COURSE 2A LIFE INSURANCE **MAY 2013 EXAMINATIONS**

Answer two questions.

QUESTION 1 **(30 MARKS)**

You are the Chief Actuary of Examlife, a medium sized life insurance company in Examland. It writes a full range of products.

Examlife has been well known, for many years, for its very conservative investment strategy. It has recently been acquired by an aggressive fund manager. The new management has decided to make material changes to Examland's investment strategy.

In a memo to you, the new CEO has asked for the following advice:

"Our intention is to use the asset allocations for each of our product liabilities as a source of profit not just as a minimizer of risk. Please provide me with your recommendations as to the asset allocations which will provide the optimum profit. The risk involved from asset value fluctuations should be a part of your advice."

a) Set out your recommended asset allocations for each product, showing your reasons in full. (20 Marks)

b) Discuss the risk involved from asset value fluctuations for each product's asset allocation. (10 Marks)

The following spreadsheets are attached:

1. C2A_LAQ_1_Examlife Product Liabilities.xlsx
2. C2A_LAQ_1_Australian Investment Data.xlsx

Note that for the purposes of the question only the asset classes shown in the Australian Investment Data spreadsheet are allowed.

Examlife Product Liabilities as at December 2012

Product	**Policy Liability**	**Minimum Regulatory Capital Required**	**Actual Capital Allocated**
	$ million	$ million	$ million
10 year Level Term	805	50	60
Yearly Renewable Term	345	12	18
Disability Income Active Lives	675	120	135
Disability Income Outstanding Claims	413	85	100
Participating WoL	349	35	42
Investment Linked - Balanced	1,698	4	5
Investment Linked - Capital Secure	2,314	6	7
TOTAL	**6,599**	**312**	**367**

The Disability Income product has the following key characteristics:

- Premiums are 10 year level
- All benefit payments are inflation indexed subject to a maximum of 4% p.a.

MARKING GUIDE: QUESTION 1

Overall Considerations

A key consideration in this question is the requirement to make profit from asset allocations. To gain high marks students need to recognize this. T is likely to lead to asset allocations which are not matched to the liability characteristics. In respect to Investment Linked it is, of course, the customer who retains all the investment earnings. This makes it unlikely that the company can make additional profit from asset allocations. To gain high marks students need to also recognize this.

Part A: 20 Marks

In this part marks are allocated according to the matrix below. The matrix has two components for each band of marks: the quality of the answer for each product and the number of products which fit the relevant quality.

The intention is to mark holistically across these two axes.

As an example:

Student has top quality band for 3 products but only second quality band for the other 4 products. A mark in the middle of the top part of the second band overall would be a reasonable result.

% of Maximum Marks	Quality Requirement
75% - 100%	Investment strategy which maximizes profit; takes account of the key product characteristics; recommendations follow logically & clearly from reasons.
50% - 74%	Investment strategy is adequate but profit maximization is not central; does not fully connect with product characteristics; recommendations connect with reasons but there are gaps.
25 – 49%	Investment strategy is poor; product characteristics have inadequate impact; reasons are not clear or logical.
<25%	Little of relevance

% of Maximum Marks	Number of Products Requirement
75% - 100%	All products
50% - 74%	4 or more products
25 – 49%	2 or more products
<25%	Little of relevance

Part B: 10 Marks

The same approach as for part A is used here.

Note that no numbers are required in this part – it is only discussion.

% of Maximum Marks	Quality Requirement
75% - 100%	The risks from asset value fluctuations make good sense and are clearly described.
50% - 74%	The risks from asset value fluctuations make reasonable sense and are adequately described.
25 – 49%	The risks from asset value fluctuations make some sense and are described but are not convincing.
<25%	Little of relevance

% of Maximum Marks	Number of Products Requirement
75% - 100%	All products
50% - 74%	4 or more products
25 – 49%	2 or more products
<25%	Little of relevance

COURSE 2A LIFE INSURANCE MAY 2013 EXAMINATIONS

QUESTION 2 **(30 MARKS)**

You are the Actuary in a small Australian life insurance company. Being in a small company, your role covers all aspects of the actuarial function, including the Appointed Actuary and Product Actuary roles.

Your company sells, amongst other things, niche products for celebrities. Having been inspired by a recent deluge of direct mail offerings for funeral insurance from other insurers, the Product Manager at your company has proposed a funeral insurance product targeted at celebrities – "Celebrity Funeral Insurance". The Product Manager has been speaking with a particular funeral provider which has expressed an interest in entering into an alliance with your company. The proposal is as follows:

Product design:

- Level premiums are payable to age 90, and cover continues for free thereafter.
- Guaranteed acceptance: no underwriting at point of sale, but the death benefit is only payable on accidental death in the first policy year. The death benefit is payable on death from any cause from the second policy year onwards.
- On receiving satisfactory evidence of the death (or accidental death, if within the first policy year) of a life insured, your company will pay a lump sum to the funeral provider who will then take care of all the funeral arrangements. A referral fee is payable by the funeral provider to your company for each claim referred.
- The amount of the lump sum will be equal to cost of the funeral provider's top-of-the-range "Ultimate Deluxe" package, which, according to the funeral provider, will more than satisfy even the most discerning celebrity.
- The product will be sold through your company's existing adviser channel, as some of these advisers already have established relationships with celebrity agents and have been selling other life insurance products to celebrities in the past. Upfront and renewal commission will be payable at the same rate as what is currently paid on your company's existing "Celebrity Yearly Renewable Term – Death & TPD" product.
- Surrender and paid-up values are applicable after a policy has been in-force for three years. The basis is the minimum surrender value and minimum paid-up value as specified in LPS 360.

a) The CEO has asked for your initial comments on the proposal. In particular, she is questioning the need for surrender and paid-up values as none of the other level premium funeral insurance products on the market have this feature, and she is concerned that including it would make this product too expensive. Also, if surrender and paid-up values are payable, why would they only be applicable after three years?

   Draft your response, which should include:

   - your views on the general product design,
   - addressing the CEO's questions regarding surrender and paid-up values, and
   - identify any recommended changes to the product design.

(15 Marks)

b) Some time later, the product design and pricing have been finalised and, after receiving LPS 320 product advice from you, the Board has approved the "Celebrity Funeral Insurance" product.

You have decided that your mortality assumptions will be equal to the rates in the attached mortality tables.

Moving into the implementation stage, it is your responsibility to help out with some of the technical aspects of product implementation, such as how surrender values should be administered on the system. After some discussions with IT, it was agreed that you would provide samples of surrender values. These sample surrender values would be expressed as a surrender value per $1,000 of current sum insured, by age at entry and policy duration (in years). The sample set will show values for females only for ages at entry 50 to 59 and policy durations of 1 to 10. Only integer parameters will be shown.

Using Excel, build the surrender value sample values. Assume that policies will be sold as Ordinary non-participating business only. (15 Marks)

The following spreadsheet is attached:

1. C2A_LAQ_2_IA_90-92.xlsx

*You MUST submit both your Word document AND your Excel file.

MARKING GUIDE: QUESTION 2

Part A: 15 Marks

General product design

- The need for this product at all, given the existence of "Celebrity Yearly Renewable Term – Death & TPD";
- Lump sum benefit being the cost of the funeral provider's top package - insurer loses control of the amount on risk as the funeral provider can set the cost to whatever they want;
- Free cover after age 90 introduces a savings component;
- Guaranteed acceptance with one year accidental death qualifying period is acceptable for existing funeral insurance products as they tend to have low sums insured. The celebrity product could have significantly higher sums insured and this design may not be appropriate for high sums insured;
- The benefit relies on the existence and continued good reputation of the funeral provider and therefore introduces counterparty risk;
- The design of the referral fee is important as it should preferably be linked to the size of the benefit amount. For example, the life insurer would not want to be locked into a fixed dollar fee when the funeral provider can charge whatever they want for the top package;
- Adviser commission – if the guaranteed acceptance model is used, then there should be less work for advisers as there are no underwriting requirements, so it may be inappropriate for upfront commission to be the same as for an underwritten product.

Need for surrender and paid-up values

- The principle behind surrender values is to return any savings component, less expenses, to the owner of a surrendered policy. The combination of level premium and premiums ceasing at age 90 implies a savings component which could be non-trivial, so a surrender value could be appropriate, particularly for the older ages.
- No surrender values are payable on existing funeral insurance products due to those products falling under the definition of "funeral bond business" as defined in LPS 001. One of the criteria for funeral bond business is that the sum insured is no greater than $15,000. The cost of the "Ultimate Deluxe" package is unspecified but is likely to be more than $15,000, so the product fails the definition of funeral bond business;
- As the product fails the definition of funeral bond business, it falls instead under the definition of traditional business. Minimum surrender values and paid-up values are required under LPS 360 for traditional business.

Why no surrender and paid-up values for the first 3 years

- There is no regulatory minimum surrender value under LPS 360 for regular premium business in force for less than 3 years;

- As the principle behind surrender values is to return the savings component of premiums, less expenses, the 3 year requirement is in recognition that it generally takes about that much time for life insurers to recover acquisition expenses.

Recommended changes to product design

- The benefit amount needs to be specified in order for the insurer to know the amount on risk. A specified sum insured is also required for premiums to be calculated. It is fine to link the benefit to the cost of the funeral provider's "Ultimate Deluxe" package but the insurer should negotiate a fixed price. The price (and therefore sum insured) can be linked to a specified inflation index if required;
- The referral fee payable by the funeral provider should be expressed as a percentage of the benefit amount rather than a fixed fee.
- Assuming the sum insured is large (eg Michael Jackson's funeral cost over $1m), a guaranteed acceptance product with 1 year accidental death only qualifying period may not be appropriate. If guaranteed acceptance is important for marketing purposes, one option would be to extend the accidental death period (say to 2 years). Otherwise, underwriting requirements should be introduced to limit anti-selection risk.
- To address counterparty risk, the insurer needs to check to see if other funeral providers offer a comparable funeral package so that alternate arrangements can be made in the event that the current funeral provider becomes unsuitable for any reason.
- The commission structure should be reviewed to better reflect the amount of effort required from advisers for this product compared to "Celebrity Yearly Renewable Term".

% of Maximum Marks	Requirement
75% - 100%	Clear explanations in non-technical language appropriate for replying to the CEO. Well-reasoned comments on all the product features and their implications, as well as recommended changes to the product design. Recognising that the product fails to meet the definition of Funeral Bond Business and that it falls under Traditional Business. Recognising the existence of and the reason for the 3 year rule for surrender values.
50% - 74%	Comments on the product features, their implications and recommended product changes, with some gaps. Less well-reasoned comments in relation of the CEO's specific questions on surrender values.
25 – 49%	Failure to recognise many key points; reasons are not clear or logical.
<25%	Little of relevance

Part B: 15 Marks

Students are expected to build a spreadsheet that incorporates the requirements of LPS 360 for traditional business in order to create a table of surrender values. Carry through errors should only be penalised once. Required features of the spreadsheet:

- Age at entry as a parameter;
- Policy duration (years) as a parameter;
- Gender can be parameterised but should be pointing to female qx rates;
- Use of parameters as prescribed in Attachment 1 Part IV of LPS 360:
  - Interest rate = 70% x 9.25% = 6.475%
  - IA 90-92 mortality
  - 1.5 year Sprague adjustment
  - Factor = 88%
- Calculation of assurance factor;
- Calculation of annuity factor;
- Calculation of net premium (NP);
- Application of formula from Attachment 2 Part II of LPS 360 to calculate minimum termination values for females with age at entry from 50 to 59 and policy durations 1 to 10.

% of Maximum Marks	Requirement
75% - 100%	All requirements allowed for correctly. Calculations are "correct".
50% - 74%	Most requirements allowed for. Calculations are acceptable.
25 – 49%	Some requirements allowed for. Calculations are doubtful.
<25%	Little of relevance

END OF PAPER