

Actuarial Society of South Africa

EXAMINATION

16 May 2016

Subject A302 — Communications

Time allowed: Three hours

INSTRUCTIONS TO THE CANDIDATE

- 1. Candidates will be issued with instructions to log in using a password (which you will be provided with at the exam center).*
- 2. Enter all the candidate and examination details at the beginning of each question. Ensure that your Candidate number appears at the top of each page handed in. [Select “Insert”, then “Header”, input your candidate number on blank header template and select “Close Header”].*
- 3. Save your work continuously throughout the exam, on the provided computer’s hard drive.*
- 4. You have 15 minutes at the start of the examination to read the questions. You are strongly encouraged to use this time for reading only, but notes may be made. You then have three hours to complete the paper.*
- 5. You must not start typing your answers until instructed to do so by the invigilator/supervisor.*
- 6. Mark allocations are shown in brackets on exam papers.*
- 7. Attempt all questions, beginning your answer to each question on a new page.*
- 8. Candidates should show calculations where this is appropriate.*
- 9. Candidates are required to do a word count for the email– don’t forget to show this at the end of Question 2.*

Note: The Actuarial Society of South Africa will not be held responsible for loss of data where candidates have not followed instructions as set out above.

AT THE END OF THE EXAMINATION

***Save your answers on the hard drive.
Hand in your question paper with any additional sheets firmly attached.***

<p><i>In addition to this paper you should have available the 2002 edition of the Formulae and Tables and your own electronic calculator from the approved list.</i></p>
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QUESTION 1

“According to Statistics South Africa (Stats SA), the country’s life expectancy is on the increase again, after a significant drop to 52 years in 2005. Stats SA’s mid-year population estimates put the 2014 life expectancy at 59.1 years for men and 63.1 years for women.”

This statement was made in a newspaper article and has raised concern among some members of a provident fund. They contend that there is no point in saving for retirement which is only at 65 and they should be allowed to take the monthly provident fund contributions as take home salary every month.

The trustees have approached you as the fund actuary to prepare 8-10 Powerpoint slides that can be used by the trustees to explain what life expectancy means to members of the fund. You will need to provide a suitable definition of life expectancy.

You have decided to include some reasons for the change in life expectancy up to 2005 and between 2005 and 2014. Your research has highlighted that changes in the prevalence, medical treatment and mortality rates relating to HIV are most important to note. Draw attention to the effect that medical advances and HIV could have on future life expectancy in a developing country.

An explanation of why the quoted life expectancy is not specific to any particular member is important.

By way of example, you will demonstrate how life expectancy changes with age from those quoted in the article, by calculating life expectancies at ages 30, 50 and 65 as well as the expected age at death at these ages. The trustees want to see the expected proportion of current members by demographic group and in total that will attain 65 based on the membership details provided.

You are not required to express an opinion on the concerns of the members.

Membership

	No. of members	
Age	Males	Females
30	100	200
50	50	150

You may assume that no member leaves the fund other than by death, and no new members join the fund.

REMEMBER TO SAVE

PLEASE TURN OVER

Census Statistics have been summarised in the table below for you where l_x is the number of survivors at attained age x and $l_0 = 1000$. ${}_t p_x$ is the probability of a life aged x surviving for t years.

Statistic	Males	Females	Statistic	Males	Females
$\sum_{x=1}^{30} l_x$	28 311	27 465	${}_{30}p_0$	0.879	0.876
$\sum_{x=31}^{50} l_x$	16 362	16 782	${}_{20}p_{30}$	0.849	0.905
$\sum_{x=51}^{65} l_x$	9 515	10 788	${}_{15}p_{50}$	0.676	0.798
$\sum_{x=66}^{\infty} l_x$	4 912	8 065	p_{65}	0.952	0.973

[50]

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PLEASE TURN OVER**

QUESTION 2

From: actuarmom@mymail.com Sent: 13 May 2016 8:45am
Date: 13 May 2016 8:45am
To: alexa@bestlife.co.za
Subject: Good deal from BestLife

Dear Alex

I saw an advert for BestLife's cash back benefit, it looks amazing. I can get some life insurance and if nothing happens, I get all my money back. It seems too good to be true and one has to very careful these days. Now that you work there you can tell me if I should buy it or not.

Love Mom

Write an email reply to your mother of between 475 and 525 words (excluding the greeting and sign off). Your reply must include details of how much she will pay for the death benefit as well as for the cash back benefit and what she will get as a cash back payout. Compare this to what she would get from investing the total premium and only the cash back premium in an investment that earns 12% per annum compounded monthly, the best return available for the level of risk your mother is willing to take. Explain to her how it is possible that the cash back payout can appear to be so generous. Draw her attention to the risks associated with taking up this cash back offer. Conclude by making a recommendation that she does not take up the offer.

There are five major product terms.

- The death benefit can be taken without the cash back benefit;
- The policyholder can only have the cash back benefit if they have the company's death benefit;
- The premium for the cash back benefit is 30% of the premium for the death benefit;
- If the policy is still in force after 15 years and all the premiums have been paid in full, the policyholder receives 100% of the all the premiums paid;
- There are no expenses, commission or other charges on the cash back premium or benefit.

At age 57 your mother qualifies for a R700 000 death benefit at a premium of R550 per month payable in advance. You will use these figures to illustrate to her how the policy would work. The premium remains level for the life of the policy but there is no guarantee on the premium and the company can review the premium at any time. Your mother's financial affairs are in good order with no debt and she has no financial dependents. Her personal and financial situations are unlikely to change. The market is well regulated and due to regulatory constraints the company can only invest to earn a maximum effective return of 10% per annum.

[50]

[Total 100]

REMEMBER TO SAVE

END OF EXAMINATION