Institute and Faculty of Actuaries

Subject ST2
Life Insurance
Specialist Technical

Syllabus

for the 2018 exams

1 June 2017

Aim

The aim of the Life Insurance Specialist Technical subject is to instil in successful candidates the main 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 – Actuarial Risk Management: 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 and risks of the products for the insurer
- the purpose and risks of the products for 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 options and guarantees

(c) Describe methods of distributing profits to with profits policyholders.

(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
- legal environment
- regulatory environment
- taxation regime
- professional guidance

(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
- persistency
- mix of new business
- volume of new business
- guarantees and options
- competition
- actions of the board of directors
- actions of distributors
- failure of appropriate management systems and controls
- counterparties
- legal, regulatory and tax developments
- fraud
- aggregation and concentration of risk

(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 and basic features of a life insurance model
- choosing between stochastic and deterministic approaches
- the use of sensitivity analysis or the assessment of variances
- the uses of models

(j)   Describe the principles of unit pricing for internal unit-linked funds.

(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)   Describe methods of determination of discontinuance and alteration terms for without profits contracts, and calculate surrender values and alteration terms for conventional without profits contracts using reserves or by equating policy values.

(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, including profit requirements.

(o)   Describe how supervisory reserves and solvency capital requirements may be determined for a life insurance company, including:

- the reasons why the assumptions used may be different from those used in pricing
- market consistent valuation
- the calculation of non-unit reserves
- the interplay between the strength of the supervisory reserves and the level of solvency capital required
- Value at Risk (VaR) capital assessment
- comparison of passive and active valuation approaches

(p)   Describe the principles of investment and how they apply to a life insurance company.

(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, persistency, expense and investment experience
- the reasons for analysis of surplus
- the reasons for analysis of embedded value profit
- the use of the results to revise the models used and assumptions

END OF SYLLABUS