INSTITUTE OF ACTUARIES OF AUSTRALIA

LIFE INSURANCE **2003 EXAMINATIONS**
PAPER TWO

Answer all 5 questions.

QUESTION 1 **(23 marks)**

You are the valuation actuary of a medium sized Australian life insurer that specialises in risk products. You have recently recruited a new graduate who has limited experience in valuing income protection products. He has calculated the best estimate liability for the income protection portfolio for the currently disabled lives (claims in course of payment).

(a) Outline the checks that you would conduct on the results of his calculation and state what these checks might indicate. (15 marks)

(b) Identify the key risks to the adequacy of the reserve that has been established for the income protection claims in course of payment, and outline risk mitigation strategies for each of those risks. (8 marks)

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QUESTION 2 **(22 marks)**

You are part of a product development team that is developing a specification for a new unit linked savings product that will be sold through your company's existing agency distribution channels. The product will be offered as both ordinary and superannuation business and includes the following investment options:

- Capital Guaranteed
- Capital Secure
- Balanced
- Growth

Each of the unit-linked options will offer a guarantee of return of premiums as a minimum surrender value after ten years.

The specification is now at the stage of describing the charges to be levied on the product.

(a) Identify the various initial and ongoing costs (expenses and commission) that would be expected to be incurred on this product. (5 marks)

(b) Suggest ways in which charges may be levied on the product to cover these costs. (4 marks)

(c) Given that this is a new product line for the company, outline how you would determine the expense assumptions to be included in the product model to be used in profit testing. (5 marks)

(d) What differences between superannuation and ordinary business would you need to consider when pricing the product? (5 marks)

(e) What is the effect of including the guarantee of return of premiums as a minimum surrender value? (3 marks)

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QUESTION 3 **(20 marks)**

A product actuary has been seconded from your company's US affiliate office and has joined your team. He has prepared a paper on the current state of the individual term life market and recommended that your company develop a range of 'preferred life' products where lower premiums are offered on policies where the life insured meets stricter underwriting requirements.

He has argued that this would be a market leading strategy for your office that would allow it to increase its market share and profitability at the same time whilst also gaining good media exposure.

(a) What changes to the company's underwriting guidelines would be required to support the proposed 'preferred life' product? (5 marks)

(b) What would be the possible implications to the company of introducing a preferred life product into the Australian market? (15 marks)

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QUESTION 4 **(25 marks)**

You are the Appointed Actuary for a newly established life insurance company in Australia about to calculate the policy liability for its first year-end. The company has issued only one product in its first year of business, namely an allocated pension product (with only one investment option). The product has two charging structures:

	Charging Basis 1	Charging Basis 2
Entry Fee	3%	0%
Management Fee (p.a.)	1.5%	2.0%
Exit Fee	Nil	Nil

At the end of company's first year of business the following information has been extracted from the general ledger, administration system and valuation systems:

Premiums	\$100.0m
Pensions Payments Paid	\$3.0m
Surrenders Paid	\$1.94m
Policyholder Investment Income	\$5.78m
Shareholder Investment Income	\$2.0m
Acquisition Expenses	\$3.5m
Maintenance Expenses	\$2.0m
Tax Expense	- \$0.423m (i.e. a refund)
Entry Fees	\$1.2m
Management Fees	\$0.89m

	Charging Basis 1	Charging Basis 2	Total
Inforce Units at year-end	35.15m	54.50m	
Unit Price at year-end	1.1050	1.0992	
PV Charges @ Inception	\$5.8m	\$12.0m	\$17.8m
PV Profit @ Inception	- \$0.31m	\$0.2m	- \$0.11m
PV Charges @ Year End	\$5.5m	\$11.4m	\$16.9m
PV Profit @ Year End	\$0.4m	\$0.9m	\$1.3m

(Where PV is an abbreviation for present value)

The recently hired Chief Financial Officer (CFO), having been hired from a well established life office, expresses some surprise when he hears of your plan to use the accumulation method instead of a projection method to calculate the policy liability.

(a) Briefly explain the difference between the projection method and the accumulation method. (2 marks)

(b) Justify your decision to use the accumulation method. (3 marks)

(c) The CFO also wants to know why you consider it appropriate to treat this as a single related product group. Justify your decision. (1 mark)

(d) Using the accumulation method, calculate the policy liability at the end of the first year of business. (9 marks)

(e) Calculate the profit the company made for the first year. (4 marks)

(f) The CFO is still concerned that the auditors will not sign off the accounts without an analysis of profit and he does not believe that an analysis of profit can be performed as a projection method was not used. Draft a response to address his concerns including how (using the information provided) you did analyse the profit and thus ensured that the policy liability was reasonable. (6 marks)

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QUESTION 5 **(10 marks)**

You are the actuary of a life insurance company operating in a developing nation. The legislative and regulatory environment in place for the life insurance industry is modelled on the Australian environment and is very similar in all respects. The company offers only traditional products (participating and non-participating). The asset mix supporting the liabilities is as follows:

Domestic Equity	30%
International Equity	20%
Property	10%
Fixed Interest	25%
Cash	15%

The investment performance over recent years is similar to the Australian market (several years of strong gains followed by several years of weak performance).

(a) Briefly discuss the criteria for a satisfactory surplus distribution method. (2.5 marks)

(b) Discuss 2 methods of distributing capital appreciation and how each of these methods would have fared given the investment performance experienced over recent years. (2.5 marks)

(c) One of the Directors suggests that during these uncertain times (war, SARS virus, volatile markets) the assets should be invested in cash in a safe-haven such as Australia, and has asked for your written advice on his proposal. Briefly outline the points that you would consider in providing your advice. (5 marks)

END OF PAPER TWO