INSTITUTE AND FACULTY OF ACTUARIES
EXAMINATION

November 2015

Subject CA3 – Communications

Paper 2

Time allowed: 2 hours

INSTRUCTIONS TO THE CANDIDATE

1. *The work you submit MUST be saved in Microsoft PowerPoint 2007 format, e.g. using the pptx file extension.*
2. *You have two hours to prepare and upload your exam attempt.*
3. *You may print one copy of your slides in preparation for giving the presentation tomorrow. You are not permitted to make any further copies of your presentation.*
4. *Copies of Formulae and Tables and core reading for subjects CT1–CT8 inclusive and CA1 will be available electronically during the exam. These documents are for your use during the exam period only and not for general use. No other material can be referred to.*
5. *In addition to this paper you should have available your own electronic calculator from the approved list, http://www.actuaries.org.uk/research-and-resources/documents/exam-policies*
6. *You are not permitted to use the internet to help you during the exam.*
7. *You are required to work through the exam assignment without assistance from another person. You are reminded that by undertaking this exam you are bound by the Institute and Faculty of Actuaries' Examinations Rules and Regulations. By submitting your files you are confirming that all material is entirely your own work and you wish this to be taken into account for this assessment. Only the first submission will be accepted.*
8. *Save your work regularly. Saving your work is your responsibility so failure to do so will not be a significant mitigating circumstance.*
9. *At the end of the exam, save your presentation and follow the upload instructions that have been provided. All related material that you have printed including slides, notes, etc. must be confidentially stored until we have informed you to delete/destroy them once the exam is over. Do NOT log off the application until you receive confirmation of receipt from the Online Education Team.*
10. *If you encounter any difficulties please email online_exams@actuaries.org.uk or call the Online Education Team on +44 (0)1865 268255.*
11. *Professional behaviour is mandatory and no material relating to the exam may be disclosed or discussed with others, nor used in a further attempt at the exam. Failure to comply with this will be deemed to be a breach of the examination regulations and may result in disciplinary action.*

PLEASE NOTE THAT THE CONTENT OF THIS PAPER IS CONFIDENTIAL AND STUDENTS ARE NOT TO DISCUSS OR REVEAL THE CONTENTS UNDER ANY CIRCUMSTANCES.

You work as a qualified actuary for ABC Consulting Limited. Your boss has been advising one of ABC's clients, Aardvark Limited, in relation to setting up a Save As You Earn share scheme (SAYE) for all its employees. The details of the scheme have been approved by Rebecca Scott, the head of the Personnel and Human Resources department at Aardvark, and she has asked ABC to give a presentation to the Human Resources team at Aardvark to explain how the scheme works.

The Human Resources team contains individuals from various backgrounds, and includes some recent joiners who are new trainees.

Your boss, Jonathan, has given you the following instructions:

Rob

As you know the HR team at Aardvark consists of people from various backgrounds. Some of them will not understand the basic details of SAYE schemes and most of them will not know the precise detail of the scheme Rebecca has agreed. They will not have mathematical backgrounds so you will have to go through the numbers very carefully. They will also be responsible for answering questions from employees about the scheme.

I'd like you to present to the HR team to give them some background and an explanation of how the Aardvark SAYE share scheme will work. You should set out the costs and the benefits of the scheme. You should let them know how Aardvark's share price has varied in the recent past, and you should draw out how the returns on the Aardvark scheme might compare to interest obtained from a regular savings account.

Rebecca also really liked the illustrations we provided her based on an employee paying £100 a month, showing the total employee costs and possible outcomes based on a future share price of both £4 and £6, and she has specifically asked you to include these in your presentation.

Rebecca has also said you should assume the share price on 1 December 2015 is £5.20.

Your slot is for 12:20 pm and I know the HR team have a break for lunch at 12:30 pm. They also have further presentations at 1 pm from Aardvark's lawyers. Please make sure you don't go over the ten minutes allocated for your slot.

Regards
Jonathan

Prepare your presentation lasting no longer than 10 minutes.

In order to assist you in your presentation, Jonathan has arranged for a junior actuarial student to provide you with some further information. This is provided below together with the figures used when ABC were in the final stages of providing Rebecca with possible design options for the SAYE scheme.

Background on Aardvark Limited SAYE scheme

Aardvark want to introduce a SAYE scheme because they wish to align the remuneration of employees with the fortunes of the Company to a greater degree. Recently they have been experiencing above industry average levels of employees leaving and they wish to address the employee turnover issue by introducing a longer term incentive for employees to remain with the Company.

Aardvark also feel their compensation and reward package is less generous than that of their local competitors, who have had SAYE schemes for several years. Some people who have left Aardvark have gone on to make big sums of money from the SAYE schemes operated by Aardvark's competitors and word is catching on!

How the SAYE scheme works

First of all, the SAYE share scheme is voluntary – it is offered to all staff but they do not have to join. The scheme will run for 3 years from 1 December 2015 to 1 December 2018. Employees can elect to pay between £10 and £250 a month and they must continue to make payments at their initially selected level for the remainder of the 3 year period. Payments are deducted at the start of a month directly by payroll.

At the end of the 3 year period, an employee will have built up a SAYE accumulated fund calculated as the sum of:

1. the employee's monthly amount × 36; PLUS

2. an additionally credited guaranteed bonus contribution equivalent to 2 months' worth of contributions determined at the level of the employee's regular monthly contribution.

If an employee leaves before the 3 years is up, the member just gets the value of their payments returned – no bonus is payable, nor is there any option to purchase shares.

At the end of 3 years, an employee has two options with his or her accumulated fund:

Option A: to use the accumulated fund (including the 2 months' bonus payments) and convert it into a number of shares based on the price at 1 December 2015 discounted at 20%, with the option to then sell at the share price on 1 December 2018; or

Option B: to take the accumulated SAYE fund value (including the 2 months' bonus payments).

In more detail, we have:

Option A

The number of shares is effectively pre-determined at outset based on the employee's selected contribution level.

The formula for the number of shares purchased is: ([36 +2] × *C*) / (*P* * 0.8), where *C* is the monthly amount paid by the employee and *P* is the share price at 1 December 2015. The number of shares purchased is rounded down to an integer number.

In effect, employees are able to buy and then sell Aardvark shares in 2018 based on a 20% discount to their price on 1 December 2015: employees effectively get the benefit of the 20% discount, the 2 months' bonus contributions and any growth in share price between December 2015 and December 2018.

For instance, based on an assumed Aardvark share price of £5.20 on 1 December 2015, employees are buying shares based on a price of 5.20 × (1 – 0.20) = £4.16. So, for an employee contributing £50 a month, the number of shares purchased
= ({36 + 2} × 50) / 4.16 = 456.73, rounded down to 456 shares. If the share price is then £8 at 1 December 2018, an employee could sell the 456 shares for £3,648 – quite a handsome profit!

Option B

To simply take the value of the accumulated fund of money. This is just the ({36 + 2} × 50) part of option A, which gives £1,900.

Which is best out of Option A and Option B obviously depends on the level of the share price at 1 December 2018. If it is above the discounted value on 1 December 2015, Option A will be better. If not, Option B will be better. This is what you should illustrate for the HR team.

Comparison with a savings account

Some of the HR people will probably be wondering why employees would bother joining the SAYE share scheme if they have to commit to payments for 3 years and the ultimate share price is unknown and it might be lower than it is now. Some of the HR people, and many employees, will be aware that the Aardvark share price has been volatile over the last 15 years as a result of the financial crisis in 2008 and also some volatile trading results. The following information should illustrate the point:

Aardvark Limited's share price has been as follows at 1 December:

Year	*Share Price (£)*
2000	1.25
2001	1.46
2002	1.99
2003	2.23
2004	6.58
2005	8.42
2006	6.55
2007	7.56
2008	4.27
2009	5.69
2010	3.45
2011	4.07
2012	6.38
2013	7.63
2014	5.65
2015	5.20 assumed

You should also draw attention to how the potential returns from the SAYE scheme compare to what would happen if a member were to simply invest the monthly payments into a savings account.

For the comparison with the savings account, the following should be helpful:
$\ddot{s}_{\overline{3|}}^{(12)}$ @ 3.75% p.a. = 3.176802.

You should ignore the impact of taxation and share selling costs – Rebecca says these are details for another day. Also, ignore the impact of people dying or retiring or being made redundant before the 3 years is up – special provisions apply here which can be covered later.

END OF PAPER