



ACTUARIAL SOCIETY
OF SOUTH AFRICA

EXAMINATION

16 May 2023 (am)

Subject N211 — Communications Normative Skills

Time allowed: Three hours and fifteen minutes, plus an additional five minutes to allow for uploading your file on the ASSA Exam Platform

Total marks: 100

INSTRUCTIONS TO THE CANDIDATE

1. *Ensure that you are logged in and authenticated through Examiity before you attempt the examination.*
2. *Ensure that you have your exam permit handy. It reflects your candidate number to input as part of the examination.*
3. *The question paper is only available in the ASSA Exam Platform as a PDF download and may not be printed. Copy/paste of questions or parts thereof is allowed from the question paper to your answer documents only.*
4. *Download the Word and PowerPoint answer document templates from the ASSA Exam Platform. Save these Word and PowerPoint answer documents on your desktop, using your Candidate Number as filename. You are required to submit your answers in Word and PowerPoint format ONLY using these documents. No answers in any other format (e.g. handwritten) will be accepted. Save work regularly.*
5. *Ensure that your Candidate number appears in the “Header” (Word template) and “Footer” (PowerPoint template). [Double-click on the “Header”/“Footer” on the Word and PowerPoint documents, input your Candidate Number only, then press “Esc” to close the header/footer.] **Do not use your name or member number anywhere in your Word or PowerPoint answer document nor in the document name.***
6. *An Excel template will be available to use but will not be uploaded and used for the marking process.*
7. *You may not access any file from your computer, use any other computer program (e.g., Email), or open any other browser during the examination.*
8. *You may not use any other material (e.g. a Formulae and Tables book) during the examination. Any such information that may be required will be provided to you within the examination.*
9. *You are strongly encouraged to use the first 15 minutes as reading time only; however, you may start answering the paper whenever you are ready.*
10. *Mark allocations are shown in brackets.*
11. *Add your word count to the bottom of Question 1. Include words and numbers in tables and graphs.*

12. *Attempt all questions. Save your work continuously during the examination.*
13. *Show calculations where appropriate. You may use blank paper to carry out rough work calculations. You may use a calculator from the approved list only.*
14. *Upload your Word and PowerPoint answer documents only into the ASSA Exam Platform. Once you have uploaded your documents, you must click on **Finish Attempt** to save your documents. You will still be allowed to go back and make changes (**Review Attempt**) if you have time.*
15. *Once you are satisfied with your uploaded documents, click **Finish Attempt** and **Finish all and Submit**. Once you have submitted you will not be able to make any changes.*
16. ***You must submit your answer documents BEFORE the end of the allotted examination time.** You should stop writing and start uploading during the last five minutes. Take this into account when planning your review and submission. There will be no time announcements.*

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.

END OF INSTRUCTIONS

QUESTION 1

You have been approached by Mr Adams, the marketing manager of a manufacturer of a well-known soft drink to determine if a proposed one-year long marketing campaign is financially viable. The campaign gives customers two points for each can of soft drink that they buy. The accumulated points can then be exchanged for merchandise according to the table below. The table also includes the cost of the merchandise to the company.

Merchandise Item	Points	Item Cost
Sun cap	50	R 32
T-shirt	150	R 90
Towel	300	R 175
Sunglasses	500	R 290
Duffel Bag	750	R 430
Watch	1 050	R 600
Jacket	1 400	R 790
Mountain Bike	1 800	R 1 000

If a customer doesn't have enough points through purchases of soft drinks to qualify for an item at any time during the campaign, they can purchase the points shortfall at R2 per point to receive the item that they want.

To attract attention to the campaign, the company has also included a Harrier Jump Jet for 1.0bn points. The cost of a Harrier Jump Jet is R500m.



The campaign is expected to increase sales by 40% and the retail price of R10 per can of soft drink remains unchanged for the campaign. The profit margin before the campaign is R2.50 per can of soft drink and the additional sales from the campaign are expected to have a margin of R5.00 per can before the cost of the campaign merchandise.

Calculate the merchandise item cost per point and show that it is only necessary to consider the scenario where all points are exchanged for sun caps. For all the illustrations below assume all points are exchanged for sun caps even if it means a fractional sun cap.

Using a mini-income statement of revenue, expenses, merchandise costs and the resulting net profit, calculate the profit margin excluding the campaign and including the campaign. For these income statements assume 1 000 sales excluding the campaign. Explain to the company that the campaign is still financially viable even though the profit margin reduces by running the campaign.

If a customer earns 40 points from 20 purchases the profit to the company from the customer is R64.20. If the company includes the points purchase option and the customer uses this to receive a sun cap, the profit reduces to R52.29. Using only the profit per customer in this paragraph, express a view whether the points purchase option should be included or not. Do not do any further calculations.

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One of the marketing team has said that the 1bn points for the Harrier Jump Jet looks silly in the brochure and the same effect of drawing attention to the campaign can be had by using 100m points. Even using 100m points for this item means the equivalent of almost 137 000 cans per day over the year of the campaign, which everyone agrees is impossible.

As a Consulting Actuary, write a letter on letterhead to the company considering all the information above, summarizing the key features of the campaign and setting out your assessment of the financial viability of the campaign.

Conclude your letter with any recommended amendments to the campaign to ensure its financial viability.

Your letter should be between 550 and 650 words. Indicate the word count on your answer. Count your words from the subject line to the closing sentence without counting addresses or complimentary close. Ensure that all words and numbers in tables/graphs are included.

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[Total 50]

QUESTION 2

You are a recently qualified actuary working for an investment firm. You have been approached by a friend who is an electrician to make the case to a local homeowners' association to install solar power backup systems for domestic use.

There are three options available to homeowners in the area:

1. Remain on Eskom power;
2. Install a backup power system with inverter, battery array and solar panels; or
3. Rent the backup power system as in two for a monthly fee.

You have gathered some information as listed below to make the case at the AGM of the homeowners' association.

Loadshedding has become a matter of course rather than the exception to the rule. The table below outlines the hours of power outages due to loadshedding over the past five years:

Year	Hours of loadshedding
2018	127
2019	530
2020	859
2021	1169
2022	3773

Additionally, from 2018 to 2022, electricity tariffs increased by 70%, while inflation over this period was 22%.

Your analysis has established that the average electricity consumption for the neighbourhood in the past year has been R2 500 per month. Eskom tariffs are due to increase by 18.65% on 1 April 2023 and again by 12.74% on 1 April 2024. Thereafter you have assumed (conservatively) that Eskom price increases will continue at 12% per annum on 1 April each year.

Eskom relies heavily on coal for power generation with 80% of its power output generated by this means. However, South Africa has an abundance of clean power available by virtue of its beautiful weather. Solar power is the most abundant unharnessed energy source in the country and, it is possible for individual households to use this resource and reduce their reliance on Eskom. A full solar installation will be able to reduce Eskom reliance by roughly 90%, so any solar solution will still require a household to pay 10% of their previous bill to Eskom.

A solar power backup solution with an inverter, battery array and solar panels for an average household in the neighbourhood will cost about R200 000 to install as at 1 April 2023. In the recently announced budget speech, it was outlined that homeowners can earn a tax rebate of up to R15 000 on their solar panel installations. This installation ensures that the maximum rebate can be earned. You should assume that the rebate can be claimed immediately from the upfront costs of installing the system. The components of such a system carry a 10-year guarantee.

For the rental option, all maintenance fees and replacement costs are included in the fees. There will be a once-off fee of R2 900 for installation and a monthly fee of R2 430 thereafter. The fee increase for this option would be about 6% per annum.

Homeowners will also be protected against the significant price increases that Eskom has been able to implement and will likely continue to do so.

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Prepare an 8-10-slide presentation outlining

- the current electricity situation,
- the benefits of switching to solar,
- the monthly costs of Eskom vs renting a solar installation over time,
- a comparison of the relative present value, and
- relative advantages and disadvantages of the costs for all three options above.

You may use the assumptions outlined below for your calculations. You have prepared the first two draft slides as below but would like to edit them further.

Assumptions:

- Compare all three options over a 10-year period, ignoring any replacement costs after this period.
- Assume a risk discount rate of 7% per annum, compounded annually to calculate the present value of each option.
- Electricity is prepaid, so payable at the start of the month.
- Explore all three options should the system be installed on 1 April 2023.

Harness the power of the sun

Presented by: Jennifer Masinga
On behalf of Zap Electricians and Solar Solutions
To: The Park Homeowners' Association
25 March 2023

Agenda

- Eskom: inflation busting increases and the increasing burden of loadshedding
- Current average household usage
- Going solar
- Costs of Eskom vs Renting Solar vs Buying Solar
- Comparison of options
- Conclusion
- Q&A

[Total 50]
[Grand Total 100]

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END OF EXAMINATION