FinServ**
- **1 Mark for appropriate language and format**

Up to 10 Marks

c) i)

Dear ET,

This memo sets out my responses to your recent requests concerning valuing the business using Embedded Value techniques.

Performing the Valuation

- Based on the projection model produced, the valuation of the business could be derived as follows:
  - The adjusted net worth can be calculated using the existing projection model, which provides a view of the available assets available as at time 10, once future capital requirements are allowed for.
  - For the business in force at the end of year 10:
    - Project forward the expected profits on this business using assumptions on future claims, expenses, and the probability of renewal and future capital requirements of the business. These assumptions may be different to the current ones in the Business Plan
    - Discount these Cashflows back to the valuation date (after 10 years)
  - The valuation would require assumptions on future claims, expenses and the probability of renewal. In addition, given the uncertainty in the timing and the amount of the Cashflows, they are typically discounted using a risk discount rate (risk-free rate plus a margin to compensate the shareholder for taking on the risk). The selection of the discount rate is subject to judgement
  - In addition, dividends to Australian shareholders are typically franked meaning that tax has already been paid on the profits. Hence, the value to shareholders should also include a value in respect of this tax. An assumed proportion of the tax to include should also form part of the value. However, consideration should be given

to whether the shareholder is an Australian based one or overseas (which may not be able to get the benefit of the franking credits). In this case, the company may be two-thirds owned by overseas shareholders

- For new business after year 10;
  - It is common practice to perform a similar calculation to the one above on one year's worth of sales and apply a multiple to this value. This is subject to judgement.
- The sum of these two components will give you the Appraisal Value of the company

See part iii) for marking allocation

c) ii)

Other Valuation Measures

- Another approach is to apply a multiple to a year's earnings to arrive at a value. However, this is subjective and is not common practice in the market.

See part iii) for marking allocation

c) iii)

Rationale for using Embedded Value

The use of Embedded Value techniques is the preferred approach as:

- It is a more common approach. In particular, practice is evolved in areas where subjectivity is involved
- As it is a more common approach, it is easier to compare the result with other similar companies

Please let me know if you have any further questions.

Regards,
Consulting Actuary

Marking Guide

2 marks maximum for describing the AV
- **0.5 Mark for describing the ANW calculation**
- **0.5 Mark for describing the VIF calculation**
- **0.5 Mark for describing the VNB calculation**
- **0.5 mark franking credits/ sum of the above**

2 Marks (maximum) for describing the additional information required
- **Assumptions for claims, lapses and expenses required after year 10**
- **Risk discount rate**
- **Multiplier to apply to VNB**

- **Franking credits proportion**

1 Mark for describing an alternative approach

2 Marks (maximum) for valid reasons advocating use of EV techniques
- **1 Mark for each valid reason**

Up to 7 Marks

END OF MARKING GUIDE QUESTION 1

MARKING GUIDE: QUESTION 2 (29 Marks)

a) Policy Liability = BEL Lump sum + PVPMs Lump sum + BEL DII

= -1bn + 0.5bn -0.2bn + 0.5bn = -0.2bn

Marking Guide

- **0.5 marks for correct formula showing policy liability as the sum of BEL and PVPMs**
- **0.5 marks for correct answer**

Up to 1 mark

b) Policy Liability = BEL Lump Sum net of RI + PVPMs Lump Sum net of RI + BEL DII

= (-1bn +1bn) + (0.5bn + 0.8bn-1bn) + (-0.2bn+0.5bn) = 0.6bn

The previous PV profit margins for the lump sum book of 0.5bn is effectively replaced with a new PV profit margins of 0.3bn, given that 0.2bn of PVPMs has effectively been transferred to the reinsurer in exchange for the up-front cash commission.

Marking Guide

- **1 mark for correctly identifying the need to calculate the reinsured profit margin as the difference between the reinsured BEL and the commission received**
- **1 mark for successfully incorporating remaining components of calculation and getting to correct answer**

Up to 2 marks

c) **i)** The commission itself does not result in $800m of profit at the time of the transaction because there is an offsetting increase to policy liabilities. The present value of profit margins is expected to fall by $200m which means that the profit in all years starting from 2019 is expected to reduce.

Marking Guide

- **1 marks for stating no profit at inception**
- **1 mark for stating profit in 2019 will reduce because present value of profit margins has reduced**

Up to 2 Marks

c) **ii)** The capital base is expected to increase due to the $800m of commission from the reinsurer. The commission is received as cash which forms part of the capital base, whereas the termination value is unchanged following the transaction.

Depending on the tax situation, including the presence of Deferred Tax Assets/Deferred Tax Liabilities, the increase in capital base may be less than $800m.

There will be no increase for the IRC In relation to the claims reserves, as the reinsurance contract only covers claims incurred on or after 1 January 2019. There may be no change to the IRC as the IRC before and after reinsurance may be zero (if the product is sufficiently profitable). Otherwise, the IRC would be expected to decrease, if the IRC prior to insurance was greater than zero.

Marking Guide

- **1 mark for stating an increase to the capital base due to the commission being received.**
- **1 mark for an explanation with reference to the commission adding to the capital base but no corresponding deduction**
- **0.5 marks for comment on potential impact of tax situation, noting that this may decrease the increase in capital base.**
- **0.5 marks for noting that the IRC on claims reserves will not change.**
- **1 mark for comment that the change to the IRC will depend on the levels of profit for the Lump Sum business.**

Up to 3 Marks

d) Advantages of Offer 1

- Dividend: Offer 1 should enable a large dividend to be paid to AUSLIFE's shareholders
- Capital usage: Offer 1 may reduce the capital requirements of AUSLIFE freeing up capital for other uses.

Disadvantages of Offer 1

- Risk of future reinsurance premium increase: Offer 1 gives the reinsurer the opportunity to increase the reinsurance premium rates in the case of worsening claims experience, and furthermore there is not a clear mechanism for the size of any increase. This feature of the treaty will pose an ongoing risk to profitability and potential difficult discussions with the reinsurer.
- Not dealing with disability income issues: Offer 1 is essentially cashing in on the successful and stable lump sum business of AUSLIFE however does not deal with the main underlying risk to profit stability which is the DII book. Furthermore, AUSLIFE will have reduced profits from the lump sum book to help offset any further loss recognition on DII.
- Offer 1 is expected to require APRA approval under LPS 230 due to the commission payment, which is likely to add to the implementation time

Advantages of Offer 2

- Capital usage: Offer 1 will reduce capital requirements of AUSLIFE by reducing the disabled lives reserve.

Disadvantages of Offer 2

- Asset transfer: depending on the make-up of the assets transferred, this may cause an asset-liability mismatch and increase the volatility of profit.

Marking Guide

- **1.5 marks for each of the above points**
- **1.5 marks for any other reasonable points**

If the candidate has provided an advantage / disadvantage for Offer 1 that is the same as an advantage / disadvantage for Offer 2 or vice versa, then only award marks for one of the points.

Up to 6 Marks

e) The following terms not mentioned in the table would also be very important to define in the treaty:

- Collateral: Under Offer 2 AUSLIFE will have a large counterparty exposure to OZRE in respect of the reinsured disability income claims. As such it will be very important for AUSLIFE to ensure that it receives appropriate collateral from OZRE to ensure that it is not overly exposed to a default of OZRE and furthermore that there is not a large capital requirement in respect of concentration risk.

- Termination rights: It is important for AUSLIFE to ensure that there are no termination provisions which might allow OZRE to release itself from its obligation to pay 80% of all disability income payments of the reinsured business in the future.

Marking Guide

- **2 marks for each of the above points**
- **2 marks for any other reasonable points (e.g. payment schedules, recapture)**

Markers should only consider the first two bullet points mentioned by the candidate.

Up to 4 marks.

f) **i)** Advantages of a transfer of the liabilities include:

- Transfer means full legal and economic responsibilities would move to the transferee and a clean separation from the business.

- It also means no need for future work to administer the reinsurance or discussions with OZRE about treaty interpretations etc.

- It may increase the number of potential buyers beyond those willing to enter a reinsurance arrangement, and potentially help achieve a higher price

Disadvantages of a transfer of the liabilities include:

- The sale price net of all transition costs may be lower than embedded value of the liabilities, reducing shareholder value.

- Loss of scale in distribution channels, with less premiums to spread fixed costs over

- Ceding market share and the potential strategic benefit of the business line

Marking Guide

- **1 mark for a valid advantage of a transfer of the liabilities. Note minimizing counterparty risk not a relevant answer here as AUSLIFE does not have a reinsurance asset with OZRE under Offer 1**
- **1 mark for a valid disadvantage of a transfer of the liabilities.**
- **1 mark for an additional valid advantage or disadvantage of a transfer of the liabilities.**

Up to 3 marks.

f) **ii)** The transfer requires a court process under Part 9 of the Life Insurance Act. Under the process there will be various parties (e.g. Appointed Actuaries, independent actuaries, regulator, and ultimately the judge) which need to be comfortable that no policyholder from either company is materially worse off as a result of the transaction. The entire process would be expected to take around 6 to 12 months to complete from the time of signing.

Marking Guide

- **1 mark for reference to court process under Part 9 of Life Act**
- **1 mark for identifying parties involved or calculations required as part of the transfer**
- **1 mark for noting main focus of the process is to ensure no policyholder from either company is materially worse off**
- **1 mark for a noting a long timeframe**

Up to 3 marks

f) **iii)** In the case of a transfer of the lump sum business, the challenge for the Part 9 process is likely to be to demonstrate that the disability income policyholders of AUSLIFE are not worse off following the transfer. This is because currently the performance of the lump sum business provides support (effectively a cross-subsidy) to ensure the obligations to the disability income policyholders are met.

Marking Guide

- **2 mark for noting potential issue with regards to remaining DII policyholders with reasonable explanation**
- **2 marks for any other reasonable issue with explanation**

Only the first point listed should be marked.

Up to 2 marks.

g) If the embedded value calculated at a risk free rate was treated as the capital base then AUSLIFE's excess assets above minimum capital requirements would be expected to increase even if it didn't enter into reinsurance offer 1, and it may be able to pay a dividend with other liquid assets elsewhere in the business. This is because there would no longer be a termination value floor and significant future cash inflows would be eligible. Entering into the reinsurance arrangement may not actually improve the capital position, but rather just monetize part of it. All else equal, such a change in capital rules would tend to reduce the attractiveness of offer 1.

Marking Guide

- **2 marks for noting that capital base would be higher under the rules change even if the reinsurance arrangement weren't to occur, and a reasonable explanation why**
- **1 mark for stating that this would tend to reduce the attractiveness of offer 1**

Up to 3 marks.

END OF MARKING GUIDE QUESTION 2

MARKING GUIDE: QUESTION 3 (29 Marks)

a) i)

Three possible reasons for the misalignment are:

- There may be a difference in the timing of recognition of claims between the AoP and EI analysis. For example, the AoP results provided may be on notified claims basis, while EI on incurred claims basis. Claims relating to a past incurred period may have been settled in the current period for an amount greater than their IBNR/RBNA reserves.
- There may be a difference in the allowance for policy liability components. For example, the AoP results provided includes both IBNR and RBNA but EI may not include both (or allowed for in a simplified manner).
- The AoP is on a net-of-reinsurance basis and the EI is on a gross-of-reinsurance basis. This can contribute to the contradictory results if, for example, the number of claims above the retention level was smaller than expected, there were claims with large sum insured (with sum reinsured capped at a maximum), or claims declined by the reinsurer.

The above reasons would be expected to have less impact on Lump Sum Mortality, relative to Lump Sum Morbidity, because:

- Timing of recognition of claims:
    - Shorter reporting delays associated with mortality claims (noting that the Lump Sum Mortality consists mainly of standalone Death policies) mean less difference between notified and incurred claims basis, and also means that the IBNR is expected to be smaller for Lump Sum Mortality.
    - The smaller Lump Sum Morbidity RPG size (compared to the Lump Sum Mortality RPG), means that the AoP results are more easily swayed by a few claims (with relatively long reporting delays).
- Allowance for policy liability:
    - Claims processing times are likely shorter for mortality claims compared to morbidity claims (due to the greater complexity associated with assessing morbidity claims). This means RBNA for Lump Sum Mortality is expected to be smaller.
- Reinsurance:
    - The larger size of the Lump Sum Mortality RPG will mean that the variability of actual to expected reinsurance claims amount will be considerably lower, reducing the impact on the AoP result.

Marking Guide

- **1 mark for each reason for misalignment, up to 3 marks**
- **1 mark for each explanation for less misalignment for Lump Sum Mortality, up to 2 marks**

Up to 5 marks

a) ii)

Two possible reasons relating to the presentation of AoP results are:

- The impact of discount rate changes over the year on the CICP reserve may not be included as part of the "claims experience profit" item but separately as part of the "discount rate changes" item.
- The difference in the actual and expected claim expenses associated with the CICP reserve may not be included as part of the "claims experience profit" but separately as part of the "expense" item.

Marking Guide

- **1 mark for each valid point**

Up to 2 marks

b) i)

Dear CFO,

In preparation for financial year-end 31/12/2018 reporting, please find below the changes to the valuation assumptions I am proposing for the policy liability valuation as at 31/12/2018 in respect of the Income Protection Related Product Group ("RPG").

I am proposing to:

- increase (strengthen) the claims incidence assumption by 17%; and
- increase (weaken) the claims terminations assumption by 10% for policies with 2-year benefit period, while keeping the claims terminations assumption unchanged for policies with "to age 65" benefit periods.

This proposal reflects the following considerations:

- For incidence:
  - The Experience Investigation indicates an apparent worsening trend in the incidence experience, with the Actual-to-Expected ratios increasing from 90% to 120% over the period from Jan 2015 to Sep 2018.
  - Over the same period, the aggregate Actual-to-Expected ratio is 117%, indicating worse than expected incidence experience over the past 3.75 years.
  - This trend is further supported by the YTD Analysis of Profit results showing an incidence experience loss of $15m, net of reinsurance (i.e. Item 3e in Table 3).
- These results support an increase (strengthening) in the claims incidence assumption by 17%.
- For terminations:
  - The Experience Investigation indicates an apparent improving trend in the terminations experience for policies with 2-year benefit periods (with the Actual-to-Expected ratios increasing from 96% to 111% over the period from Jan 2015 to Sep 2018), but indicates no clear trend for policies with "to age 65" benefit periods other than a potential one-off better than expected experience over YTD 2018.

- Over the same period, the aggregate Actual-to-Expected ratio is 110% and 101% respectively for 2-year benefit periods and for "to age 65" benefit periods, indicating better than expected terminations experience over the past 3.75 years for the former subgroup but close to expected experience for the latter subgroup.

- The improving trend for 2-year benefit periods and the potential one-off improvement for "to age 65" benefit periods over YTD 2018 is consistent with by the YTD Analysis of Profit results, which shows a terminations experience profit of $25m, net of reinsurance (i.e. Item 3f in Table 3).

- These results support an increase (weakening) in the claims terminations assumption by 10% for policies with 2-year benefit period, while keeping the claims terminations assumption unchanged for policies with "to age 65" benefit periods".

Marking Guide

- **1 mark on proposing incidence assumption (directional and level), up to 1 mark**
- **1 mark on proposing termination assumptions (directional and level) for 2-year benefit period**
- **1 mark on proposing termination assumptions (directional and level) for To Age 65 benefit period**
- **1 mark for each sensible justification of the proposed assumption, up to 3 marks**
- **1 mark for appropriate language and clear reasoning in the e-mail to the CFO**

Up to 7 marks

b) ii)

Additional investigations prompted by the experience loss on RBNA (Item 3c in Table 1) include:

- Investigate whether there have been any longer delays in making claim decisions, and whether this is expected to continue further into the future.

Additional investigations prompted by the experience loss on CICP relating to "other assumptions" (Item 3g in Table 1) include:

- Investigate the appropriateness of the "payment ratio" assumption (i.e. the ratio of monthly claim payment to the monthly insured benefit).

- Investigate whether there have been any changes to claims management practices such that less claims are being declined, and whether this is expected to continue further into the future. This would assist in assessing the appropriateness of the "decline rate" assumption (i.e. proportion of pending claims which are declined).

- Investigate the level of re-opened claims against expected, to assess the appropriateness of the "re-opened claim rate" assumption (i.e. proportion of closed claims which are being re-opened.

Additional investigations prompted by the information available in Tables 1 & 2 for claims incidence and terminations experience include:

- Perform experience investigations for claims incidence and terminations, split by further rating factors, such as sickness/accident, waiting periods, gender, age, claim cause (e.g. mental health, cancer) agreed value/indemnity etc.

- Obtain the analysis of profit results from past years (and if possible, based on current valuation assumptions), to provide a better view of the trends.

Note: The "Claims Paid or Claims Payable" or IBNR items (i.e. Items 3a and 3b in Table 1) are unlikely to prompt for additional investigations, given minimal experience profit or loss.

Investigations into checking the accuracy of the information provided in the Appendix is not a valid response.

Marking Guide

- **1 mark for each valid investigation to undertake**

Up to 3 marks

c)

Prior to Lump Sum Morbidity claims assumption change:

- Profit Margin % = PV Profit Margins / PV Claims = 112.5 / 750 = 15.0%.
- 2019 planned annual profit = 15.0% * $50m = $7.5m.

After Lump Sum Morbidity claims assumption change:

- PV Claims reduce by 10% or $75m, from $750m to $675m.
- PV Profit Margins increase $75m, from $112.5m to $187.5m.
- Profit Margin % = PV Profit Margins / PV Claims = 187.5 / 675 = 27.8%, i.e. increase by 12.8%.
- No impact on 2018 reported profit (as the RPG did not go into loss recognition).
- 2019 planned annual profit = 27.8% * ($50m * 90%) = $12.5m, i.e. increase by $5.0m.
- 2019 claims experience profit would reduce by $5.0m (this is just a re-allocation between planned and experience profit, and that the assumption change is not expected to impact the actual 2019 profit).

Marking Guide

- **1 mark for appropriate determination of impact on profit margin %**
- **1 mark for appropriate determination of impact on 2018 reported profit**
- **1 mark for appropriate determination of impact on 2019 planned annual profit**
- **1 mark for appropriate determination of impact on 2019 claims experience profit**

Up to 4 marks

d)

Memo

To: AOPLIFE Management

From: AOPLIFE Valuation Actuary

Subject: Income Protection RPG Loss Recognition Position

I refer to management's queries in regards to the loss recognition position of the Income Protection Related Product Group ("RPG"). Please find my responses below.

d) i)

Suggestion to reverse loss recognition position in the future

In regards to the suggestion to reverse the loss recognition position in the future via a favourable assumptions changes, please find below the considerations:

- Each year, the accumulated losses are recorded and carried forward to the following year.
- The accumulated losses can be:
  - increased by unfavourable non-economic assumption changes and unprofitable new business;
  - reduced by favourable non-economic assumption changes and profitable new business; and
  - run off in accordance with the run-off of the business.
- As such, the accumulated loss just before the suggested terminations assumptions change would be:
  - $50m capitalised from three years ago; plus
  - $20m capitalised this year due to the proposed assumption change; less
  - favourable profitable new business from three years ago to the point of terminations assumptions change; less
  - the amount of the capitalised losses that have been run off, if AOPLIFE had chosen to do so.
- For the loss recognition position to be completely reversed, the accumulated losses at that point of terminations assumption change would need to be fully offset, i.e. it is not just the $20m capitalised this year that needs to be taken into account.

So to answer management's query: unless the profitable new business sold over the period plus the run-off amount is able to offset $50m or more of the accumulated loss, the loss recognition would not be reversed out via the weakening of terminations assumptions.

Marking Guide

- **1 mark for appropriate language and format**
- **0.5 marks on recognising that the loss recognition position is accumulated and carried forward to the following year**
- **1.5 marks on outlining the components of the accumulated losses just before the suggested terminations assumption change**
- **1 mark on explaining whether the suggested terminations assumption change will fully reverse the loss recognition position.**

Up to 4 marks

d) ii)

Premium increase required

A 0.40% overall premium increase would be required to fully reverse a $20m loss recognition position, assuming no impact of the premium increase on policyholder behaviour in relation to lapses. (Note: This is calculated as $20m loss recognition position / $5bn present value of premiums.)

Marking Guide

- **1 mark for calculating the overall % premium increase required**

d) iii)

Impact of changes in policyholder behaviour in relation to lapses on the level of premium increase required

In the case of a premium increase:

- There is a risk that policyholder lapses are too high resulting in high lapse losses. However it is noted that this depends on whether the capitalised losses fully wiped out the deferred acquisition costs or whether lapses are occurring on policies where acquisition costs have been fully recouped (in which case policyholder lapses may in some cases result in lapse profits).
- There is also the risk of adverse selection by policyholders such that "healthy risks" lapses leaving a higher proportion of policyholders with "bad claims risk", resulting in overall worse claims experience. This can further worsen the losses on the Income Protection RPG.

Therefore, there needs to be a balance to ensure that the benefit from the premium increase (increased profitability of the RPG) does not outweigh the additional costs (potential lapse and claim losses).

Marking Guide

- **1.5 marks for each valid point that could impact the level of premium increase required as a result of policyholder behavior on the level of lapses.**

Up to 3 marks

END OF MARKING GUIDE QUESTION 3

END OF MARKING GUIDE

