

Subject ST2
Life Insurance
Specialist Technical

Syllabus

for the 2008 Examinations

1 June 2007

**The Faculty of Actuaries and
Institute of Actuaries**

Subject ST2 — Life Insurance Specialist Technical Syllabus

Aim

The aim of the Life Insurance Specialist Technical subject is to instil in successful candidates principles of actuarial planning and control, and mathematical and economic techniques, relevant to life insurance companies. The student should gain the ability to apply the knowledge and understanding, in simple situations, to the operation, on sound financial lines, of life insurance companies. The life insurance products covered by this subject exclude health and care insurance products covered by the Health and Care Specialist Technical subject.

Links to other subjects

Subject CT5 — Contingencies: introduces techniques that will be drawn upon and developed by this subject.

Subject CA1 — Core Application Concepts: covers the general underlying principles affecting all specialisms.

Subject SA2 — Life Insurance Specialist Applications: will use the principles and techniques in this, and the earlier subjects, to solve life insurance problems within a specifically United Kingdom context.

Objectives

On completion of this subject the candidate will be able to:

- (a) Define the principal terms used in life insurance.
- (b) Describe the main types of life insurance products in terms of:
 - the needs of consumers versus the objectives of the insurer
 - the benefits, guarantees, and options that may be provided
 - the main types of products issued
 - the purpose of the products for the insurer
 - the purpose of the products for the insured
 - the benefits, and the financial and other risks (including capital requirements), associated with these products to the insurer
 - the benefits and risks of the products to the insured

The products under this syllabus objective may provide benefits of the following types:

- single, or periodic, payments from the date of death
- single, or periodic, payments on survival to a specified point in time
- periodic payments on continued survival

and the products may be written on the following bases:

- single or regular premium
 - without profits non-linked
 - unit-linked
 - index-linked
 - with profits
 - single, joint, or group life basis
 - with or without conversion options and options to change the level of benefits provided
- (c) Describe the following methods of distributing profits to with profits policyholders:
- cash bonus
 - premium reduction
 - benefit increase
 - “additions to benefits” method
 - “revalorisation” method
 - “contribution” method
- (d) Describe the technique of asset shares, explain how an asset share may be built up using a recursive formula, and explain the main uses of asset shares.
- (e) Describe the effect of the general business environment, including the impact on level of risk to the insurer, in terms of:
- propensity of consumers to purchase products
 - methods of sale
 - remuneration of sales channels
 - types of expenses and commissions including influence of inflation
 - economic environment (including developing / volatile economies and risky markets)
 - legal environment
 - regulatory constraints and opportunities
 - fiscal constraints and opportunities
 - professional guidance constraints and opportunities
- (f) Discuss how the following can be a source of risk to a life insurance company:
- policy and other data
 - mortality rates
 - investment performance
 - expenses, including the effect of inflation
 - withdrawals
 - mix of new business by nature and size of contract, and by source
 - volume of new business

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- guarantees and options
 - competition
 - actions of the board of directors or staff
 - failure of appropriate management systems and controls
 - counterparties under reinsurance arrangements
 - legal, regulatory, and fiscal developments
 - fraud
 - aggregation and concentration of risk including credit failure
- (g) Describe the roles of reinsurance and underwriting, including the managing of risk.
- (h) Discuss further ways of managing the risks in (f) above:
- policy data checks
 - choice of with profits bonus method
 - capital management
 - asset-liability matching
 - expense control
 - policy retention activity
 - management of new business mix and volumes
 - management of options
 - systematic risk assessment and management strategies
- (i) Describe the use of actuarial models, including stochastic models and Monte Carlo simulation, for decision making purposes in life insurance in terms of:
- the objectives of, and requirements for, building a model for the management of life insurance products
 - the basic features of a model required to project life insurance business
 - choosing between formula and cashflow approaches
 - choosing between stochastic and deterministic approaches
 - the differences between traditional and financial economic approaches
 - the use of sensitivity analysis or the assessment of variances
 - the use of models for:
 - pricing
 - assessing the return on capital
 - assessing the profitability of existing business
 - developing an appropriate investment strategy
 - projecting future supervisory solvency position
- (j) Describe the technique of actuarial funding in the context of unit-linked life insurance contracts.

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- (k) Evaluate the cost of guarantees and options.
- Describe the use of stochastic simulation or the use of option prices to calculate the cost of an investment guarantee.
 - Calculate the cost of a simple mortality option using the conventional method and the North American method.
- (l) Calculate the benefits on the early termination of a contract, including transfer, and the premium or benefits after a change in the terms of a contract.
- Calculate surrender values for conventional insurance contracts using reserves.
 - Calculate paid-up sums assured for conventional insurance contracts using reserves.
 - Use reserves to evaluate the financial effect of alterations to policies.
- (m) Describe the factors to consider in determining a suitable design, in terms of benefits and charges, for a life insurance product.
- (n) Describe the principles of setting assumptions for pricing and valuing life insurance contracts, having regard to the management of risk and the return on capital, including how assumptions can be a source of risk.
- (o) Describe how supervisory reserves may be determined for a life insurance company in terms of:
- the principles of setting supervisory reserves
 - the reasons why the assumptions used may be different from those used in pricing
 - the use of a Zillmer adjustment
 - allowing for future bonuses on with profits contracts
 - the use of sensitivity analysis
 - the interplay between the strength of the supervisory reserves and the level of solvency capital required
- (p) Describe the principles of investment.

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- (q) Describe how the actual experience of a life insurance company should be monitored and assessed in terms of:
- the reasons for monitoring experience
 - the data required
 - the analysis of mortality, withdrawal, expense and investment experience
 - the analysis of surplus / profit
 - the use of the results to revise the models used and assumptions

End of Syllabus