EXAMINATIONS

April 1999

Subject 402 — UK Fellowship Life Insurance

Paper One

EXAMINERS' REPORT

In general the bookwork questions were answered well, while those that required significant development of standard processes to meet particular situations were poorly answered. Particular comments on each question are in italics at the end of each solution.

1 (i) In a linked fund only assets which are defined as permitted links may be held. It is illegal to hold other types of asset. In a non-linked fund those types of asset for which a valuation method is not prescribed in the Regulations must be taken at zero value.

There are no constraints on the valuation method used for linked assets.
However linked assets in excess of those needed to match exactly associated linked liabilities (referred to as "surplus units") are treated as non-linked assets with regard to both valuation method and admissibility limits.

There are no limits on concentration of risk for linked assets. Provided the asset is a permitted link, any amount of any asset may be held in a linked fund. (Subject to the previous point) For non-linked assets the Regulations prescribe how much of any particular asset may be admissible depending on the type of asset. These admissibility limits are expressed as percentages of the long term business amount, which is essentially the total non-linked liabilities (including current liabilities) plus part of the solvency margin.

(ii)

Asset Type	Valuation Method
Securities listed on stock exchange in EEA state or on a regulated market	Market value
Authorised Unit Trusts	Bid (selling) price of units.
Debts	If due or repayable at option of lender within 12 months, at face value, subject to reasonable probability of recovery. Otherwise the amount which would be paid for immediate assignment of debt.
Policy Loans	At face value provided this is less than the policy surrender value.
Unlisted shares	Market value
Land	As valued by a qualified valuer on an open market sale basis within last three years less cost of sale.

Computer equipment	Amortised over four years on straight line basis
Other equipment	Amortised over two years on straight line basis.
Derivatives	Market value if listed. Otherwise the amount which might be paid to close out the contract
Dependents	In effect on a look through basis as if the assets and liabilities were directly held by the insurance company.

Part (i) was intended to elicit the differences in the treatment of linked and non-linked assets. Part (ii) was bookwork and generally well answered.

2 (i) The Treasury have the power to intervene in the running of the company if they believe policyholders' reasonable expectations (PRE) will not be met. (ICA 1982). At the highest level policyholders have an expectation that the company will still be solvent when it comes for them to make a claim. Thus a full statutory solvency valuation would be carried out.

The valuation of liabilities regulations (ICR 1994) require due regard to be paid to PRE. GN8 interprets this to mean that the statutory valuation should be sufficiently strong to enable an appropriate level of reversionary bonus to emerge, but not as requiring implicit or explicit provision for terminal bonus.

The Appointed Actuary would be expected to make other investigations in order to be satisfied that the life fund is able to support a proper level of terminal bonus having regard to the bonus smoothing policy of the company.

As part of the statutory solvency valuation, resilience reserves will be calculated. The company is likely to wish to be able to withstand a more severe change in investment conditions than required for a solvency valuation, and calculation on the more severe basis will be needed.Consequently, it is likely that constraints imposed on the non-linked investment policy will need to be tightened. This will involve a lower exposure to more volatile equity-type assets.

Less volatile assets generate lower overall returns which will in due course feed into asset shares, and thus policy payouts. PRE of policy payouts may thus be reduced. However the reduction will be gradual and can be managed.

It may be necessary to adjust the RB/TB proportion or switch to super compound RB

Changes to the With Profit Guide and comments sent to clients with bonus notifications help to manage expectations downwards.

The other investigations referred to in GN8 primarily include a calculation of aggregate accumulated asset shares. It is acceptable that the difference between accumulated asset shares and the statutory valuation liability is covered by the total of the solvency margin and the excess assets.

If the accumulated asset shares plus without profit liabilities exceed the value of assets, capital to support the business needs to be found quickly.

Possibilities are: Financial Reassurance
Issue of subordinated debt
Securitisation of future profits
Demutualisation
Merger

The statutory solvency position and the accumulated asset shares need to be projected forward for a number of years, either stochasticly or deterministicly, using a range of assumptions for economic factors, new business volumes, expenses, mortality, inflation, etc.

These may reveal the need to limit new business capital requirements. This may be achieved by:

Reassuring non-linked business
Redesigning linked contracts so that they return capital sums quickly (e.g. by using nil allocation periods)
A limit on volumes written
A temporary or permanent closure to new business.

Limiting volumes of business processed will have an adverse effect on expenses as economies of scale are lost. This reduces profitability of non profit business and asset shares of with profit business.

For linked business the increased expenses may indicate a need to review variable charges. Policyholders have expectations of such reviews based on past practice and references made in contract literature.

(ii) If 80% of the new business is linked, but only half the liabilities, then the with profits business is likely to be relatively mature. The directors' suggestion would then succeed in rebuilding capital quickly with minimal adverse effects on future new business.

An immediate fall in policy payouts, unrelated to falls in investments markets, is likely to be contrary to the expectations built up by policyholders (PRE) PRE will have been communicated in published literature and will have been influenced by past actions.

If with profits policyholders have in the past benefited from profits from surrenders and non profit business, these could now be used to rebuild capital. The With Profit Guide would need amending to reflect this change in policy.

There is, however, no reason why an additional charge cannot be levied on asset shares to build up capital. This can be done by taking a deduction from the investment return. It will build up capital more slowly than immediate reductions in claim values.

It may be reasonable for unit-linked policyholder members to bear an additional charge, perhaps by increasing the annual fund management charge. However, this would depend on the expectations built up as to the conditions which might result in variable charges being increased. Consequently, the scenario may not be reasonable. This would impact on new business projected figures and possibly new business volumes. Which may not necessarily be a bad thing if capital is limited.

There are other ways of regenerating a capital base, such as financial reassurance. This can provide additional capital quickly by mortgaging future profits.

This question was very poorly answered, even by successful candidates. The intention was for candidates to extrapolate from legislative requirements to a real, and common, situation. Most candidates rehearsed the contents of guidance notes without applying them to the company's situation, and gained few marks for doing so.

3 Future investment conditions
Levels of new business
Expenses
Persistency
Allocations of profits
Mortality
Morbidity
Taxation
Exercising of options by policyholders
Exercising of options by the company
Effect of asset defaults
Unit pricing bases
Risk of reinsurer default

Straightforward book and well answered. Too many candidates wasted time by writing more than a simple list.

4 (i) The reserve needs to be split into a unit reserve and a non-unit reserve.

Unit reserve = $\sum$ (no. of units per payment) $\times \overset{\circ}{e}_x \times$ (unit price)

where $\overset{\circ}{e}_x$ is the complete expectation of life on the valuation basis.

There may also need to be an additional reserve for improving mortality.

The unit price is the bare price with no adjustment for buying or selling costs.

Non-unit reserve needs to be calculated on a cash-flow basis so as to eliminate any future negative non-unit cash-flows. For each contract, project future charges and expenses, and calculate reserve required now so that no future cash strains arise.

Consider need for deficit reserve if any guarantees given.

(ii)

Mortality	analyse recent experience allowance for future improvement based on recent experience + margin for additional improvement, unless separate reserve held possibly PMA/PFA (c=2020)
Expenses	analyse recent experience of administration and payment expenses probably consistent with charges but not necessarily identical (could be lower or higher)
Unit growth	depends on assets in each fund not overestimate as would inflate charges may use separate rates for different asset types use 4.5–5% for gilts 7–7.5% for equities
Inflation	consistent with average unit growth rates May need different assumption for growth of charges and expenses as charges may be linked to RPI, expenses to AEI use RPI 2.5–3%, AEI 1% higher
Non-unit interest rate	consider asset backing probably use gilt interest rate
Tax	no allowance as pensions business

This question dealt with a unit-linked annuity, which is not currently a common concept in the U.K.

Good marks could be obtained even by candidates who did not understand how the contract worked, but too many made unnecessary errors, such as, for example, quoting assurance mortality tables.

5 (i) The two methods essentially try to do the same thing. The formulae are derived by stepping through simple projections, swapping actual for expected in going from one formula to the next. This is exactly what the non formula approach does.

Different formulae would be derived if the analysis was performed in a different order.

The difference comes about from the practical details. The advantage of the formula approach is its simplicity, but it is applied in a fairly broadbrush way.

The non-formula approach will probably be carried out on the company's model office system, which will allow for the items of cash flow in a much more sophisticated way. For example, rather than assume all cashflows take place mid-year, it will be able to allow for a more correct timing for items such as premiums.

(ii)
Investment:	(V0-act_exp+p)*no_pols*(act_i-i)
Expenses:	no_pols*(re-act_exp)*(1+i)
Mortality:	(no_pols*qx-no_deaths)*(sa-V1)

Marks were awarded for defining all the terms.

(iii) reserve at 31/3/97 = 1000*7866.736 = 7,866,736
assets at 31/3/97 = 7,866,736
reserve at 31/3/98 = (1000 - 157)* 7969.55012 = 6,718,330.75
assets at 31/3/98 = 7,077,274.88
SURPLUS = 7,077,274.88 - 6,718,330.75 = **358,944.13**

Investment = (7866.736 - 12 + 152) * 1000 * (0.08 - 0.05) = 240,202.08
Expenses = 1000 * (10 - 12) * 1.05 = -2100
Mortality = (216.51335 - 157) * (10000 - 7969.55012) = 120,838.88
Sum = 358,940.96
error = 3.17 which is well within acceptable limits

(iv) Expenses: no_pols*(re-act_exp)*(1+act_i)
Mortality: (no_pols*qx-no_deaths)*(sa-V1)
Investment: (V0-re+p)*no_pols*(act_i-i)

Expenses = 1000 * (10 - 12) * 1.08 = -2160
Mortality = (216.51335 - 157) * (10000 - 7969.55012) = 120,838.88
Investment = (7866.736 - 10 + 152) * 1000 * (0.08 - 0.05) = 240,262.08
Sum = 358,940.96
error = 3.17

Many candidates were clearly surprised and terrified by a numerical question. Considerable marks could be gained even without success in the arithmetic.

6 The maximum that the company would want to pay out is the smoothed asset share of the policy, otherwise the company/remaining policyholders would be losing out.

To satisfy policyholders' expectations the surrender value should be at least as much as premiums paid as soon as possible, taking into account the illustrations given at the point of sale. The basis should be fair to both the policyholders surrendering and to those retaining their policies. Therefore the smoothing of asset shares used in the calculation above should be consistent with the normal company policy. There may be a practice to penalise early leavers to the benefit of the fund or clients remaining. Marketing conditions have to be taken into account.

As the policy approaches maturity then the surrender value should approach the maturity value.

For ease of administration the calculation should be fairly straightforward. The basis should not have to be reviewed frequently. The surrender value basis should have due regard to competition. This is particularly true due to the fact that in the UK the surrender value in the first five years is published at the point of sale.

Regard should be had to statements made in marketing literature.

A standard question which was well answered.

7 (i) To support writing new business, especially capital intensive business, including establishing the solvency margin.

To enable a freer (less closely matched) investment policy and to smooth investment returns and therefore payouts.

To smooth other experience items.

To buy other life insurance operations.

To diversify into other financial services operations.
To invest in its own business e.g. through developing computer systems

(ii) The main supervisory valuation tests for a minimum of capital (the RMM) and a minimum guaranteed fund. The RMM is based partly on capital at risk and partly on liabilities, the rate depending on the extent of investment and expense guarantees

Both the assets and the liabilities are valued with margins, whilst futurebonuses are ignored. The valuation also tests for resilience to certain deterministic changes in the economic conditions

Part of the RMM may be covered by implicit items: hidden reserves, future profits, zillmerisation.

The Financial Condition Report may include a true determination of capital.

The U.K. system relies on a certificate from the Appointed Actuary as to the amount of liabilities and the RMM.

(iii) Business already in force, or expired, may have generated capital through under-distribution of surplus to those generations of policyholders. This has been the largest single source of capital in the past, but it would be difficult or impossible to under-distribute on the same scale in the future.

New business may be sold on a bonus philosophy that includes withholding some surplus in order to build capital. Whether a company can do this depends on its competitive situation (e.g. IFA or tied distribution) and on acceptance of a reduced prospective return by new policyholders.

The usual bonus structures (specifically terminal bonuses) create temporary working capital, provided by each generation of policyholders while their policies are in force. This capital can be used on a revolving basis, e.g. to increase investment freedom but it cannot be permanently "spent", because it forms part of asset shares and must eventually be returned to the policyholders. This will all be constrained by Policyholders' Reasonable Expectations and what has been said in policy literature and With Profits Guides about bonus philosophy

(iv) The free assets are usually expressed net of the required minimum margin, but the RMM actually forms part of the capital.

The valuation of assets includes prudent margins, e.g. limits on asset concentration, disregard of inadmissible assets. The valuation of liabilities also includes margins, e.g. restrictions on assumed yields, disregard of future dividend/rental growth, expenses of closure to new business. On the other hand, future bonuses are not valued, so part of

the free assets generally "belongs" to with profits policyholders through asset shares.

The resilience tests may cause an additional reserve to be held, which reduces the free assets.

This question was not well answered. Unsuccessful candidates strayed from the approach indicated by the question. Attention to the mark allocation for each part gives an indication of the scale of response the examiners were expecting

8 Investment returns

The investment returns generated by the with profits fund, both actual and prospective, will influence the level of the accumulation rate because the life company will not wish to distribute more than it is earning and therefore, the lower the investment return, the lower the accumulation rate.

Guaranteed rates

The level of any guaranteed rate, and the investment constraints implied by it is important. Bonus interest can only be declared on top of the guaranteed rate.

Asset distribution

The higher the proportion of the with profits fund invested in equities, the riskier the investment strategy. Hence, the company is more likely to declare a low accumulation rate to allow a cushion of accrued terminal bonus to accumulate which can then absorb adverse asset movements. Alternatively the company could be a high accumulation rate and frequent application of an MVA to achieve the same effect.

Level of investment income

Investment income is more suited than capital appreciation to be distributed through the accumulation rate, because of the latter's volatility. Thus, investing in assets with high income yields is likely to result in a higher accumulation rate.

Bonus philosophy

The life company will have developed a particular approach to distributing surplus under its with profits policies, in particular the split between the accumulation rate and terminal bonus and its policy on smoothing it will not wish to depart from this without good reason.

Free assets

The greater the company's free assets, the less need it will have to boost those assets by holding back surplus. Hence, it may declare a higher accumulation rate.

Policyholders' reasonable expectations

Policyholders will have expectations concerning the level of the accumulation rate. These will have arisen from literature provided by the life company, both at the point of sale and subsequently. They will also be influenced by past practice and the levels generally available in the market.

Competition

The company will not wish to declare an accumulation rate too far out of line with competitors.

Successful candidates had few problems with this question. Unsuccessful candidates simply didn't cover enough ground.