

# Actuarial Society of South Africa

## EXAMINATION

16 May 2017

### 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

You and your friend Anele have been debating the effect of minimum wages on employment. You have decided to write him an email to show the relationship between supply and demand for labour. Anele is not mathematically inclined and won't understand a formula, but you can assume she can read a graph.

To illustrate the effect you will use the supply and demand for a Lapidary, which on occasion, Anele has expressed an aspiration to become. Lapidaries operate in a competitive market with a variety of employment opportunities and there are currently 1 000 licenced individuals not all of whom are currently working. The current minimum wage is R7 000 per employee per month.

A research paper that you found gave formulae for supply of and demand for their labour as:

- Supply:  $f(x) = 0.015x^2 + 662$
- Demand:  $g(x) = -24x + 31\,900$

where  $x$  = the number of Lapidaries employed.

$f(x)$  = Monthly wage at which the  $x^{th}$  Lapidary is willing to work.

$g(x)$  = Monthly wage employers are willing to pay for the  $x^{th}$  Lapidary.

Your email must include a graph of the supply and demand represented by these formulae. The number of Lapidaries employed will be on the horizontal axis with a scale starting at 650 and ending at 1 000. The marginal monthly wage of the  $x^{th}$  employee will be on the vertical axis from R0 to R18 000. Explain to Anele what the graphs represent and illustrate how to read a value from the graph. Explain what the point where the supply and demand graphs intersect means and how, if demand exceeds supply, market forces will drive employment towards this point and vice versa.

Include the percentage of all Lapidaries that are employed and unemployed if the market for their labour is in equilibrium.

To illustrate the effect of minimum wages you will use a new minimum monthly wage of R9 000 and R13 000, and then explain how many more Lapidaries would like to work and what would happen to the number that employers are willing to employ. Compare the revised employment statistics in these situations to those on the current minimum wage.

Conclude whether minimum wages reduce employment or not.

Make Anele aware of your main concern with this simplistic model view of Lapidary employment.

Notes

- Format your email with the appropriate details.
- Your email must be of no more than 600 words counting from after the salutation and excluding the sign off.

[Total 50]

**REMEMBER TO SAVE**

**PLEASE TURN OVER**

## QUESTION 2

The Mexican credit regulator has introduced new regulations that require credit providers to provide the borrower with a fact sheet before they enter into a loan agreement. You work for DLR Credit Inc. which provides loans of up to five years with little or no security and have been tasked to create a mockup of the fact sheet that includes the information required by the regulator.

The regulations require some specific information to be provided and must be personalized for the client.

- The name of the credit provider and the borrower
- The contact details of the parties to agreement
- The details of the loan
  - The amount borrowed
  - The repayment instalment amount and frequency of payment
  - Any expected changes to the installment
  - The interest rate that is to applied
  - The date the funds are borrowed
  - The date on which the borrower has no further liability to the lender
  - The amount of interest payable over the term
  - Any charges levied in addition to interest
  - The consequences of non-payment.
- The client must be shown how much interest they would save if the monthly repayment installment is increased from the start of the loan so as reduce to the loan term by 12.5%.
- To illustrate the risk of an n increase in interest rates the client must be shown how much more interest they would pay if interest rates increased by 3% per annum, for example from 10% to 13% per annum, from half way through the loan term. In this event the repayment is increased so that the loan is still repaid on the original date. This is not required if the loan interest rate is fixed for the term of the loan.

For the purpose of the mockup, the following client loan is to be used. Mr D Trump has borrowed an amount of \$10 000 to build a garden wall which he will repay in equal monthly installments, in arrears over 4 years. The interest rate is 1% above the prime interest rate quoted by XYZ bank. The prime rate is currently 8% per annum with interest charged monthly in arrears on the outstanding balance at the start of the month. The prime interest rate is variable and can change at any time in future. There is a once off fee of \$50 payable at the start of the loan. The loan is unsecured.

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### Additional Information

- There are no penalties for early repayment of the loan.
- If a loan is not repaid, the credit provider may through the courts attach the assets of the borrower and the borrower may be listed with a bureau. Credit providers don't lend money to people listed with a bureau.
- The regulator expects the fact sheet to be written in a way that encourages responsible use of credit facilities and early repayment of loans is to be encouraged.
- The fact sheet must be no more than 550 words including all words and numbers in tables.

[Total 50]

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**END OF EXAMINATION**