INSTITUTE OF ACTUARIES OF AUSTRALIA

COURSE 2A LIFE INSURANCE
MAY 2005 EXAMINATIONS

MARKING GUIDE

Level of Difficulty

Question	Syllabus Aims	Units	Knowledge & Understanding	Straight-forward Judgement	Complex Judgement	Total Marks
1a	12	4			3	3
1b	2, 12	1 & 4		2		2
1c	2, 12	1 & 4	2	2		4
2a	9	3	2.5			2.5
2b	9	3	2.5			2.5
2c	9	3	3			3
2d	9, 11	3 & 4		5		5
2e	9, 11	3 & 4			6	6
3a	7, 8, 11	3 & 4		3		3
3b	12	4		3		3
3c	11, 12	4			6	6
4a	4,8,9	2,3		4		4
4b	4,6,8,9	2,3		6		6
4c	1,6	1,2			4	4
4d	1,6	1,2			4	4
5a	5	2	6			6
5b	5	2		2	6	8
5c	5, 14	2, 5			4	4
6a	8, 9, 10	3		2		2
6b	8, 9, 10	3		6		6
6c	8, 9, 10	3		2		2
6d	8, 9, 10	3		4		4
6e	All	All			10	10
TOTAL			**16**	**41**	**43**	**100**

Answer all 6 questions.

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QUESTION 1 **(9 Marks)**

Analysis

Component	Aim	KU	SJ	CJ	Total
Part (a)	12			3	3
Part (b)	2, 12		2		2
Part (c)	2, 12	2	2		4
Total		2	4	3	9

Question

You are a product actuary working for a company that is thinking of releasing a new single premium investment linked product (both super and non-super versions). The marketing manager is aware that dollar fee disclosure is likely to be implemented in the near future and has therefore requested the evaluation of three different fee structures for the new product.

Dollar fee disclosure means that the fees that are charged on the contract have to be shown as dollar amounts in the year they are charged. All Product Disclosure Statements (PDS's) must display the indicative cost of the fee structure in dollars for a 'standard' contract. A standard contract is defined as a single premium of $15,000 invested for 10 years with an investment return of 8.00% per annum (after tax but before fees) credited annually at the end of each year.

The fee structures to be evaluated are:

	Structure 1	Structure 2	Structure 3
Initial Fee	5%	1%	0%
Management Fee	1.5%	1.3%	1.98%
Annual Policy Fee	$0	$120	$0

Note: The Initial Fee is charged on the single premium.
The Management Fee is an annual fee, charged as a % of the end of year account balance.

One of the actuarial analysts has calculated the following prescribed tables (which have to be shown in the promotional material):

Time	Total Fees ($) Structure 1	Total Fees ($) Structure 2	Total Fees ($) Structure 3
0	750.00	150.00	0.00
1	230.85	328.49	320.76
2	245.58	340.56	339.56
3	261.25	353.42	359.47
4	277.91	367.14	380.54
5	295.64	381.75	402.84

6	**314.51**	**397.33**	**426.45**
7	**334.57**	**413.94**	**451.45**
8	**355.92**	**431.65**	**477.91**
9	**378.63**	**450.52**	**505.93**
10	**402.78**	**470.63**	**535.58**
Total	**3,847.64**	**4,085.44**	**4,200.49**
NPV at t=0	**2,748.84**	**2,724.86**	**2,718.87**

Time	**Account Balance Structure 1**	**Account Balance Structure 2**	**Account Balance Structure 3**
10	**26,449.33**	**26,501.11**	**26,514.03**

The expected earning rate of 8% has been used to discount the cash flows.

(a) Provide your recommendation, with reasons, as to which fee structure you think the company should adopt with regard to dollar fee disclosure from a marketing perspective. (3 marks)

(b) You have now determined the following expense (including commission) information for this size of policy. Would you recommend a different fee structure if you were only considering the pattern of expense cash flow? (2 marks)

Time	**Expenses ($)**
0	**600.00**
1	**233.40**
2	**247.27**
3	**262.06**
4	**277.84**
5	**294.66**
6	**312.62**
7	**331.79**
8	**352.26**
9	**374.12**
10	**397.48**
Total	**3,683.51**
NPV @ t=0	**2,593.08**

(c) What other considerations would you take into account before finalising your recommendation regarding the fee structure? (4 marks)

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QUESTION 1: SOLUTION **(9 Marks)**

(a) Structure 3 has a number of advantages:
- an even pattern of charges, i.e. no large up front charge;
- results in the largest account balance for the client (slightly lower overall charges together with the interest effect on deferment).

However, Structure 3 does have the disadvantage that it has the highest total fees in dollar terms. Customers may not understand the net present value concept and find it confusing that compared to competitors (who may adopt Structure 1 or 2), such a structure has the highest dollar fees but also the largest account balance.

Despite this disadvantage, I think Structure 3 is still preferable from a client information perspective as it is an easy structure to understand and the client has a small regular payment taken out of their account each year and the largest account balance. I think this would be more appealing from a marketing point of view.

Notes to markers:

Structures 1 and 2 could also be justified with a good argument.

1 mark for making a recommendation, 2 marks for argument justifying the decision. Max 3 marks.

(b) When the consideration relates to covering expenses, the main criterion is that the fee cashflows match as closely as possible that of the expenses. A perfect match is unlikely ever to be achieved. Hence, a fee structure minimising this strain is preferred. (The ideal preference is for the income to be received prior to the outflow being incurred).

This difference in perspective means that Fee Structure 1 now has more appeal as it can be seen that it results in no initial strain, negligible strain in the early years and has the highest present value.

2 marks.

(c) Before deciding on a finalised fee structure it is important to do a proper cashflow projection and sensitivity test. 1 mark

Hence, it would be necessary to test all three structures to ensure an appropriate balance between marketing and pricing considerations. 1 mark

In particular, it would be necessary to make assumptions covering the following:

- surrenders;
- expected policy size;
- likely investment earning rates (the proposed published rate may well be inappropriate for the investment options being offered and the applicable tax rate – after all Super & ordinary would have different tax rates);

- it is also unlikely that the shareholder would want such a low rate of return and thus, a more appropriate discount rate should be used.

0.5 mark for each of these varying assumptions, maximum of 2 marks.

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QUESTION 2 **(19 Marks)**

Analysis

Component	Aim	KU	SJ	CJ	Total
Part a)	9	2.5			2.5
Part b)	9	2.5			2.5
Part c)	9	3			3
Part d)	9, 11		5		5
Part e)	9, 11			6	6
Total		8	5	6	19

Question

You are the product actuary for a life insurance company. To date the company has sold only whole of life insurance and yearly renewable lump sum risk products.

New business sales have not increased for a number of years. In addition equity markets have been volatile and have trended downwards over the past few years.

The marketing manager has decided that this is the ideal time to diversify the product range and launch a regular premium capital guaranteed investment product. This product will provide an account balance equal to the accumulation of premiums less fees, with interest credited annually. The fees will be a % of premium, an annual dollar policy fee and a % of assets. There will be no surrender charges. The rate to be declared is linked to the rate of interest earned on the assets as shown in the Company's accounts less the asset fee.

You have been asked to determine the appropriate expense assumptions for this new product and are about to commence your expense analysis.

(a) **What are the main categories of expenses to be considered (i.e. into what categories would you would divide the expenses into)?** **(2.5 marks)**

(b) **How would you express the results of your analysis in a form suitable for use as the expense assumptions used in pricing your existing contracts.** **(2.5 marks)**

(c) **Discuss what adjustments you make to the results of this analysis to determine pricing assumptions for the new capital guaranteed product.** **(3 marks)**

(d) **Describe how each of these expense components would relate to the fee structure for the new contract, and how you would check to ensure your fee structure was adequate.** **(5 marks)**

(e) **The CFO has announced that he intends to introduce an extensive cost cutting program next year. He expects expenses will reduce by 20% across the company. The marketing manager having heard this announcement thinks that you should reduce your expense assumptions, and hence fees on the new product**

by the same 20%. Draft a memorandum to the marketing manager outlining your opinion on his request. (6 marks)

QUESTION 2: SOLUTION **(19 Marks)**

(a) Expenses should be divided into the following categories:

- Initial
- Renewal
- Development
- Investment
- General overhead

0.5 mark each to maximum of 2.5 marks

(b) Results could be presented in the following form:

Initial expenses	$ per new policy
	% of new annual premium
	% of new sum insured
Renewal expenses	$ per in force policy
	% of in force premium
Development	$ per in force policy
	% of in force premium
	% of total assets
Investment	% of total assets
General overheads	$ per in force policy
	% of in force premium
	% of total assets

0.5 mark for each section, maximum 2.5 marks

(c)

Firstly, remove the components that have no relevance to this product, for example underwriting and medical costs.

Secondly, adjust the variable components that are known to vary from one product to another, for example commission and stamp duty.

Finally, identify those activities that will be required for the new investment product that are currently not performed by the company (e.g. issuing statements and other product reporting material) and determine an appropriate assumption in relation to these costs.

3 marks

(d)

For each type of expense, acquisition expenses would be separated from the ongoing expenses, and set as a % of premium. 1 mark

The annual per-policy expenses would be totalled and would form the basis of the policy fee provided this was not excessive. If this annual component is too high, use an appropriate marketable level and recover the balance of these costs with the % of assets fee. 1 mark

The investment expenses would be handled as a deduction to the interest rate, i.e. incorporated into the % assets fee used in the formula used for declaring the interest rate credited. 1 mark

The % of total assets expenses would be combined to form the basis of the annual asset fee charged. 0.5 mark

The remaining expenses, i.e. those expressed as a % of premium, would be combined to form the basis of the % of premium fee. 0.5 mark. Alternatively, this could be expressed as a % of assets and increase the asset fee. 0.5 mark

To check the adequacy of the fee structure a profit test model would be set up to include the expected fees as income and the expected expenses as outgo. 1 mark

This model would be run and sensitivity analysis done to ensure that the average contribution of each policy meets expenses adequately and that this remains robust with changing circumstances. 1 mark

To a maximum of 5 marks. Note the above is a model solution but given the general nature of the question, there are many appropriate solutions that could be presented.

(e) Should be in memo format. 1 mark (CJ).

Memo to: Marketing Manager
From: A.N. Actuary
Date: 17th May 2005
Subject: Expense and Fee Reduction

You have asked for my opinion on whether I think the expense assumption and fees should be reduced by 20% because of the prospective expense reduction program. I think it would be unlikely to be able to take the full 20% reduction into account. Reasons include:

This reduction is an intention, but by no means a certainty. Taking this into account before there is any evidence would place the company under additional financial strain and risk. I would recommend a more prudent course of action and wait to see the first signs of success.

Being able to reduce expenses 20% across the company is an unlikely achievement. It is more likely that one particular element of expenses will be affected in the short term, e.g. salary costs, which would affect some expense components, but not others. It is also likely to affect some products differently to others. Hence more work would be needed to determine exactly how the assumptions should alter. It is not this simple.

A 20% reduction in expenses does not relate directly to a 20% reduction in fees. The % discount to the premium or fees that would be attributable to a 20% reduction in expenses could only be determined after profit testing the new assumption and changing the premium/fee scale.

Fees also recover the costs of commission. It is unlikely that commission rates would also be reduced by 20%.

Even if there were a 20% reduction in expenses, a 20% reduction in fees would also result in a reduction in the profit margin (as a % of assets).

It is likely to result in far less than a 20% reduction on fees as recovery of office expenses make up only a component of the charging structure.

1 mark per point to a maximum of 5 marks, and 1 mark for format. Total 6 marks.

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QUESTION 3 **(12 Marks)**

Analysis

Component	Aim	KU	SJ	CJ	Total
Part a)	7, 8, 11		3		3
Part b)	12		3		3
Part c)	11, 12			6	6
Total			6	6	12

Question

The product actuary of your company has asked an actuarial analyst to calculate premium rates for a new product the company wishes to release.

The product is a level premium term insurance for terms up to 10 years. The sum insured remains level throughout the policy term.

The analyst has been given the following assumptions:

Mortality **100% IA 90-92 (Male) ultimate**

Expenses

Initial **$90** **per policy**
Renewal **$23** **per policy from year 2 onwards**

Commission

Initial **2.5%** **of annual premium x term of policy**
Renewal **1.0%** **of each annual premium including the first**

Interest **6.5%** **per annum**

Sum insured **$100k** **(average) for all policies**

All premiums are annual.

A set of premium rates has been determined which meets the company's profit requirement. However, the actuarial analyst has noticed an issue with the premium rates and has asked you for help. A snapshot of the premium rates causing the issue is below:

Entry Age	Term									
	1	2	3	4	5	6	7	8	9	10
35	171.59	135.60	122.73	116.05	111.96	109.22	107.40	106.19	105.31	104.75
40	200.71	166.65	155.82	150.62	147.86	146.33	145.58	145.31	145.33	145.64
45	259.95	226.89	216.91	212.62	210.86	210.40	210.69	211.62	213.07	214.89
50	332.25	300.26	291.46	288.87	288.99	290.49	293.07	296.50	300.67	305.48

The analyst's calculations have been checked and verified.

(a) What issue did the analyst identify and why did it arise? (3 Marks)

(b) Why does this make these rates inappropriate to use in practice? (3 Marks)

(c) Suggest 3 different ways to resolve the problems and what issues may arise from each suggestion. (6 Marks)

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QUESTION 3: SOLUTION **(12 Marks)**

(a) The issue is that generally premium rates decrease with term. This will mean that every 35 year old will purchase a 10 year policy and lapse it at the duration they originally wanted e.g. why pay $111.96 for a 5 year policy when the 10 year policy can be purchased for $104.75 and lapsed after 5 years. At the older ages i.e. 50, the premium rates decrease with term and then increases with an increase in term. 1 mark

At the younger entry ages these results are due to the spreading of the acquisition expenses over the greater term of the policy. 1 mark

At the older entry ages these results are due to the shape of the mortality curve becoming steeper as age increases. The premium for longer durations increase due to the increase in mortality being greater than the marginal reduction in expenses when expenses are spread over an additional year. 1 mark

Total 3 marks

(b) The rates are inappropriate in practice as:

- This result makes the rates seem illogical and would make it difficult for the sales force to explain to clients.
- The lapse and re-entry issue would lead to an increase in administrative costs associated with processing these policies.
- It will make premiums at higher entry ages for longer terms look unattractive to clients and would thus alter the age distribution of new business.
- Rates such as this mean that the mortality curve is becoming quite steep and thus the averaging effect over a number of years introduces mortality strain on premiums. If the mortality curve is fairly flat the premiums reduce in a regular fashion as term increases. This means that proportionately small parts of the earlier premiums are used to pay for claims later in the policy term. When the mortality curve steepens, the redistribution between early premiums and late claims is fine while experience exactly matches that expected, but any slightly adverse change in experience can lead to a mortality cost that exceeds the accumulated premium reserves by a large margin.

1 mark for each point. Maximum of 3 marks.

(c) Different methods could include:

<u>Method 1</u>

Step the premiums in 2 or 5-year bands, rather than having level throughout. This would make the product complicated and defeat the purpose of having level premiums to some extent.

Method 2

Change the expense structure (and hence assumptions) to redistribute the timing of the expenses. For example decrease the initial expenses/commission and increase the ongoing expenses/commission. You would need to ensure the adjustment was roughly equivalent at the average term of policies expected under the contracts. This will result in a lower amount of up front costs having to be spread over the years for the shorter contracts, thus making the shorter term contracts less expensive and the longer term more expensive.

Method 3

Set the premium to be that of the 1-year term policy for each age. This is a neat way to solve the problem, but the resulting rates are unlikely to be marketable as the company is recovering the full amount of acquisition expenses in each year's premium.

2 marks per method and discussion. Markers please note there are other methods that may well also be valid, marks should be given for these also. Maximum of 6 marks.

QUESTION 4 **(18 Marks)**

Analysis

Component	**Aim**	**KU**	**SJ**	**CJ**	**Total**
Part a)	4,8,9		4		4
Part b)	4,6,8,9		6		6
Part c)	1,6			4	4
Part d)	1,6			4	4
Total			10	8	18

Question

You are the product actuary for a medium sized life insurance company in Australia. A newspaper article in this morning's financial press has announced that a cure has been found for cancer. This involves the administration of a new drug as a single injection to someone diagnosed with cancer. Testing of the cure indicated a 98% success rate in effecting a complete cure. The drug is not effective when used as a vaccine, as, although it is not harmful, it is only effective when administered post diagnosis. The cost of the injection is expected to be less than $AUD100.

Your company writes the following products:

i) Term insurance
ii) Trauma insurance
iii) Annuities
iv) Unit linked investment products

The Senior Management team is concerned about the effect this new drug may have on the company's business and have asked you to provide them with your views on the following:

(a) How are each of the above products likely to be impacted in the short-term (i.e. less than 12 months)? **(4 marks)**

(b) Apart from these short-term impacts, how are each of the above products likely to be impacted in the longer term? **(6 marks)**

(c) Discuss 4 new risks facing the company as a result of this new treatment. **(4 marks)**

(d) What actions could the company take to mitigate these 4 risks? **(4 marks)**

QUESTION 4: SOLUTION **(18 Marks)**

(a)

Term insurance

- Reduction in claim numbers and amounts paid out on claims.
- Reduction in claims expenses due to the reduced number of claims and investigation costs.
- Marginal reduction in underwriting expenses, as cancer no longer needs to be rigorously underwritten for.

Trauma insurance

- Unlikely to be a change to claim numbers and amounts paid, as payment is made based on diagnosis of the condition and the drug is only effective after diagnosis. The issue would revolve around the patient having the drug administered within the waiting period, thus resulting in no claim being payable, or waiting.

Annuities

- Increase in annuity payments.
- Increase in payment administration expenses.
- Reduced commutation of annuities by those diagnosed who previously would have needed funds for treatment.

Unit linked investment funds

- Marginal increase in funds under management (FUM) as fewer withdrawals due to death.
- Marginal increase in FUM as fewer withdrawals to pay for medical and support expenses for those alive with cancer.
- Marginal increase in FUM from additional regular contributions from those investors who would previously have been withdrawing/dying.

0.5 mark for each point, maximum 4 marks, provided at least 1 point provided for each product.

(b)

Term insurance

- Possible reduction in new business as cover loses its appeal to some people and increased longevity means fewer claims within the policy term.
- Possible increase in lapses for the same reason.
- Premium reductions due to mortality improvement.

Trauma insurance

- Simplification of proposal forms.
- Removal of cancer cover from new contracts (although still traumatic if cure does not work). Suggest change definition of cancer to cover ineffective cure.
- Reduction in premium rates for new contracts.
- Possible reduction in new business as cancer cover was large part of the appeal of this product.
- Increase in lapses for the same reason.
- Possibly, (depending on legal ability to change terms and conditions), the removal of 'cured' cancer cover from existing contracts, which would lead to reduction in claims and premiums on in force business also, as well as corresponding increase in lapses. Companies may also consider a change that restricts payment if the patient elects to wait for the treatment, when available, to ensure payment of the claim.

Annuities

- Increase in new business due to increase in longevity of people and improved long-term health prospects.
- Increase in purchase price/reduction in annuity payments for the same purchase price.

Unit linked investment funds

- Increase in new business as more people with funds to invest as they are alive and not sick, therefore likely to be earning and saving.

1 mark for each point to a maximum of 6 provided at least 1 point provided for each product.

(c) Risks include:

Require additional capital - Longevity

The in force annuity portfolio is going to become very expensive and will need additional reserves to support it.

Expense Loss

Due to reduced need for/coverage of the term and trauma products resulting in new business volume and in force volume decreasing, there will be a potential strain on overhead expenses.

Relevance of life insurance

Linked to the risk above is the relevance of the industry as a whole. If this change affects the public's overall view of insurance cover, to the extent that it becomes irrelevant, the business may become too expensive to write given the capital required to support it and life companies may close to new business.

Lapsation on term insurance

People may lapse policies, as they no longer see a need for the cover, even with a reduction in premium. This is likely to result in a loss to the company and eventually the product may be unable to support its overhead expenses, due to lack of volume.

Anti Selection - Selective lapsation on trauma

Healthy lives will lapse to either give up cover or move to a new policy with a cheaper premium rate. The unhealthy lives, who would be unlikely to pass underwriting, will stay with the old cover and thus the experience of this block of business will deteriorate rapidly.

Moral hazard

The publicity that is likely to result in relation to trauma insurance may result in an increase in ambit claims, with or without the assistance of the medical fraternity. These additional claims run the risk of increasing claim payments, depending on the thoroughness of the company's claims management, or at least increasing claims management costs as a result of investigations.

Legal risk

Any attempt to alter the terms and conditions of the trauma policies, or rely on various clauses, to prevent payment of cancer claims where a cure is then effected, or if treatment is refused within the waiting period, will always be subject to the risk of a challenge in court.

1 mark for each risk. Maximum of 4 marks

(d) Actions to mitigate these risks include:

Require Additional Capital - Longevity

Mitigation – to some extent this is mitigated by the improvement in mortality/ongoing morbidity of the other products, but these are usually paid away in reduced premium rates. Try and reduce reduction in premium rates. Management may include increasing reinsurance, selling the block of business and adjusting the investment strategy of reserves to a longer-term structure.

Expense Loss

Management may include expansion into other product classes or a shift of concentration to new annuity sales and new FUM.

Lapsation on term insurance

Management may include an education program or lapse reduction program, although the likely effectiveness of this is doubtful. Management may also include the extension of the contract term of cover, i.e. to age 80 from age 70, to allow for the longevity improvement and thus make the cover more relevant to the population.

Anti Selection Selective lapsation on trauma

Management may include pricing the new contract with a margin to allow for the anticipated poor experience of the in force block of business. The ability to do this may depend on the level of competition with premium rates, as the company would lose new business to competitors if the rates were too high.

Moral hazard

Management may include providing information to the press about the unlikely possibility of these claims succeeding and that making false claims is attempted fraud.

Legal risk

Management may need to obtain external legal counsel prior to making such a change or lobby government for a special one.

1 marks for each strategy. Max 4 marks.

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QUESTIONS 5 & 6

Questions 5 and 6 both refer to the following scenario.

Scenario

Magic Life Pty Ltd is a medium sized life insurance company operating in Australia. The Chief Executive Officer and several of the directors have used their authority to remove money from the company's statutory funds and have relocated to a country without an extradition treaty with Australia. As a consequence, the company has just been placed under Judicial Management in accordance with the Life Insurance Act 1995. The company has ceased writing new business, although premiums under existing policies can continue to be accepted.

You are a consulting actuary. The Judicial Manager has retained your services to provide independent actuarial advice.

The status of the Statutory Funds, both before and after the directors' action, is as follows:

Fund	Assets prior to Directors' action ($'m)	Solvency Requirement ($'m)	Assets after Directors' action ($'m)
SF 1	1,275	1,260	1,225
SF 2	750	740	650
S/H	25	10	25
Total	2,050	2,010	1,900

Note: SF is an abbreviation for Statutory Fund.
S/H is an abbreviation for Shareholders' Fund.

From the recent valuation (prior to the directors' action), the Judicial Manager has also been able to provide you with the following breakdown of the business:

Fund	Product group	Class	Policyholder Account Balances ($'m)	Minimum Termination Value ($'m)	Value of In Force Business ($'m)
SF 1	Investment Linked	Super	1,240	1,240	55
SF 2	YRT & riders	Non-Super	n/a	40	200
SF 2	YRT & riders	Super	n/a	25	125
SF 2	Defined Contribution	Super	655	655	30
Total				1,960	410

Note: YRT is an abbreviation for Yearly Renewable Term.

The Defined Contribution product is an investment account product where the employee and employer contribute fixed amounts and the benefit is defined as an account balance that accrues with credited interest. The account balance

plus accrued interest is guaranteed by Magic Life not to decrease. The interest rate is reviewed monthly and interest is also credited monthly.

The superannuation YRT product is only offered in conjunction with the defined contribution product with premiums being deducted from the account balances.

The Minimum Termination Value is equal to the surrender value for the investment products and unearned premium for the risk products.

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QUESTION 5 **(18 Marks)**

Analysis

Component	Aim	KU	SJ	CJ	Total
Part a)	5	6			6
Part b)	5		2	6	8
Part c)	5, 14			4	4
Total		6	2	8	18

Question

The Judicial Manager is concerned with the appropriateness of the investment policy. As Statutory Fund No 1 is investment linked, with published asset allocation ranges for each of the investment options, the Judicial Manager does not believe it is appropriate to consider changing these allocations.

For Statutory Fund No 2 he has provided you with the following asset allocation:

Asset Class	Current Allocation	Benchmark Allocation	Allocation Range
Australian Equity	**22.5%**	**20%**	**15% - 25%**
International Equity	**12.5%**	**10%**	**0% - 20%**
Australian Fixed Interest	**43%**	**55%**	**40% - 70%**
International Fixed Interest	**9%**	**5%**	**0% - 10%**
Property	**10%**	**5%**	**0% -10%**
Cash	**3%**	**5%**	**0%-10%**

The Judicial Manager is now seeking your view on the appropriateness of the investment policy for all funds.

(a) Have you been provided with sufficient information? If not, what additional information would you seek and why? (6 marks)

(b) Comment on the appropriateness of the asset allocation for Statutory Fund No 2 and recommend, with reasons, the need for any changes. Also recommend how these changes, if required, could be implemented. (8 marks)

(c) What are the main considerations regarding the setting of crediting rates for the next 3 to 5 years for the Defined Contribution product? (4 marks)

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QUESTION 5: SOLUTION **(18 marks)**

(a) No I have not been provided with sufficient information. 0.5 mark
An investment policy is more detailed than a set of asset allocation ranges. 0.5 mark.

The additional information that I would seek includes:

- Copy of existing Investment Policy so that I can review it.
- Existing assets to determine credit risk profile, liquidity risk and marketability risk (e.g. are property assets direct property or listed trusts).
- Risk Management Statement to determine policy in relation to derivatives.
- Asset guidelines (e.g. max exposures to single entities, eligible assets to invest in) to determine credit risk policy/profile.
- Investment Policy and assets for the Shareholders' Fund as these have not been provided.
- Asset allocation ranges and product brochures for the Investment Linked product, along with actual allocations to be able to comment on the appropriateness.
- Product brochures for the DC product to see if any specific asset allocation ranges have been promoted for the product.

The above list is not exhaustive. 0.5 mark for each valid additional bit of information and 0.5 mark for why. Max 5 marks. Total marks 6.

(b) Appropriateness

The asset allocation is inappropriate as:

- This Fund has insufficient assets to cover the minimum termination value under the contracts. Any further reductions in asset values due to market fluctuations will only see a further deterioration in this position. The current asset allocation is overweight in these more volatile asset classes, which would be inappropriate in the current circumstances.
- The fund is closed to new business, so the potential for new cash inflows is reduced (only existing premiums and contributions from existing customers). Given the low allocation to cash and the likely increase in surrenders it is likely there would be insufficient cash for liquidity purposes.
- The DC account balances are guaranteed. The current mix with the overweight exposure to the riskier asset classes introduces additional volatility at a time when stability is more important.
- Given the solvency position of the fund and the cash flow position having such a large proportion of the fund in risky assets would now be inappropriate. An asset allocation with less concentration on the more volatile asset classes would improve the solvency position.
- The need to credit interest on a monthly basis to the DC policies would indicate that the investments would be required to provide a stable return if possible. Notwithstanding the current shortage of assets, an allocation with a high level of risky assets would generally provide too volatile a return to fund a regular crediting rate such as this one.

- The exposure to currency risk with international equity and fixed interest adds to the potential volatility. At a time when stability is desired it may be appropriate to reduce this risk.
- The need for caution and stability must be balanced with the need for a competitive earning rate to be declared for the DC product. A sudden reduction in the earning rate would only increase the number of surrender requests creating additional problems. Therefore it is necessary to maintain some exposure to the more volatile asset classes.

1 mark per point for discussing the nature of the appropriateness and the type of change that should be considered. Max of 5 marks.

Revised Asset Allocation

Based on the above comments I would recommend adopting an underweight allocation to equities and property with an increased weighting to cash and fixed interest. I would also recommend reducing the exposure to international asset classes to reduce the currency risk. I would suggest moving to a position along the following lines:

Asset Class	Current Allocation	Revised Allocation
Australian Equity	22.5%	15%
International Equity	12.5%	5%
Australian Fixed Interest	43%	60%
International Fixed Interest	9%	5%
Property	10%	5%
Cash	3%	10%

1 mark for a recommendation, provided it is consistent with the comments made above regarding the appropriateness. 1 bonus mark, if they provide a table illustrating their recommendation.

Implementation of Changes

- Any new contributions and premiums (from existing business) should be directed toward investment in cash and fixed interest assets.
- Assets should be transferred from risky assets as they are realised in the course of trading and used to purchase less risky assets.
- Depending upon the nature of the property (listed trusts versus direct holding) it may be difficult to achieve this reduction.
- Riskier assets should be realised to fund payments where it is possible to do this without further endangering the fund. For example a risky asset at what is considered to be a temporary low value should be held where possible to realise a higher value.

1 mark for each point (unless otherwise specified above) plus any other valid points to a maximum of 2 marks.

(c) The main considerations are:

- The crediting rate policy is usually defined in the policy document. This may be very specific as to the method used to calculate the crediting rate and the discretion that may be used by the company.
- The need to provide a reasonable return on the remaining funds to reduce the withdrawal rate if possible.
- The need to ensure members receive any earnings of the fund, rather than shareholders.
- The change in investment policy for the remaining funds is likely to reduce the earnings, thus increasing the difficulty in maintaining the existing crediting rate into the future. This is exacerbated by the loss of Surplus from the fund.
- At some stage there is likely to be an injection of cash back into the fund once legal proceedings are sorted out. This belongs to the members at the time the monies were removed and needs to be remembered when setting crediting rates to ensure they are not kept too low, thus disadvantaging withdrawing members i.e. equity between remaining and withdrawing policyholders.
- Balancing the ability to improve solvency by declaring slight less than the maximum interest rate with the implications outlined above (legal, withdrawal risk etc)

1 mark for discussion of each point. Maximum of 4 marks.

QUESTION 6 **(24 Marks)**

Analysis

Component	**Aim**	**KU**	**SJ**	**CJ**	**Total**
Part (a)	8, 9, 10		2		2
Part (b)	8, 9, 10		6		6
Part (c)	8, 9, 10		2		2
Part (d)	8, 9, 10		4		4
Part (e)	All			10	10
Total			14	10	24

Question

The Judicial Manager has also requested you to calculate the Value of the In Force business allowing for the potential changes as a result of the directors' actions.

(a) How, and why, would the mortality/morbidity decrement assumptions change for the company from those used at the previous valuation? (2 marks)

(b) How, and why, would the lapse/surrender decrement assumptions change for the company from those used at the previous valuation? (6 marks)

(c) How, and why, would the expense assumptions change for the company from those used at the previous valuation? (2 marks)

(d) How, and why, would the economic assumptions change for the company from those used at the previous valuation? (4 marks)

The Judicial Manager has also requested you to provide some suggestions on other courses of action that should be considered for the company.

(e) What other actions would you recommend the Judicial Manager consider? (10 marks)

INSTITUTE OF ACTUARIES OF AUSTRALIA

COURSE 2A LIFE INSURANCE
MAY 2005 EXAMINATIONS

SOLUTION QUESTION 6 **(24 marks)**

(a) Mortality/Morbidity

- Unlikely to change for the unit-linked product.
- Also unlikely to change for the DC Super product as people will move with employment and be able to obtain a minimum level of cover under the automatic assessment terms of the new employer's scheme. There may be some members who are unable to gain new employment, or are happy to remain with this employer due to illness, but this would be a normal part of the fund's experience and would not be influenced by recent events.
- Unlikely to immediately change for YRT, although if lapse rates do suddenly increase then need to consider the strong possibility of anti selection (healthier lives leave for other companies) leading to deteriorating experience in the future. Would need to reassess during the year.

2 marks – 1 mark for investment products, 1 mark for risk of anti-selection.

(b) Lapses/Withdrawal

If no action is taken to implement a freeze on withdrawals for the investment products, then it is likely to:

- increase greatly for the unit-linked fund as members will move the money they have left to a more secure investment. It is likely the increase would be mainly over the next few months and then return to previous levels.
- increase for the DC Super as the employers in this fund would need/want to arrange for a new scheme to take new members. Existing members are likely to opt for moving to the new schemes as well. Employers may move the existing members to the new scheme as soon as possible also. It would take employers a few months and then there would be the large withdrawals.
- there may also be an increase in the suspension of premiums for many of the existing members as the employers commence a new scheme elsewhere for ongoing contributions for existing members.

1 mark for each valid point, max 3 marks.

If action is taken to implement a freeze on withdrawals (excluding financial hardship) for the investment products, then it is likely to:

- decrease for both investment products as policyholders cannot move their funds unless satisfying hardship and then increase significantly once the freeze is removed from the unit-linked fund as members will move the money they have left to a more secure investment. However, depending upon the outcome by the time the freeze is lifted there may not be any increase in withdrawals.

1 mark

For the risk products, I would expect:

- for the ordinary policies, a significant increase over the next 12 months, as high as 50%, as policies come up for renewal
- for the superannuation products, the change in assumption would be linked to the change made for the defined contribution product as premiums are deducted from the account balance.

1 mark for each point, max 2 marks.

(c) Expense Assumptions

- likely to increase for both products due to the effect of a reducing volume of business on overheads
- no change to the assumptions would be necessary for the cost of the inevitable redundancies in the sales and marketing and other areas. This is because these would be either an acquisition expense or could be treated as a one off expense. However, it would be necessary to ensure that a separate provision had been set up for the one off cost of the redundancies in the balance sheet to ensure that it has been taken into account, and later other areas, of the company.

1 mark for each point, max 2 marks.

(d) Economic Assumptions

For inflation:

- this is based on economic circumstances, which have not changed, so the assumption would remain the same.

1 mark

For interest:

- Alter in alignment with any change in asset mix

1 mark

For Discount Rate:

- need to review existing policy for setting the discount rate but it is likely to be changed to reflect any change in the government bond rate since the previous valuation.
- again depending upon policy it may be necessary to adjust for any change in the asset mix.
- also need to consider an increase in the risk premium given the company’s financial condition.

1 mark per point, maximum of 2 marks, total of 4 marks for this part.

(e) I would recommend that you immediately start a process to try and recover the missing funds. (1 mark) This is unlikely to be resolved quickly as it will no doubt involve some form of legal action or potential insurance claim. (1 mark)

I would also recommend approaching the existing shareholders to see if they wish to provide any additional capital to improve the financial position of the company. (1 mark)

The next thing to address is the immediate cashflow issue. With new business closed and a likely increase in surrenders/lapses it is important to ensure that there is sufficient cash. This is likely to have been partially addressed with the change in investment policy. (1 mark)

The introduction of a temporary freeze on all withdrawals would also assist the cashflow issue. An exception would be for those customers meeting hardship criteria. As there are insufficient assets to support the policyholder account balances, one should not pay these at face values, as it further weakens the position of the remaining policyholders. A reduction of 10% would be appropriate given the overall shortfall in assets. (2 marks)

It is quite likely that the non-super YRT will experience shock lapses (potentially of the order of 50%) over the next 12 months as agents/advisers and Magic's competitors use this opportunity to encourage customers to switch companies. Those healthy lives will have no trouble obtaining replacement cover leaving a greater proportion of sub-standard lives. In order to preserve the maximum potential value that this block represents, it would be advisable to quickly transfer/sell this block to another insurer. (2 marks)

The proceeds from this transfer/sale could be used to restore the financial position of the company. The value of the in force ($200m) could be used to restore the missing funds. Coupled with the release of the solvency requirement from this sale, the company could have sufficient assets to cover the solvency requirement allowing them to apply to take back over the management of the company. The company may even have sufficient assets to continue writing new business. (2 marks)

Whilst it may be possible that the company could again one day write new business, it may not be for some time. Hence, it would be necessary to determine which areas will have significantly less volumes of work and whether a redundancy program be initiated. Areas to consider include underwriting, new business administration, sales, sales support and marketing. (1 mark for considering redundancy program, 1 mark for covering areas of the business)

It is also worth considering having you (the Judicial Manager) make some presentations to the larger DC groups to ensure their ongoing contributions/leaving their accounts with the company. (1 mark)

Max 10 marks. Markers to use own judgement for other appropriate points made (either 1 or 2 marks).

END OF PAPER