Course Coverage

Question	Unit	Syllabus Performance Outcome and Learning Objective	Page Reference in Course Notes	Total Marks
1 a)	1	1.1.1	Ch21, 21.3	2
1 b)	1	1.1.3	Ch21, 21.6	9
1 c)	1	1.1.3	Ch21, 21.3, 21.5,	10
1 d)	1, 4	1.1.1, 4.8.2	Ch21, 21.3, 21.5, Ch27, 27.2, 27.4	11
2 a)	1, 2	1.1.1, 1.1.3, 2.4.3	Ch21, 21.5, 21.6 Ch24, 24.4, 24.5	7
2 b)	1, 2	1.1.5, 2.4.3	Ch21, 21.5, 21.6 Ch24, 24.5	11
2 c)	1, 2	1.2.1, 1.2.3, 2.4.3	Ch 22, 22.2, 22.8 Ch 24, 24.4, 24.5	9
3 a)	4	4.8.1, 4.9.3	Ch27, 27.2, 27.9	7
3 b)	4	4.8.2	Ch27, 27.4	7
3 c)	4	4.8.2	Ch27, 27.2, 27.3, 27.4	9
3 d)	4	4.8.2, 4.8.5	Ch27, 27.2, 27.5, 27.8	8

MARKING GUIDE: QUESTION 1 (32 Marks)

a)

The reinsurer would require a one-off repayment from EZLIFE because:

- Given the relatively high reinsurance commissions, the reinsurer would have accumulated a relatively large deferred acquisition costs (DAC) over the years in respect of EZLIFE's business.
- The new reinsurance terms significantly reduces the premiums that the reinsurer will receive in the future, in respect of all remaining business in-force as at 30 June 2019. This significantly reduces the reinsurer's ability to recoup the DAC, therefore the one-off repayment is expected to be largely used to compensate the reinsurer in regards to recouping DAC and reduced future profits on the in-force business.

Marking Guide

- **1 marks for each valid point**

Up to 2 marks

b)

To: The Board and management of EZLIFE

From: Appointed Actuary of EZLIFE

<u>Memo: Recommendation to adopt projection basis for policy liability valuations for EZLIFE</u>

EZLIFE currently adopts an accumulation basis for policy liability valuation. Given the change to the reinsurance terms applicable to the business from 1 July 2019 onwards, I would like to recommend EZLIFE to adopt a projection basis for policy liability valuation.

A projection basis would be **more appropriate** for the business from 1 July 2019 onwards because:

- An accumulation basis is appropriate and allowed for under LPS 340, where it is not expected to produce materially different policy liability results compared to the projection basis.
- Under the new reinsurance terms however, the upfront reinsurance commissions will be significantly reduced, that is, the large upfront adviser commissions will mostly be borne by EZLIFE. This large upfront acquisition cost would need to be deferred over the relatively long expected duration of liabilities of the retail lump sum risk business.
- The larger the upfront acquisition cost borne by EZLIFE, and the longer the expected duration of the liabilities, the more likely it becomes for the accumulation basis to produce materially different policy liability results compared to the projection basis.

It should be noted that there may be **potential implications of this methodology change on the recognition pattern of expected future profits** for the business because:

- Under the accumulation basis, an "acquisition expense recovery carrier" is used to run off the acquisition expense for the business. This carrier is generally the expected premium (representing how the acquisition expenses are recouped). Profit is implicitly recognised via this "acquisition expense recovery carrier".

- Under the projection basis, profit is explicitly recognised via a "profit carrier", chosen such that profit is recognised as services are provided to policyholders. In the case of EZLIFE's retail risk business, the expected claims are generally the services provided to policyholders. Therefore if EZLIFE choose to adopt expected claims as the profit carrier, then there can be changes in the profit recognition pattern.

- In the case where the expected premiums run off in a similar pattern to expected claims, the expected premiums can be used as the profit carrier. In such a case, the recognition pattern of expected future profits for the business under an accumulation basis and under a projection basis is expected to be more closely aligned.

However I would like to highlight that this methodology change by itself **would not change** the overall expected profitability of EZLIFE's business (just the recognition pattern).

In addition, adopting the projection basis could bring about **operational benefits** to the business, such as:

- There can be operational efficiencies given that projections of expected cash flows are likely already required for analysis of profit and liability adequacy tests (used to test for loss recognition under the accumulation method).

- Policy liability valuation on a projection basis gives better alignment with projections required for capital calculations, budgeting, and Embedded Value calculations. This alignment helps for better understanding of the results.

- Profit margin percentages are explicitly determined under the projection basis, which allows for better understanding of the profitability of the portfolio and better communication of any changes in the profitability.

Marking Guide

- **1 mark for each point on projection basis being more appropriate, up to 3 marks**
- **1 mark for each point on the potential implication of the methodology change on the recognition pattern and level of expected future profits, up to 3 marks**
- **1 mark for each point on the operational benefits which the projection basis could bring to the business, up to 3 marks**
- **1 mark for memo format and for the language used being appropriate for the Board and management, up to 1 mark**

Up to 9 marks

c)

Refer to the accompanying solution example spreadsheet.

Marking Guide

For sheet "Projection (Before Recapture)":

- **0.5 mark for appropriate projection of gross sum insured in-force (column D)**
- **0.5 mark for appropriate projection of gross premiums (column E)**
- **0.5 mark for appropriate projection of gross renewal expense (columns F)**
- **0.5 mark for appropriate projection of gross renewal commission (columns G)**
- **0.5 mark for appropriate projection of gross claims (column H)**
- **0.5 mark for appropriate projection of reinsurance premium and reinsurance claims (columns I and K)**
- **1 mark for appropriate projection of present values (columns L to R)**
- **0.5 mark for appropriate projection of Best Estimate Liability (column S)**
- **1 mark for appropriate projection of Policy Liability(column U, excluding cell U6)**

- **1 mark for appropriate calculation of Present Value of Profit Margins for projection year 0 (column T, row 10)**
- **1 mark for appropriate calculation of profit margin % (cell U6)**
- **0.5 mark for appropriate projection of Present Value of Profit Margins for projection years 1+ (column T, row 11 onwards)**

Up to 8 marks

For sheet "Projection (After Recapture)":

- **0.5 mark for appropriate allowance for reinsurance repayment on recapture (columns J, Q and S)**
- **0.5 mark for appropriate reference to reinsurance information on recapture (compared to sheet "Projection (Before Recapture)")**
- **1 mark for all other formulas equivalent to sheet "Projection (Before Recapture)".**

Up to 2 marks

d) i)

The impacts of the new reinsurance terms are as follows:

- The level of overall profitability of the business is expected to increase i.e. from an expected profit margin of 11.8% to 13.6%.
- Under the new reinsurance terms, EZLIFE is expected to be more sensitive to changes in lapse and claims experience, as illustrated in the following table:

Sensitivity	**% Reduction in present value of profit margins (net of reinsurance)**	
	Before new reinsurance terms	**After new reinsurance terms**
10% overall increase in claims incidence rate assumptions	4.2%	22.9%
10% overall increase in lapse rate assumptions	11.3%	19.2%

OR

Sensitivity	**Reduction in profit margin % (net of reinsurance)**	
	Before new reinsurance terms	**After new reinsurance terms**
10% overall increase in claims incidence rate assumptions	0.5%	3.1%
10% overall increase in lapse rate assumptions	0.2%	1.4%

- These results are expected due to shifting back a relatively large portion of insurance risk from the reinsurer to EZLIFE under the new reinsurance terms. The higher the insurance risk borne by EZLIFE, the higher the expected profit volatility, and the higher the expected level of profitability.

- It is noted however that the overall increase in level of profitability is greatly offset by the large repayment to the reinsurer on 1 July 2019.

Marking Guide

- **1 mark for the impact on expected level of overall profitability, up to 1 mark (0.5 mark if no reference to projections in part (c))**
- **1 mark for the impact on lapse and claims sensitivities, up to 1 mark (0.5 mark if no reference to projections in part (c))**
- **1 mark for outlining that more insurance risk is borne by EZLIFE after recapture, and therefore both higher profitability and higher profit volatility are expected**
- **1 mark for noting that the profitability is reduced by the payment upon recapture to the reinsurer**

Up to 4 marks

d) ii)

The expected impact of the new reinsurance terms on the Embedded Value of the business is:

- The increased claims risks would likely mean higher regulatory capital requirements, if the Insurance Risk Charge was positive (or turned positive under the new reinsurance terms). This means Adjusted Net Worth reduces, so the Embedded Value reduces due to discounting effects on the capital release.

- Shareholders would likely require higher cost of capital due to the higher profit volatility. This translates to a higher risk discount rate, reducing the Embedded Value.

- The increase in shareholder profit margins translates to an increase in the Embedded Value.

Arguments that can be put forward to the shareholders are:

- Expansion into other life insurance products (e.g. retail disability income, group insurance, life investment business) can help diversify the sources of EZLIFE's profit. In other words, it reduces the risk of concentrating EZLIFE's portfolio in just the retail lump sum industry and the industry-wide risks associated with it.

- In particular, EZLIFE could use the additional capital to expand to sell lifetime annuity products. The longevity risks on these products would act as a natural hedge against the mortality risks on the existing retail Death products. This would help reduce the claims risk for EZLIFE's business as a whole, i.e. reduce the risk of profit volatility borne by the shareholders.

- EZLIFE could use the additional capital to rapidly grow the retail lump sum risk business, but with level premium structure. The high upfront acquisition costs are recouped faster for level premium policies, hence lower lapse risk than the existing stepped premium business (at earlier policy durations). This would help reduce the lapse risk for EZLIFE's business as a whole, i.e. reduce the risk of profit volatility borne by the shareholders.

Marking Guide

- **1 mark for each valid point on impact on Embedded Value, up to 2 marks**
- **1 mark for each valid reason to put forward to shareholders, up to 2 marks**

Up to 4 marks

d) iii)

In regards to EZLIFE's approach of applying lapse rate assumptions:

- The approach for adopting assumptions should not impact on the actual volatility of the profit (which is mainly driven by the risk borne by EZLIFE).
- It however impacts on the volatility of the lapse experience profit monitored from month to month(as part of analyses of profit), to the extent that EZLIFE's actual lapse experience differs from the assumptions, in particular:
    - o The industry lapse rate assumptions may not be relevant to EZLIFE's lapse experience, due to possible factors such as different target markets and different distribution methods.
    - o Applying a single lapse rate across the portfolio may not be appropriate, as lapses at earlier policy durations are more likely to result in a lapse loss for EZLIFE than lapses at later policy durations (i.e. the large acquisition cost may not be fully recouped for lapses at earlier policy durations).
    - o The assumption of increasing the policy duration by one year for each projection year effectively assumes uniform lapses across the portfolio, which may not be reflective of EZLIFE's experience.

Marking Guide

- **1 mark for recognising that the assumptions adopted do not impact on the actual volatility of the profit, up to 1 mark**
- **1 mark for each explanation on how it impacts the volatility of the lapse experience profit, up to 2 marks**

Up to 3 marks

END OF MARKING GUIDE QUESTION 1

MARKING GUIDE: QUESTION 2 (27 Marks)

a)

Dear CFO,

You have recently enquired as to how the policy liability and the capital requirements of the proposed TermLife product will be determined and what, if any, differences there may be with the approach for the current YRT business.

Related Product Group

The existing YRT business is in a single Related Product Group ("RPG") where premiums are the profit carrier. This means that we expect to release profits on this business in line with when we expect the premiums to be paid.

There are a number of considerations in determining whether the TermLife product will be part of the existing YRT RPG or whether a new RPG will be required:

- An RPG is a grouping of products where the products are considered to exhibit benefit characteristics and pricing structures that are sufficiently similar.
- The size of the business. For small blocks of business, it is reasonable to group the business with similar business for profit margin and loss recognition reporting. This is to avoid having volatility in the results from entering and reversing loss recognition as a result of small volumes. Hence, initially, it may be a consideration to include TermLife in the same RPG as the existing YRT business. However, when volumes become more material, we will need to consider whether a separate RPG is required.
- RPGs are a group of products where the benefit characteristics and the pricing structures are sufficiently similar that they can be grouped together for profit reporting and loss recognition purposes. Comparing TermLife and the YRT business:
- The premium structures are different – the YRT has stepped rates that can be changed by the insurer. On the other hand, TermLife's premiums are level and cannot be altered by the insurer. This indicates that the products are sufficiently different to warrant TermLife to have its own RPG
- On the TermLife business, the policy term is longer than the premium paying term. For the YRT business, these terms are equal. If we were to choose premium as the profit carrier for the TermLife business, we would release all of the profit prior to the expiry of the contract. Hence, we would still be providing a service but not recognising any profits for that service. This would not meet the principles of LPS 340. As a result, claims would be a more suitable profit carrier as claims will be paid for the entire term of the policy. Products with different profit carriers need to be in different RPGs.

IBNR and RBNA

There is not expected to be a material difference in how the IBNR and RBNA are determined compared to the existing YRT business. The IBNR will still be determined based on the average delay until claim notification and the RBNA will be based on an assumed decline rate.

There may be some differences in the underlying parameters such as the claim delay or decline rate. These will be sourced from the Experience Studies as they are performed each year.

Capital Requirements

The table below sets out the differences in the Adjusted Policy Liability ("APL") and the Insurance Risk Charge ("IRC") assuming the TermLife product is written into a separate Statutory Fund ("SF3"):

	Existing Product	Proposed Product
APL	Assuming the business is profitable whereby future premiums exceed outgo, the APL will be based on the Best Estimate Termination Value ("BETV") which will be made up of the IBNR and RBNA.	Initially the APL will be based on the BETV as premiums will exceed claims. However, over the life of the contract, the BEL will become positive (as claims exceed premiums given premiums are flat) and will exceed the BETV (IBNR will be small given short delays and RBNA may also be small given relatively quick processing times
IRC	The IRC for the YRT business is driven by the time it would take the company to re-price in the event of adverse experience. The timing and the amount of the premium increase will drive the capital requirements of the product. Depending on the size of the assumed adverse experience relative to the existing profit margin, the IRC may be zero.	There are some key differences in determining the IRC for TermLife compared with the YRT business. As premium rates are guaranteed, the company cannot re-price to offset the adverse experience. However, as the reinsurance premiums are on a risk premium basis, the reinsurer can re-price. Over the life of the contract, the IRC would be expected to grow as the margin of premiums over claims reduces (and goes negative) as the term of the policy unwinds

Regards,
Valuation Actuary

Marking Guide

- **0.5 marks for definition of RPG**
- **1 mark for identifying the size of the business as a consideration and explaining when it would be appropriate to group / separate the products as it relates to RPGs**
- **1 mark for explaining the differences between the products in terms of premium structures (stepped vs. level) as it relates to RPGs**
- **1 mark for identifying that premium is not an appropriate profit carrier for the TermLife product due to the policy term being longer than the premium paying term**
- **1 mark for decision on RPG of the new product with justification.**

Up to 3 marks

- **1 mark for explaining there is no material differences in how the IBNR and RBNA are calculated for each products**

Up to 1 mark

- **1 mark for valid point on the differences in the APL between products**
- **1 mark for each valid point on the differences in the IRC between products, up to 2 marks**
- **1 mark for appropriate format and language of memo to the CFO**

Up to 3 marks

b) i)

Asset Risk Charge

Assets:

- On the asset side, minimal interest rate risk as cash is at call (duration is low). Hence, under the asset stresses, value of assets would not change materially – hence, ARC will be driven by the liability change.

Liabilities:

- Initially, APL will have a very short duration assuming that the BETV bites over the RFBEL and therefore ARC will not be significantly impacted by changes in interest rates. The RBNA is not impacted since just based on current sum insured and a decline rate (no discounting) and the IBNR would likely have a short duration given claims are notified relatively quickly for death (so limited impact on IBNR of interest rate change).
- Over the life of the policy, the APL will switch from being on a BETV basis to being on a RFBEL basis.
- RFBEL would have longer duration than the TV. Hence, ARC would be driven by interest rate reductions (RFBEL increases with limited change in asset values).

Duration Matching

- Accounting (profit) mismatch with capital will be greatest at the start of the contract when the BETV bites. In this scenario, changes in interest rates (up or down) may have limited impacted on capital position (as duration matched) but a large impact on profit (driven by the BEL and value of profit margins). The direction of stress will also be different – interest rate reduction will increase the APL but reduce the Policy Liability (“PL”).
- Over the life of the contract, the APL and PL should move in the same direction following an interest rate stress as PL and APL are both positive with RFBEL being the APL.
- The magnitude would be expected to be larger on PL as value of profit margins also impacted – these are not included in the APL.

Marking Guide

- **1 mark for identifying there is minimal interest rate risk on asset side due to cash at call**
- **1 mark for identifying that initially the APL has a short duration and the impact that interest rates changes would have on the ARC will small**
- **1 mark for explaining why the APL has a short duration initially (RBNA and IBNR comments)**
- **1 mark for identifying that the APL switches from being based on BETV to RFBEL over the life of the policy**
- **1 mark for stating that the duration would be longer under the RFBEL basis and therefore the ARC would be more sensitive to interest rate changes**

Up to 4 marks

- **1 mark for stating that the accounting profit mismatch with capital will be the largest at the start of the contract.**
- **1 mark for explaining mismatch of accounting profit with capital position at the start of the contract when duration matching to the APL**
- **1 mark for explaining that over the life of the contract, the APL and PL will move in the same direction**
- **1 mark for explaining impact of interest rate changes would be larger on the PL compared to the APL due to profit margins**

Up to 3 marks

b) ii)

- The CRO is correct in that the proposed TermLife product is also exposed to deteriorations in the lapse and claims experience. Over the life policy, if experience deteriorated, any strengthening of assumptions would be spread through future profit margins (where they existed). This is similar to the current YRT product.
- However, the implications of the risks are different as the premium rates are guaranteed. In particular:
    - As we cannot re-price, we cannot offset the stronger assumptions with assumed re-pricing. This will affect the calculation of the IRC, as re-pricing is not an available management action.
    - However, the reinsurer can increase the premium rates they charge us and this would also impact the value of future profit margins.
- As a result of this dynamic, there are some actions the company could take to mitigate against the impact of this outcome. These include:
    - Cease writing new business or increase premium rates for new business – both of these points would ensure that losses do not continue to grow.
    - Retention strategies for existing business (e.g. customer engagement) to reduce deterioration of lapse experience.
    - For new business, negotiate different reinsurance terms with the same or a different reinsurer. This could include getting the reinsurer to guarantee their premium rates.

Marking Guide

- **1 mark for outlining impact on new product on profit margins as a result of any assumption strengthening**
- **1 mark for outlining a valid implication of guaranteed premium rates not present in the existing product (e.g. no assumed repricing in IRC calculation)**
- **1 mark for each valid action with explanation, up to 2 marks**

Up to 4 marks

c) i)

Policy liability:

- Incurred claim reserves – should be available based off the premium and claim data in the GL, admin systems and claim systems. Underlying assumptions could be based off pricing (or their existing product if experience expected to be materially the same)
- UPR – assuming premiums paid monthly, take a half month of premium based on the GL data
- DAC – based on initial expenses and commission as per the GL amortized in line with expected levels (as per pricing assumptions) since lapse experience has been in line with expected
- All of the above done gross, reinsured and net based on the reinsurance treaty which TermLife is covered by
- LAT – Given no valuation model, cannot determine a BEL from the existing process. As assumptions for the BEL would likely to be based on pricing could take the following: Actual Premium * Expected BEL (time t from pricing) / Expected premium (time t from pricing). This is then compared with the UPR less DAC. This is done net of reinsurance

Adjusted Policy Liability:

- This will be based off the incurred claim reserves that were determined as part of the policy liability calculation

Marking Guide
- **1 mark for each valid point on a component of the Policy Liability, up to 3 marks**
- **1 mark for outlining that the APL will be based on the incurred claims reserves calculated for the PL, or other valid point on APL calculation**

Up to 4 marks

c) ii)

IRC:

- Could derive the value of year 1 profits from the BEL determination above and apply the stresses to this BEL. An alternative would look at the original pricing to see if there was an IRC in year 1 – for example, using the expected loss ratios and expense ratios in year 1, determine a stressed profit in year 1 using the actual volumes.
- Stresses on BETV can be applied (random and future) without much difficulty by scaling up the BETV by the size of the stress (as would be the case with the existing YRT business)

ARC:

- Asset data should be available from custodian – it should be possible to apply the asset shocks to these. We would also apply credit rate stress to the investment assets and default stress to any reinsurance asset and premium receivable. This relies on the asset data having the required inputs (duration, fair value, credit rating) in order to determine these amounts
- On the liability side, only the interest rate and inflation rate stresses apply – likely to be immaterial given short term of the liability. Could approximate by: IBNR * Interest Rate Change * Average Claim Delay

ORC:

- Follows formula as per LPS 118 so would use premium and APL data as already available from the General Ledger

Marking Guide
- **1 mark for each valid IRC point, up to 2 marks**
- **1 mark for each valid ARC point, up to 2 marks**
- **1 mark for valid ORC point**

Up to 3 marks

c) iii)

- The approach taken to the difference between the valuation model and approximate approach will depend on current practice with respect to model/data changes. Hence, depending on policies and past practices, could spread the BEL impact through margins (if available) or put through the P&L

- Depending on materiality, approach may warrant auditor engagement and reconciliations as to the drivers of the differences

Marking Guide
- **1 mark for valid point on the presentation and treatment of the difference**
- **1 mark for investigations of differences or auditor engagement**

Up to 2 marks

END OF MARKING GUIDE QUESTION 2

MARKING GUIDE: QUESTION 3 (31 Marks)

a) i)

Reported profit is:

- an accounting profit for statutory reporting purposes
- for e.g. regulatory bodies, auditors, and financial analysts

Embedded Value:

- is a measure of the worth of the business
- is for shareholders, i.e. in EVLIFE's case this is EVBANK

One advantage of using Embedded Value over reported profit in business planning purposes is:

- Embedded Value aligns the company's plans and operations with shareholder's objectives, as it reflects shareholder cost of capital and the profits distributable to shareholders.

Marking Guide

- **0.5 mark for each valid point on reported profit, up to 1 mark**
- **0.5 mark for each valid point on Embedded Value, up to 1 mark**
- **1 mark for valid point on advantage of using Embedded Value over reported profit in business planning purposes, up to 1 mark**

Up to 3 marks

a) ii)

Comparing "Expected return" under Table 1 and "Planned profit margins (including expected investment return)" under Table 2:

- Both items represent the unwinding of discount rates, but the discount rates differ in that Table 2 uses the risk-free discount rate, while Table 1 uses a higher risk discount rate (reflecting EVBANK's cost of capital and view of the risk of the business).
- "Expected return" includes "Planned profit margins (including expected investment return)", in addition to expected release of capital (which form part of distributable profits).

Considering why "Assumption changes – Non-economic" appears in the Embedded Value Analysis of Change report of Table 1 and not in the Analysis of Reported Profit of Table 2:

- Under Table 1: The impact of assumption changes are always capitalised immediately. The strengthening of lapse assumptions has immediately reduced the Embedded Value.
- Under Table 2: The impact of assumption changes are spread over future profit margins (i.e. it does not impact on the reported profit for 2018, as per APRA LPS340), as it has not resulted in the business going into loss recognition. If loss recognition did occur then the capitalised expected future losses would appear in the "Capitalised losses or reversals" item.

Marking Guide

- **1 mark for each valid point on comparing "Expected return" under Table 1 and "Planned profit margins" under Table 2, up to 2 marks**
  1 mark for each valid point in considering why "Assumption changes – Non-economic" appears under Table 1 and not in Table 2, up to 2 marks

Up to 4 marks

b)

To: CFO

From: Valuation Actuary

I refer to your question on how the Value of In-force Business (VIF) is expected to change over time.

The VIF is comprised of two main components:

- Present value of expected future profits (including investment return on assets)
- Present value of expected future capital releases.

(As per Chapter 27 of the course notes: "The value of in force business is the present value, at the hurdle rate (or risk discount rate), of future distributions to shareholders of profits and capital. It excludes capital that has already been included in the adjusted net worth. **The amount that can be distributed at the end of each year is the profit for the year, plus the amount of capital that can be released.**")

Together, these form the present value of future distributions to shareholders of profits and capital, in respect of the in-force business. Generally the VIF will reduce as profits emerge and capital is released.

Two factors that will affect the change in VIF over time of EVLIFE are the rapid growth in new business and the deterioration in lapses, which are outlined below.

<u>Lapse experience continues to deteriorate:</u>

The present value of expected future profits is expected to change as follows over time:

- If lapse experience continues to deteriorate, the overall profitability would reduce if further strengthening of the lapse assumptions is required.
    - o The reduction can be significant, as lapse experience is generally a key driver of profitability for stepped-premium YRT business with high acquisition costs (as the acquisition costs are deferred and recouped from premiums received over a number of years after policy commencement).

The present value of expected future capital release is expected to change as follows over time:

- If the lapse assumption increases then the release of regulatory capital will occur at a faster rate. However the benefit of this to the VIF will be more than offset by the reduction in the PV of expected future profits.
- The residual uncertainties following the lapse assumption change may lead to the lapse stress being increased resulting in an increase to the IRC.

- The reduction in volume due to higher lapses may result in the ORC being reduced.

Rapid Growth in New Business:

The present value of expected future profits is expected to change as follows over time:

- As the level of sales grows increases, the PV of expected profits will increase, as long as the new business has positive profit margins (i.e. EVLIFE is not making losses on new business). This increase in PV of expected profits will be offset by the release of profits from the in-force business.

The present value of expected future capital releases represents the overall amount of capital required on the business (allowing for discounting effects). This is expected to change as follows over time:

- Capital required for new sales is high due to the need to fund the large acquisition costs in addition to the capital needed to satisfy regulatory requirements. With rapid sales growth this could quickly exceed the release of capital from the current business, causing the PV of expected future capital releases to increase.

- Increase due to further increases in the Operational Risk Charge (ORC) due to the **rapid** growth. The ORC is the component of the regulatory capital requirement (as per APRA standards) which cover operational risks, and as per APRA standards, the level of ORC is driven by growth rate of the business.

- If the new business being sold is sufficiently profitable, then this may cause a reduction in the Insurance Risk Charge (IRC).

Marking Guide

- **1 mark for listing the two components of Embedded Value**
- **1 mark for outlining that the VIF will reduce over time as profits and capital are released**
- **1 mark for mentioning that lapse experience deterioration will reduce profitability if assumptions are strengthened or other valid point on impact to expected future profits due to deterioration in lapse experience**
- **1 mark for a valid impact on the present value of future capital releases due to lapse experience deteriorating**
- **1 mark for outlining that the PVPM is expected to increase in line with sales growth, provided new business is profitable (or other factor that is related to EVLIFE)**
- **1 mark for a valid impact on the present value of future capital releases due to rapid growth in new business (or other factor that is related to EVLIFE)**
- **1 mark for the language used being appropriate for the CFO (who has no life insurance background)**

Up to 7 marks

c) i)

The potential impacts on the pattern of target surplus release over the life of the in-force business are as follows:

- For stepped-premium YRT business, the claims risk is likely to increase over time, due to reasons such as aging of policyholders, and affordability issues hence policyholders staying in-force are more likely to be those who are likely to claim.

- Furthermore, the CICP has a longer duration than the annual sum insured, as claims can continue past the premium term of the policy, and therefore may have a slower run-off pattern compared to sum insured.

- The combination of the above factors means that the PCA (which is driven by the claim risk and CICP) is likely to have a slower run-off than the annual sum insured in-force.

- The change in methodology will therefore likely lead to a slower release of Target Surplus and as such, the Embedded Value is expected to reduce under the new methodology due to the higher cost of capital.

Marking Guide

- **1 mark for outlining claims risk for YRT business will increase over time**
- **1 mark for outlining CICP has a longer duration than annual sum insured**
- **1 mark for comparing the pattern of target surplus release under both methodologies**
- **1 mark on the likely impact on the Embedded Value**

Up to 3 marks

c) ii)

Scenario 1

The likely drivers are:

- Increase in investment assumption due to higher expected investment return on assets. This increases the Embedded Value.

- Increase in capital requirements due to greater asset liability mismatch in respect of the disabled lives reserves. This reduces the Embedded Value (due to reduced ANW and discounting effect).

(Note: The risk discount rate is unlikely to change for a change in investment policy on just the disabled lives reserve. The risk discount rate represents the risk of the entire business.)

Scenario 2

The likely drivers are:

- Increased premium income. This increases the Embedded Value.

- Shock lapses (and selective lapsation) due to increase in premium rates. This reduces the Embedded Value.

Scenario 3

The likely drivers are:

- Allowance for the impact on unit costs due to out-sourcing. This may include short-term redundancy costs (reduces Embedded Value), or long-term expense savings (increases Embedded Value).

- Termination rates may improve under a specialist provider reducing claims costs (increases Embedded Value).

- Increase in operational (or reputational) risks associated with out-sourcing, resulting in higher capital requirements (including target surplus). This reduces Embedded Value (due to reduced ANW and discounting effect).

Marking Guide

- **1 mark for each valid point for Scenario 1, up to 2 marks**
- **1 mark for each valid point for Scenario 2, up to 2 marks**
- **1 mark for each valid point for Scenario 3, up to 2 marks**

Up to 6 marks

d) i)

Three key adjustments are:

- Remove franking credits, as this is not applicable to the sole shareholder of EVLIFE (EVBANK), which is an overseas bank.
- Adjust for the capital required (including target surplus) on the business to reflect EVBANK's view of the risks of the business (e.g. EVLIFE may consider increasing the capital held in relation to operational risks, in light of the recent reputational issues).
- Adjust for unit cost levels. EVLIFE may have higher unit costs than ALIFE, due to economies of scale available to a large life insurer which may not be available to EVLIFE.

Marking Guide

- **2 marks for each valid point with explanations, up to 6 marks**

Up to 6 marks

d) ii)

This can be possible due to the higher discount rate applied on Embedded Value as compared to valuation (perhaps reflecting the higher operational risks in light of the recent reputational issues).

What this means for ALIFE is that the new business on this portfolio no longer satisfies cost of capital required by ALIFE's shareholders and ALIFE may consider closing the portfolio to new business.

Marking Guide

- **1 mark for valid point on the reason for negative Value of New Business, up to 1 mark**
- **1 mark for what a negative Value of New Business means for EVLIFE, up to 1 mark**

Up to 2 marks

END OF MARKING GUIDE QUESTION 3

END OF MARKING GUIDE