Actuarial Society of South Africa

EXAMINATION

21 October 2016

Subject A302 — Communications

Time allowed: Three hours

INSTRUCTIONS TO THE CANDIDATE

1. You will receive instructions to log in using a password which will be issued to you at the exam centre.

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 throughout the exam on your computer's hard drive.

4. You have 15 minutes at the start of the exam in which 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. You should show calculations where this is appropriate.

9. You are required to do a word count for each question.

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.

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.

QUESTION 1

Aridville is experiencing a drought and the four dams that supply the town's water are currently (September 2016) only holding 1 325 Megalitres of water. The volume of water stored in each of the dams over the last three years is shown below. The figures shown are in kilolitres (kl) held on 25 September each year.

Dam	Year		
	2013	2014	2015
A	589 745	612 987	428 759
B	1 356 258	1 002 598	1 456 987
C	758 963	612 389	657 412
D	397 598	59 622	86 330
Total	**3 102 564**	**2 287 596**	**2 629 488**

The Aridville municipality is concerned that, without rains, the dams could run totally dry in a few months. It has therefore decided to change the tariff system for water in an attempt to reduce domestic water consumption.

Current tariff system
Each domestic household receives 5kl free. Water usage beyond this is charged at a flat rate of R3 per kl.

Tariff system from 1 November 2016
Water usage is to be charged according to the following sliding scale:

Tariff block	kl water used by household	Price per kl used in tariff block
1	0-5	R0
2	5-11	R2,25
3	11-17	R4,50
4	17-23	R7,50
5	23+	R11

The tariff system was designed so that households that use less water than the average household in South Africa will receive a (slightly) lower bill than they receive currently. Those that use more will be penalised with a larger bill than they currently receive.

Draft a pamphlet of between 450 and 550 words that will explain the tariff revision to households. It should cover the municipality's water concerns and encourage the household to save water. The intention is to include the pamphlet with each household water bill for 30 September 2016.

The pamphlet must consist of a generic section that applies to all households as well as a summary of the impact of the change on the specific household based on their water usage for September 2016. The pamphlet you draft will be sent to a household of four that used 21kl of water in September 2016. The pamphlet must include at least one graphic.

REMEMBER TO SAVE

PLEASE TURN OVER

Notes:

- There are 15 912 households that use water in Aridville. These are the only users of water in the town.
- Average household water usage for Aridville is 16,8kl a month, compared to 14kl a month for the average household in the country.
- You may assume that households know that 1 Megalitre = 1000 kilolitres.
- Many water-saving suggestions are made at www.aridvillewater.gov.za/water savings , for example:

Action	Savings
Reduce shower time	16 litres per minute
Fill a bath half way instead of to the top	40 litres per bath
Close running taps	20 litres an hour
Repair leaking taps, toilets, etc.	Between 30 and 60 litres a day

[50]

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PLEASE TURN OVER

QUESTION 2

You are an investment consultant to high net worth clients in a particular country. A new client, Mr Thami Dlamini, has written you a letter querying the relative financial merits of home ownership versus renting and investing excess funds elsewhere.

The following is an excerpt from his letter dated 1 January 2016.

> I am currently paying A$27 200 p.a. rental for a house. If I were to buy the house (which is available at A$680 000) my mortgage repayments would be A$60 000 a year for 20 years.
>
> Even allowing for a yearly increase of 4% in my rent, my rent in 20 years' time will still cost less than the mortgage repayment at that time.
>
> Required mortgage repayments exceed my rent. If I continue to rent the house, I will invest the difference between these two amounts in a fixed rate investment. This fixed rate investment would be worth around A$1 152 000 after 20 years (without even taking the cost of house maintenance, which I would have to pay if I bought the house, into account)! I would therefore be A$1 152 000 better off than if I opt to buy the house. Allowing for the cost of maintaining the house would only make renting more appealing, even if the expected growth rate in house prices dropped to 4% p.a. Would you please confirm this?

The manager of your firm has asked that you write a letter in reply to Mr Dlamini. Compare the future values of the two options (purchase versus rental plus other investment) as at the end of the 20 year term. Address two different levels of growth in house prices as well as the impact of allowing for maintenance costs at 1% p.a. of the value of the house (payable by home owners).

The letter should be between 500-600 words. Count words from directly after the salutation to the end of your last paragraph.

You may assume that
- There are only two investment options: buy a house or invest at a flat rate of 8% p.a.
- House prices are currently expected to increase by 5% p.a. over a 20 year term. Some experts predict that this rate may drop to 4% p.a. over this period.
- Thami Dlamini's rental contract states that his rent will increase by 4% p.a. annually in arrears (the expected inflation rate). The next increase is due on 1 January 2017.
- Mortgage, maintenance and rental payments all take place annually in advance.
- Mortgage repayments amount to A$60 000 p.a. on an amortisation basis.
- Maintenance costs amount to 1% of the market value of a house each year. This would increase the cost of home ownership and is to be allowed for by assuming that an equivalent amount is invested into the fixed rate investment.

[50]

[Total 100]

REMEMBER TO SAVE

END OF EXAMINATION