



MERU UNIVERSITY OF SCIENCE AND TECHNOLOGY

P.O. Box 972-60200 – Meru-Kenya.

Tel: +254 (0)799529958, +254 (0)799529959, +254 (0)712524293

Website: www.must.ac.ke Email: info@must.ac.ke

University Examinations 2023/2024

SECOND YEAR, FIRST SEMESTER EXAMINATION THE DEGREE OF BACHELOR OF
SCIENCE IN ACTUARIAL SCIENCE

SMS 3220: PRINCIPLES OF LIFE INSURANCE

DATE: DECEMBER 2023

TIME: 2 HOURS

INSTRUCTIONS: *Answer question one and any other two questions*

QUESTION ONE (30 MARKS)

- a) Describe an immediate annuity contract and identify the customer needs provided by the contract. [3 Marks]
 - b) Outline five main factors affecting capital requirements in life insurance products. [5 Marks]
 - c) (i) Explain how it might be possible for someone to buy a life insurance product that is not the most appropriate product available to meet their needs. [4 Marks]
(ii) State the main risks run by a life insurance company of selling inappropriate products to customers. [2 Marks]
 - d) Discuss the main needs which a deferred annuity may provide to a customer. [5 Marks]
 - e) The amount of unit fund might become negative during the period between premium reviews.
 - i. Explain how this might happen. [3 Marks]
 - ii. Describe the implications for the insurance company and policyholder. [3 Marks]
 - f) The prime objective in building a model is to enable the actuary advising a life insurance company to give that company appropriate advice so that it can be run in a sound financial way. Describe the main features which the actuary should consider when building the model. [3 marks]
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- g) The need to compete, in a free market, may lead the management of a life insurance company to take decisions that increase its risk profile beyond that which can be supported by the available resources. State any two decisions which a life insurance company may take.

[2 Marks]

QUESTION TWO (20 MARKS)

- a) (i) Describe four ways in which a life insurance company can obtain underwriting information about a person making an application for a life insurance contract. [5 Marks]
- (ii) Explain how the information in part (i) would be used by the insurance company, and the purpose that is served by this process. [6 Marks]
- (iii) Explain why all four sources of information are not necessarily obtained for all applicants, and how the company may decide upon which of the five to obtain in any particular case. [3 Marks]
- b) In a particular country, until two years ago all products were designed and priced according to rules and bases laid down by the State regulatory authority. years ago government legislation liberalised the market, allowing companies to design and price products as they wish. A proprietary life insurance company in that country has been slow to react to the changes and has been losing market share. The company has decided to add unit-linked endowment assurances and immediate annuities to its product range. Comment on how competition may affect the design and pricing of these products. [6 Marks]

QUESTION THREE (20 MARKS)

- a) Over recent years, a life insurance company has experienced an increase in the number of surrenders of its term assurance policies.
- i. Suggest possible reasons why there may have been an increase in the number of surrenders. [6 marks]
- ii. Discuss possible actions that the company may take to reduce the number of surrenders. [7 marks]
- b) A life insurance company sells mainly unit-linked contracts. The Board of this company has agreed a merger with another life insurance company that also sells mainly unit-linked contracts. Both companies operate a range of unit-linked funds including equity, fixed-interest and property funds. An actuary employed by this insurance company has been asked to provide advice to the Board regarding the merger of the unit-linked funds of the two companies.

Describe the key considerations for the new combined company regarding the calculation of unit prices at the merger date. [7 Marks]

QUESTION FOUR (20 MARKS)

- a) State three most common methods in which a life insurance business may be taxed. [3 Marks]
- b) In most investigations, actuaries have to make assumptions about the future. Because we cannot predict the future with certainty, there are risks attached to making these assumptions. Describe these risks. [3 Marks]
- c) Local culture and religious beliefs can impact the propensity of consumers to purchase insurance products. Outline the ways in which local culture affects the purchase of life insurance products. [5 Marks]
- d) A proprietary life insurance company transacts large amounts of term assurance business in a highly competitive market. Outline the main reasons why the company might wish to re-insure part of the term assurance business. [9 Marks]

QUESTION FIVE (20 MARKS)

A life insurance company has been selling level term assurance products via independent intermediaries for several years. The company will soon begin selling the product directly via its own website.

- i. Outline the main risks for the company in selling through the new distribution channel. [8 Marks]

The company is now updating its pricing assumptions for its term assurance products to reflect the new distribution channel.

- ii. Discuss the factors the company may consider when updating its pricing assumptions. (12 marks)