Tutorial Letter 101/3/2018

Introductory Financial Mathematics

DSC1630

Semesters 1 and 2

Department of Decision Sciences

Important information

Please register on myUnisa, activate your myLife e-mail address and make sure that you have regular access to the myUnisa module site, DSC1630–18.

This tutorial letter contains

1. Important information about the module
2. First semester: Assignment questions
3. Second semester: Assignment questions

Contents

Chapter 1

General information

1.1 Introduction and welcome

It is a pleasure to welcome you as a student to the DSC1630 module. We trust that we will meet each other some time during the semester and that you will find this module in Introductory Financial Mathematics interesting and stimulating.

Introductory Financial Mathematics is a semester module. The module may be completed during the first OR second semester of 2018. You have to register for just one of the two semesters. If you complete the module successfully, you do not have to register for it again. If you fail the module, however, you **must** re-register so that you can repeat it.

1.2 Getting started

Getting started with DSC1630, you have to

- **register as a user on myUnisa as soon as possible** if you not done so yet.
  Go to `https://my.unisa.ac.za` to start the process. The first link on top on the right-hand side, "Claim UNISA Login", will take you through the registration steps. On myUnisa you will be able to download all your study material electronically, submit your assignments and update your bibliographical details.
- ensure you can access your myLife email account.
  During the registration process on myUnisa, you will also be given access to myLife, a web-based email system for Unisa students. All email correspondence will be sent to your myLife email account. Therefore, you have to **access your myLife email account regularly** or even better, forward all your myLife emails to an email account you use daily. (If you do not know how to forward your myLife emails, google for instructions.)
- check if your cellular number is correct.
  Unisa sends announcements to you by SMS. You can update your contact details by logging in on myUnisa, clicking on MyAdmin tab, "Bibliographical Details". Next click on the top tab "Update Contact Details".
- check if your examination centre is correct.
  Changes in examination venues must be done before 31 March 2018 (semester 1) or 31 July 2018

(semester 2). Again, log in on myUnisa, clicking on the MyAdmin tab then choose, "Bibliographical Details". Next click on the top tab "Update Examination Centre".

After you have completed the four steps above, you are ready to start studying *immediately* and *regularly* to complete the module within the given time frame. All your study material is available on myUnisa on the DSC1630 web page under "Official Study Material" and "Additional Resources".

Start your DSC1630 studies by carefully reading through the rest of this tutorial letter. Then return to the proposed study schedule, which would guide you through your study material.

1.3 Purpose and outcomes of the module

The purpose of the module is is to provide fundamental introductory knowledge, and skills to identify which mathematical formulæ to use in a specific financial problem. Students who complete this module will be able to solve problems involving interest rates, annuities, amortisation, bond pricing and capital budgeting.

The outcomes and assessment criteria of this module can be found on myUnisa on the DSC1630-18 web page under Additional Resources.

1.4 Lecturers and contact details

The lecturer for DSC1630 will assist you if you experience any difficulties regarding the study material. Do not hesitate to contact her, but please make an appointment if you want to see her personally.

Her contact details are:

Mrs Adéle Immelman
E-mail: immelmf@unisa.ac.za

1.5 Student support services for the module

For information on the various student support systems and services available at Unisa (e.g. student counselling, tutorial classes, language support), please consult Study@Unisa, which can be downloaded from myUnisa home page..

1.5.1 Contact with fellow students

- ***myUnisa***

  If you have access to a computer that is linked to the internet, you can quickly access resources and information at the university. The myUnisa learning management system is Unisa's online campus that will help you to communicate with your lecturers and with other students via the Discussion Forums, all through the computer and the internet.

  To go to the myUnisa website, start at the main Unisa website, `http://www.unisa.ac.za/` and then click on the " myUnisa" link. This should take you to the myUnisa website. You can also access it directly by typing in `https://my.unisa.ac.za/`.

1.5.2 Face-to-face tutors

Face-to-face tutoring involves face-to-face **contact sessions between the students and the tutor**, that means students meet with their tutors in a classroom setup, at designated venues and at specific times at the **Unisa Regional Learning Centres**. Face-to-face tutors are qualified experts who are practitioners and specialists in the subjects in which they are appointed to be face-to-face tutors.

To join face-to-face tutorials you need to go to the **Unisa Regional Learning Centre** nearest to you to enroll for tutorials. See myUnisa's landing page, Learners Support and Regions for details. The regional offices will supply you with the dates, place and times of the sessions for the modules you had enrolled for. Note that not all Regional offices present tutor classes.

1.5.3 E-tutors

E-tutoring entails the delivery of **teaching and learning online via the internet**. An e-tutor is the person who undertakes the role to support and enable students to learn online effectively. E-tutors are qualified experts who are practitioners and specialists in the subjects in which they are appointed to be e-tutors. Students will be grouped to e-tutors after the registration process has ended. Students will receive a system generated mylife e-mail notification, informing them that they are allocated to an e-tutor. To access your tutor, log on to myUnisa. You will have an additional module tab with the module code for example DSC1630-18-S1-E1. Once you have opened the additional module tab you can start communicating with your e-tutor through the discussion forum or other communication tools available on the group site.

1.6 Module specific study plan

1.6.1 Study material

There are no prescribed books, e-reserves or recommended books for this module.

Please take note that all the study material can be downloaded from myUnisa.

The Department of Despatch should supply you with hard copies of the following study material:

- Tutorial Letter 101, 2018 (this tutorial letter). This contains
  - general information
  - compulsory assignments for each semester
- a study guide: Introductory Financial Mathematics
- a DVD containing instructions for using the recommended calculators

Other tutorial letters will be posted online on myUnisa during the course of the semester.

Note: Contact Despatch for any queries relating to study material.

When you register, you will receive an inventory letter containing information about your tutorial matter.

1.6.2 Study time

As this module is of a mathematical nature you will not be able to master it in a short period of time. You will have to work consistently and according to a timetable if you want to be successful.

There are about three months (± 12 weeks) of study time in a semester. In this short period you have to work through the study material and prepare yourself for the examination. In view of the fact that your study time is limited, you will have to plan carefully. We suggest that you spend at least 45 minutes per day on this module. We have divided your study material into sections. You should be able to complete each section together with the relevant self-evaluation exercises within a week. By the end of each week

- you should have worked through the designated section of the study material
- you should have completed the self-evaluation exercises relevant to the study material.

Only then should you continue with the next part of the study material. If you follow this schedule you will have enough time left to revise the study material for the examination.

Work covered	**Study time**	**Self-evaluation exercise**
Chapter 2	Week 1	1
Chapter 3 up to 3.2	Week 2	2
	Compulsory assignment 1	
Chapter 3	Week 3	2
Chapter 4 up to 4.2	Week 4	3
	Compulsory assignment 2	
Rest of Chapter 4	Week 5	3
Chapter 5	Week 6	3
	Compulsory assignment 3	
Chapter 6	Week 7	4
Chapter 7	Week 8	5
Chapter 8	Week 9	6
	Compulsory assignment 4	
Typical examination questions	Week 10	7 and 8

1.6.3 Calculator

The use of a **financial calculator** **is absolutely essential for this module**.

You may use any make or model that you prefer. However, the Department of Decision Sciences has decided to provide instructions only for the following two models:

- SHARP EL-738 or SHARP EL-738F
- Hewlett Packard HP10BII or HP10BII+

These financial calculators are also recommended by other departments in the College of Economic and Management Sciences.

You need to purchase **ONE** of these financial calculators.

- The SHARP EL-738 and SHARP EL-738F calculators may be obtained from most suppliers of SHARP calculators or from a Sharp Electronics branch. Take your Unisa student card with you and ask the sales manager for a special student price. Remember that an ordinary shop will not sell it to you at a student price.
- The Hewlett Packard HP10BII and HP10BII+may be purchased from most shops selling electronic appliances.
- Please note that these calculators can also be obtained on online webpages.

It is advisable to purchase your calculator as soon as possible as it takes time to master the use of it.

How to operate the SHARP and the HEWLETT PACKARD calculators are explained in

- the notes on the calculators that are under Additional Resources on myUnisa or
- the DVD that you received with your study material.

PLEASE NOTE:

The SHARP EL-733A financial calculator or the SHARP EL-5250 and SHARP EL-5120 programmable calculators may still be used. No assistance will however be given to users of these calculators. You may however find the manual for the SHARP EL-733A financial calculator, the SHARP EL-5120 programmable calculator and the SHARP EL-5250 programmable calculator on myUnisa under Additional Resources.

1.6.4 Study method

We suggest that you follow these steps when you work through your study material:

1. Buy **ONE** of the recommended calculators and master it before you start with your studies.
2. Read through the study material and do all examples that are given. Summarise key words.
3. Then do the exercises related to the study material that you have studied. **Use your calculator for the calculations.**
4. Check your answers against the answers that are supplied.
5. Work through the chapter as described above and then do the evaluation exercises at the end of the chapter.
6. Then do the self-evaluation exercises for that chapter (which are under Additional Resources on myUnisa).

If you have any problems with the study material at any stage please contact the lecturers immediately so that they can help.

1.6.5 Self-evaluation exercises

To help you in your preparations for the assignments and the examination, we provide you with extra exercises and solutions that are known as self-evaluation exercises. Most of these questions originate from old examination papers.

Self-evaluation exercises are important for the following reasons:

- Self-evaluation exercises assist you in understanding and mastering the study material and its practical applications. They are, therefore, an integral part of the study material.
- Self-evaluation exercises test your knowledge and understanding of the study material. They provide a way to evaluate your progress.

You are, therefore, strongly advised to do all the self-evaluation exercises. The self-evaluation exercises can be found on myUnisa under Additional Resources.

1.7 Assessments

1.7.1 Compulsory assignments

See Chapter 2 of this tutorial letter for the first semester's assignments and Chapter 3 for the second semester's assignments.

There are four compulsory assignments per semester. The mark of each of the four assignments will contribute 25% towards your semester mark. **The assignments must be submitted via myUnisa**.

Make sure that the assignments reach the University BEFORE the due dates. UNDER NO CIRCUMSTANCES WILL EXTENSIONS BE GRANTED FOR SUBMISSION OF THE ASSIGNMENTS.

Note that you have to submit Assignment 01 by its due date to get admission to the examination.

1.7.1.1 Due dates of assignments

Semester	Assignment number	Study material covered	Unique number	Due date	% contribute towards year mark
1	1	Chapter 2 – 3.2	782471	20180227	25%
	2	Chapter 3 – 4.2	846968	20180314	25%
	3	Chapter 4, 5	656421	20180329	25%
	4	Chapter 6, 7, 8	833329	20180418	25%
2	1	Chapter 2 – 3.2	862126	20180807	25%
	2	Chapter 3 – 4.2	771649	20180822	25%
	3	Chapter 4, 5	830328	20180906	25%
	4	Chapter 6, 7, 8	654698	20180926	25%

1.7.1.2 How to approach the assignments

Each assignment covers certain sections of the study material. Work through these relevant sections in the guide before you do the assignments. Always give yourself enough time to prepare for the assignment. See Section 1.5.2 of this tutorial letter for a general study plan. Herewith some guidelines on how to approach assignments:

1. Work through the relevant sections as specified at the beginning of the assignment.
2. Contact your lecturer (e-mail or telephone) or your e-tutors (when you have been grouped) to sort out any problems with the study material. You are also welcome to make an appointment and see your lecturer, if you are around Pretoria.
3. Do all the examples and exercises in the study guide.
4. Do all the self-evaluation exercises on myUnisa under Additional Resources – examples of similar questions.
5. **ONLY THEN ANSWER THE ASSIGNMENT'S QUESTIONS.**

1.7.1.3 How to answer an assignment question

1. **Read** through the question.
2. **Draw** a **time line** of the situation, where applicable.
3. Try and identify the type of problem asked. Look for keywords, for example, the type of interest rate, or payment methods used, will help you to decide which formula to use.
4. Write down the applicable **formula**.
5. Go back to question and **identify** the **given values** and substitute them into the formula.
6. **Manipulate** the formula if necessary.
7. Use your **calculator** to solve the unknown.

1.7.1.4 Submission of assignments

You must submit the assignments via myUnisa (https://my.unisa.ac.za). Assignments MAY NOT be submitted via e-mail.

To submit an assignment via myUnisa:

1. Go to myUnisa – `https://my.unisa.ac.za/`
2. Log in with your student number and password.
3. Select the module DSC1630-18-S1 on the orange tab.
4. Click on Assessment Info in the menu on the left-hand side of the screen.
5. Click on the assignment number you want to submit.
6. Follow the instructions.
7. Since you are submitting a multiple choice assignment you will be asked to enter the number of questions in the assignment. Once you enter this, the question numbers will be displayed with five answer options, namely 1, 2, 3, 4 and 5 next to each question number. Click on the radio button (small circle) that corresponds to your answer. Once you have completed all questions you can then click on the submit button.

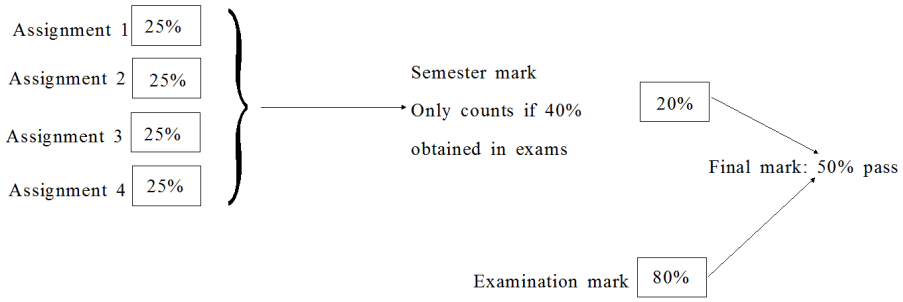
8. Note that when you submit an assignment, myUnisa closes that specific attempt and opens a **re-submit** option in order to give you an option to re-submit. Thus, as long as you see the re-submit option at an assignment the assignment is still open for submission. It only closes when the marking process starts. After you re-submitted an assignment successfully, your previous attempts will show as **cancelled**. If you re-submit after the due date it will give you a message saying "late submission" but **normally** it will still save the assignment for marking purposes. Your assignment marks normally will be released on the system, two weeks after the due date of the assignment. The assignment will then display the option **close**. You are not allowed to re-submit more than 10 times per assignment!

Please check under Assignment Info on myUnisa if your assignment has reached Unisa and has been registered after you have submitted your assignment. You are allowed to re-submit an assignment before the due date.

1.7.2 Examination

You are automatically admitted to the examinations by submitting Assignment 01 before its due date.

The composition of your final mark can be summarized as:



For example:

Suppose you obtained 80 marks for Assignment 01, 60 marks for Assignment 02, 20 marks for Assignment 3, 80 marks for Assignment 4 and 40 marks in the examination.

Your semester mark will be calculated as follows:

Calculations:

25% of 80 will give you 20 marks $\left(\frac{25}{100} \times 80 = 20\right)$.

25% of 60 will give you 15 marks $\left(\frac{25}{100} \times 60 = 15\right)$.

25% of 20 will give you 5 marks $\left(\frac{25}{100} \times 20 = 5\right)$.

25% of 80 will give you 20 marks $\left(\frac{25}{100} \times 80 = 20\right)$.

Your total semester mark is thus $(20 + 15 + 5 + 20)$ i.e. 60. This 60 will contribute to 20% of your final mark. Thus $\frac{20}{100} \times 60 = 12$.

Your examination mark will be calculated as follows:

Calculation:

80% of 40 will give you 32 marks $\left(\frac{80}{100} \times 40 = 32\right)$.

Your final mark will be now calculated as the 12 of the year mark and 32 of the examination $32 + 12$, that is 44%.

The provisional examination dates can be found on myUnisa. The duration of the examination for this module is two hours.

Please note the following:

- You may use any financial or programmable calculator in the examination.
- You may only take your calculator and writing material, but no paper, into the examination hall.
- The paper consists of only multiple-choice questions that must be answered on a mark-reading sheet.
- You must use an HB pencil to mark the correct options.
- A formulae sheet and the table with the number of each day of a year, will be supplied – see Additional Resources on myUnisa for an example.

The examination will cover all the study material. It is, therefore, important that you do as many examples as possible. Remember, practice makes perfect!

In conclusion, we hope we will enjoy a happy and successful semester together. Please remember that we are here to help you, no matter how big or small your problem might be.

It is now time to start. Clean your desk, unpack your books, make yourself a cup of coffee and let's get the DSC1630 ball rolling.

Chapter 2

First semester compulsory assignments

Assignment 01 must be submitted by its due date to obtain admission to the examination

2.1 Compulsory Assignment 01

Due Date: 27 February 2018

Unique Number: 782471

Please work through the following before answering the assignment questions:

- Study guide: Chapters 2 – 3.2 in the study guide
- Self evaluation exercises week 1 and 2 under Additional Resources on myUnisa

This assignment **MUST** be submitted via myUnisa.

Question 1

Tuli has borrowed money from Safari. She has to pay Safari R15 000 two years from now. She decides to pay him back earlier. If a simple interest rate of 12,5% per year is applicable, then the amount that Tuli will have to pay Safari nine months from *now* is

[1] R12 656,25.

[2] R12 972,97.

[3] R13 125,00.

[4] R13 664,28.

[5] R13 714,29.

Question 2

If a simple interest rate of 24% per year, is equivalent to a simple discount rate of 20,5% per year, then the time under consideration is approximately

[1] 260 days.
[2] 304 days.
[3] 312 days.
[4] 711 days.
[5] 854 days.

Question 3

If the nominal interest rate per year is 16,5% per annum, compounded at the end of every second month, then the effective interest rate is

[1] 14,53%.
[2] 16,18%.
[3] 16,68%.
[4] 17,68%.
[5] 18,00%.

Question 4

Susan borrows money from the bank at a discount rate of 16,5% per year. She must pay the bank R30 000 in eight months from *now*. The amount of money she receives from the bank now is

[1] R26 700,00.
[2] R27 027,03.
[3] R33 300,00.
[4] R33 463,26.
[5] R33 707,87.

Question 5

Michael needs R10 500 in ten months' time to buy himself a new lens for his camera. Two months ago he deposited R9 000 in a savings account at a simple interest rate of 11,5% per year. How much money will Michael still need to buy the lens ten months from now?

[1] R229,50
[2] R408,67
[3] R465,00
[4] R637,50
[5] None of the above

Question 6

Nina borrowed money on 31 August and agreed to pay back the loan on 2 November of the same year. If the discount rate is 18% per year and she received R5 000 on 31 August, what is the value of the loan that Nina has to pay the bank on 2 November?

[1] R5 000,00
[2] R5 160,32
[3] R4 844,66
[4] R5 155,34
[5] None of the above

Question 7

Stefan invests an amount of money in an account earning 13,88% interest per year, compounded weekly. After five years, this amount has accumulated to R50 000. The amount that was invested initially is

[1] R15 300,00.
[2] R25 001,79.
[3] R26 105,54.
[4] R29 515,94.
[5] R34 700,00.

Question 8

If R400 accumulates to R460 at a simple interest rate of 8% per year, then the length of time of the investment is

[1] 1,873 years.
[2] 0,012 years.
[3] 26,875 years.
[4] 0,172 years.
[5] none of the above.

Question 9

An effective rate of 29,61% corresponds to a nominal rate, compounded weekly, of

[1] 26,00%.
[2] 29,53%.
[3] 29,61%.
[4] 34,35%.
[5] none of the above.

Question 10

You won R165 000 and decided to deposit 65% of this amount in an account earning 8,25% interest per year, compounded every four months. The accumulated amount after five years is

[1] R151 490,63.
[2] R161 110,84.
[3] R161 332,31.
[4] R247 862,83.
[5] R248 203,55.

Question 11

An investment of R20 000 accumulated to R45 200. If the applicable simple interest rate is 12% per year, then the time under consideration is

[1] 3,25 years.
[2] 4,65 years.
[3] 7,19 years.
[4] 10,50 years.
[5] 15,12 years.

Question 12

Gary invested R40 000 in order to have R56 000 available in 30 months' time. The yearly rate, compounded semi-annually, is

[1] 7,21%.
[2] 8,00%.
[3] 13,92%.
[4] 14,41%.
[5] 16,00%.

Question 13

An amount of R4 317,26 was borrowed on 5 May at a simple interest rate of 15% per year. The loan will be worth R4 500 on

[1] 12 August.
[2] 16 August.
[3] 21 August.
[4] 9 October.
[5] none of the above.

Question 14

Gert owes Jan R3 000 due 10 months from now, and R25 000 due 32 months from now. Gert asks Jan if he can discharge his obligations by two equal payments: one now and the other one 28 months from now. Jan agrees on condition that a simple interest of 14,75% per year be applicable. The amount that Gert will pay Jan 28 months from now is approximately

[1] R11 455.

[2] R11 511.

[3] R11 728.

[4] R14 000.

[5] R20 000.

Question 15

The accumulated amount that you will receive after 52 months if you deposit R7 300 into an account which earns 9,7% interest per year, compounded every second month, is

[1] R7 825,36.

[2] R8 388,53.

[3] R10 368,43.

[4] R11 076,73.

[5] none of the above.

2.2 Compulsory Assignment 02

Due Date: 14 March 2018

Unique Number: 846968

Please work through the following before answering the assignment questions:

- Study guide: Chapters 3 – 4.2 in the study guide
- Self evaluation exercises week 2 and 3 under Additional Resources on myUnisa

This assignment **MUST** be submitted via myUnisa.

Question 1

An interest rate of 17,5% per year, compounded quarterly, is equivalent to a continuous compounding rate of

[1] 17,128%.

[2] 17,185%.

[3] 17,500%.

[4] 17,888%.

[5] 19,125%.

Question 2

An amount borrowed at 29% interest per year, compounded continuously, has accumulated to R38 279,20 after four years. The initial amount borrowed was

[1] R7 160,73.

[2] R12 000,00.

[3] R12 005,53.

[4] R13 823,05.

[5] R17 721,85.

Question 3

The effective rate for a continuous compounding rate of 17,5% per year, is

[1] 16,13%.
[2] 17,50%.
[3] 19,12%.
[4] 19,13%.
[5] 21,08%.

Questions 4 and 5 relate to the following situation:
An amount of R10 000 was invested in a special savings account on 15 May at an interest rate of 15% per annum, compounded quarterly for seven months. Interest is calculated on 1 January, 1 April, 1 July and 1 October of every year.

Question 4

If simple interest is used for the odd periods and compound interest for the rest of the term, the amount of interest received after seven months is

[1] R665,54.
[2] R896,95.
[3] R901,35.
[4] R1 644,57.
[5] none of the above.

Question 5

If fractional compounding is used for the full term of seven months, the total amount of interest received is

[1] R892,79.
[2] R894,04.
[3] R898,43.
[4] R901,73.
[5] none of the above.

Questions 6 and 7 relate to the following situation:
Three years ago Jake borrowed R7 500 from Martha. The condition was that he would pay her back in seven years' time at an interest rate of 11,21% per year, compounded semi-annually. Six months ago he also borrowed R25 000 from Martha at 9,45% per year, compounded monthly. Jake would like to pay off his debt four years from now.

Question 6

The amount of money that Jake will have to pay Martha four years from *now* is

[1] R36 607,98.

[2] R45 181,81.

[3] R48 032,20.

[4] R54 278,92.

[5] R55 336,49.

Question 7

After seeing what he must pay Martha, Jake decides to reschedule his debt as two equal payments: one payment *now* and one three years from *now*. Martha agrees on condition that the new agreement, that will run from *now*, will be subjected to 10,67% interest, compounded quarterly. The amount that Jake will pay Martha three years from *now* is

[1] R21 171,35.

[2] R22 286,88.

[3] R25 103,93.

[4] R32 500,00.

[5] none of the above.

Question 8

If R35 000 accumulates to R48 320 at a continuous compounded rate of 8,6% per year, then the term under consideration is

[1] 2,77 years.

[2] 3,75 years.

[3] 3,91 years.

[4] 4,43 years.

[5] 6,23 years.

Question 9

Nicolet wants to buy a new state of the art computer for R35 000. She decides to save by depositing an amount of R500 once a month into an account earning 11,32% interest per year, compounded monthly. The approximate time it will take Nicolet to have R35 000 available is

[1] 40 months.
[2] 54 months.
[3] 70 months.
[4] 115 months.
[5] none of the above.

Question 10

If money is worth 12% per annum, compounded monthly, how long will it take the principal P to double?

[1] 6,12 years
[2] 7,27 years
[3] 8,33 years
[4] 69,66 years
[5] None of the above

Question 11

Paul decides to invest R140 000 into an account earning 13,5% interest per year, compounded quarterly. This new account allows him to withdraw an amount of money every quarter for 10 years after which time the account will be exhausted. The amount of money that Paul can withdraw every quarter is

[1] R1 704,28.
[2] R3 500,00.
[3] R6 429,28.
[4] R8 594,82.
[5] none of the above.

Question 12

If 15% per year, interest is compounded every two months, then the equivalent weekly compounded rate is

[1] 14,464%.
[2] 14,484%.
[3] 14,816%.
[4] 14,837%.
[5] none of the above.

Question 13

Nkosi owes Peter R3 000 due 10 months from now, and R25 000 due 32 months from now. Nkosi asks Peter if he can discharge his obligations by two equal payments: one now and the other one 28 months from now. Peter agrees on condition that a 14,75% interest rate, compounded every two months, is applicable. The amount that Nkosi will pay Peter 28 months from now is approximately

[1] R11 455.

[2] R11 511.

[3] R11 907.

[4] R14 000.

[5] R20 000.

Question 14

The accumulated amount after eight years of monthly payments of R1 900 each into an account earning 9,7% interest per year, compounded monthly, is

[1] R126 532,64.

[2] R182 400,00.

[3] R274 069,25.

[4] R395 077,74.

[5] none of the above.

Question 15

A saving account pays interest at the rate of 5% per year, compounded semi-annually. The amount that should be deposited now so that R250 can be withdrawn at the end of every six months for the next 10 years is

[1] R1 930,43.

[2] R3 144,47.

[3] R3 897,29.

[4] R6 386,16.

[5] none of the above.

2.3 Compulsory Assignment 03

Due Date: 29 March 2018

Unique Number: 656421

Please work through the following before answering the assignment questions:

- Study guide: Chapters 4 – 5 in the study guide
- Self evaluation exercises week 3 under Additional Resources on myUnisa

This assignment **MUST** be submitted via myUnisa.

Question 1

An amount of R600 is invested every month for eight years. The applicable interest rate is 14,65% per year, compounded quarterly. The accumulated amount of these monthly payments is approximately

[1] R57 600.

[2] R107 500.

[3] R108 400.

[4] R109 300.

[5] R321 200.

Question 2

At the beginning of each month an amount of X rand is deposited into a savings account earning $k \times 100\%$ interest per year, compounded monthly. The future value of these savings after 24 deposits can be denoted by

[1] $S = Xs_{\overline{24}|k}$.

[2] $S = X(1 + \frac{k}{12})^{24}$.

[3] $S = (1 + k)Xs_{\overline{24}|k}$.

[4] $S = (1 + \frac{k}{12})Xs_{\overline{24}|k \div 12}$.

[5] none of the above.

Question 3

Bobby borrowed money that must be repaid in nine payments. The first four payments of R2 000 each are paid at the *beginning* of each year. Thereafter five payments of R5 000 each are paid at the end of each year. Note there is only one payment per year. If money is worth 6,85% per year, then the present value of these payments is

[1] R22 588,92.

[2] R23 054,54.

[3] R27 381,02.

[4] R27 845,64.

[5] R33 000,00.

Question 4

Amy is going to need R145 000 in three years' time, to pay for a holiday overseas. She *immediately starts* to make monthly deposits into an account earning 11,05% interest per year, compounded monthly. Amy's monthly deposit is

[1] R3 384,18.

[2] R3 415,34.

[3] R4 027,78.

[4] R4 707,20.

[5] R4 750,55.

Question 5

After an accident Charl was awarded an amount from the Accident Fund as compensation for his injuries. He chose to receive R18 900 per month indefinitely. If money is worth 9,95% per year, compounded monthly, then the amount awarded is approximately

[1] R189 950.

[2] R2 279 397.

[3] R6 565 554.

[4] R7 252 333.

[5] none of the above.

Questions 6 and 7 relate to the following situation:
Solly will discharge a debt of R500 000 six years from now, using the sinking fund method. The debt's interest is 15,6% per year, paid quarterly. The sinking fund earns interest at a rate of 8,4% per year, compounded monthly.

Question 6

The monthly deposit into the sinking fund is

[1] R4 236,10.

[2] R5,364,60.

[3] R10 736,10.

[4] R12 958,53.

[5] R16 235,96.

Question 7

The total yearly cost to discharge the debt (to the nearest rand) is

[1] R42 000.

[2] R78 000.

[3] R93 834.

[4] R128 833.

[5] R142 375.

Question 8

Monthly deposits of R100 each are made into a bank account earning interest at an interest rate of 18% per annum, compounded monthly. The time (in months) that it will take the account to accumulate to R20 000 is given by

[1] $n = \dfrac{\ln[200(0{,}015) + 1]}{\ln(1 + 0{,}015)}$.

[2] $n = \dfrac{\ln[200(1{,}015)]}{0{,}015}$.

[3] $n = \ln[200(1{,}015) + 1] - \ln(1{,}015)$.

[4] $n = \dfrac{\ln[200(0{,}015) - 1]}{\ln(1 + 1{,}015)}$.

[5] none of the above.

Questions 9, 10 and 11 relate to the following situation:
The following is an extract from the amortisation schedule of a home loan:

Month	Outstanding principal at month beginning	Interest due at month end	Monthly payment	Principal repaid	Outstanding principal at month end
147	R8 155,83	A	R2 080,54	R2 014,27	R6 141,56
148	R6 141,56	R49,90	R2 080,54	R2 030,64	B
149	B	R33,40	R2 080,54	R2 047,14	R2 063,78
150	R2 063,78	R16,77	R2 080,54	R2 063,77	0

Question 9

The value of A is

[1] R41,65.

[2] R49,50.

[3] R66,27.

[4] R166,33.

[5] R167,86.

Question 10

The value of B is

[1] R4 061,02.

[2] R4 077,79.

[3] R4 094,21.

[4] R4 110,92.

[5] R4 127,68.

Question 11

If the interest rate has never changed, the original amount of the home loan (rounded to the nearest thousand rand) is

[1] R21 000,00.

[2] R180 000,00.

[3] R310 000,00.

[4] R312 000,00.

[5] R606 000,00.

Questions 12 and 13 relate to the following situation:
Jay intends to open a small material shop and borrows the money for it from his Uncle Jossop. Jay feels that he will only be able to start repaying his debt after three years. Jay will then pay Uncle Jossop R105 000 per year for five years. Money is worth 19,5% per year.

Question 12

The present value of Jay's debt at the time he will start paying Uncle Jossop back is

[1] R222 924,04.
[2] R317 500,78.
[3] R408 978,93.
[4] R436 649,07.
[5] R525 000,00.

Question 13

The amount of money that uncle Jossop originally lent Jay is

[1] R98 346,23.
[2] R130 288,26.
[3] R130 633,09.
[4] R184 589,43.
[5] R186 054,89.

Question 14

You are saving to pay for your children's university costs in 20 years' time. Your payment the first year is R3 600, after which your yearly payments increased by R360 each year. If the expected interest rate per year is 10%, the amount that you expect to receive to the nearest rand on the maturity date will be

[1] R213 030.
[2] R340 380.
[3] R412 380.
[4] R484 380.
[5] none of the above.

Question 15

Cindy bought a house and managed to secure a home loan for R790 000 with monthly payments of R9 680,70 at a fixed interest rate of 13,75% per year, compounded monthly, over a period of 20 years. If an average yearly inflation rate of 9,2% is expected, then the real cost of the loan (the difference between the total value of the loan and the actual principal borrowed) is

[1] R87 126.

[2] R201 642.

[3] R270 749.

[4] R588 358.

[5] R1 060 749.

2.4 Compulsory Assignment 04

Due Date: 18 April 2018

Unique Number: 833329

Please work through the following before answering the assignment questions:

- Study guide: Chapters 6, 7 and 8 in the study guide
- Self evaluation exercises week 4, 5 and 6 under Additional Resources on myUnisa

This assignment **MUST** be submitted via myUnisa.

Questions 1 and 2 relate to the following situation:
Down-To-Earth sells houses. The following table represents the selling price of a house (y) in thousands of rands and the number of houses sold at that price (x).

x	*5*	*15*	*19*	*7*
y	*500*	*900*	*1 500*	*2 000*

Question 1

The standard deviation for the number of houses sold is

[1] 4,0.
[2] 5,7.
[3] 6,6.
[4] 11,5.
[5] none of the above.

Question 2

The correlation coefficient of a linear regression between x and y is approximately

[1] $-0{,}16$.
[2] 0,16.
[3] 4,00.
[4] 5,72.
[5] none of the above.

Questions 3 and 4 relate to the following situation:
The following table represents the cash inflows of a boutique for nine years.

Year	***Cash inflow*** *(R)*
3	*45 000*
6	*90 000*
9	*115 000*

The applicable interest rate is 11,59% per year. The present value of the cash outflows is R95 000.

Question 3

The future value of the cash inflows is approximately

[1] R169 330.
[2] R218 000.
[3] R250 000.
[4] R271 470.
[5] R326 950.

Question 4

The MIRR is

[1] 14,72%.
[2] 21,25%.
[3] 31,90%.
[4] 38,06%.
[5] 41,91%.

Question 5

Consider Bond F234

Coupon rate (half yearly)	10,5% per year
Yield to maturity	7,955% per year
Maturity date	8 October 2052
Settlement date	29 May 2018

The all-in-price is

[1] R123,49852%.
[2] R126,13814%.
[3] R129,73733%.
[4] R131,24248%.
[5] R134,98733%.

Question 6

The equation for the present value of Bond AAA on 17/06/2018 is given by

$$107{,}55174 = da_{\overline{n}|z} + 100\left(1 + \frac{0{,}135}{2}\right)^{-29}.$$

The yearly coupon rate is

[1] 6,75%.

[2] 7,35%.

[3] 8,55%.

[4] 14,70%.

[5] none of the above.

Questions 7 and 8 relate to the following situation:
Consider Bond ABC

Coupon rate:	*9,75% per year*
Yield to maturity:	*11,4% per year*
Maturity date:	*15 April 2042*
Settlement date:	*29 November 2016*

Question 7

The accrued interest is

[1] R1,18207%.

[2] R1,20205%.

[3] R2,34537%.

[4] R5,87781%.

[5] none of the above.

Question 8

The clean price is

[1] R81,69720%.

[2] R85,22964%.

[3] R86,37296%.

[4] R86,39294%.

[5] R88,77706%.

Question 9

If the NPV (Net Present Value) of a shop is R195 000 and the profitability index is 1,24375, the initial investment in the shop is

[1] R86 908.

[2] R156 784.

[3] R195 000.

[4] R800 000.

[5] none of the above.

Question 10

An estate agent suspects that there is a linear relationship between the number of houses sold and the monthly loan payments. She analyses the following data over the past six months.

Number of houses sold	**Monthly loan payments (in R1 000's)**
x	y
160	3,7
250	5,6
800	7,5
450	11,3
120	18,9
50	28,4

The regression line equation is

[1] $y = -0{,}016x + 17{,}45$.

[2] $y = 17{,}45x - 0{,}016$.

[3] $y = -13{,}99x + 480{,}89$.

[4] $y = 480{,}89x - 13{,}99$.

[5] none of the above.

Question 11

The next coupon date that follows the settlement date of a bond is 28 October 2018. The half-yearly coupon rate is 7,375%. The accrued interest equals R5,49589%. If this is a cum interest case, the settlement date for this bond is

[1] 14 June 2018.

[2] 30 July 2018.

[3] 29 August 2018.

[4] 11 September 2018.

[5] none of the above.

Question 12

An investment with an initial outlay of R500 000 generates five successive annual cash inflows of R75 000, R190 000, R40 000, R150 000 and R180 000 respectively. The internal rate of return (IRR) is

[1] 7,78%.

[2] 9,48%.

[3] 21,3%.

[4] 27,0%.

[5] none of the above.

Question 13

The following figures show the profit of a greengrocer for the past five years: R360 000, R550 000, R200 000, R80 000 and R700 000. The arithmetic mean of the data is

[1] R225 424.

[2] R252 032.

[3] R378 000.

[4] R1 890 000.

[5] none of the above.

Question 14

You must choose between two investments, A and B. The profitability index (PI), net present value (NPV) and internal rate of return (IRR) of the two investments are as follows:

Criteria	**Investment A**	**Investment B**
NPV	R44 000	−R22 000
PI	1,945	0,071
IRR	16,00%	8,04%

Which investment(s) should you choose, taking all the above criteria into consideration, if the cost of capital is equal to 12% per year?

[1] A

[2] B

[3] Both A and B

[4] Neither A nor B

[5] Too little information to make a decision

Question 15

The following table represents the annual income (after tax) of an investment:

Years	After-tax income R
1	200 000
2	500 000
3	300 000
4	400 000
5	700 000
6	300 000

If the average rate of return is 8,421%, then the original investment (rounded off to the nearest thousand rand) was

[1] R40 000.

[2] R1 497 000.

[3] R2 400 000.

[4] R4 750 000.

[5] none of the above.

Chapter 3

Second semester compulsory assignments

Assignment 01 must be submitted by its due date to obtain admission to the examination

3.1 Compulsory Assignment 01

Due Date: 07 August 2018

Unique Number: 862126

Please work through the following before answering the assignment questions:

- Study guide: Chapters 2 – 3.2 in the study guide
- Self evaluation exercises week 1 and 2 under Additional Resources on myUnisa

This assignment **MUST** be submitted via myUnisa.

Question 1

On 29 March 2018 Augusta deposited R3 500 into a savings account. The simple interest rate agreed upon was 7,5% per year. The accumulated amount in the savings account on 10 October 2018 is

[1] R3 637,88.

[2] R3 640,24.

[3] R3 643,09.

[4] R3 646,09.

[5] none of the above.

Question 2

Bobo borrows money from the bank at a simple discount rate of 9,75% per year. She must pay the bank R35 000 in 27 months' time. The amount of money that she receives from the bank now is

[1] R27 321,88.

[2] R28 389,51.

[3] R28 703,23.

[4] R42 678,13.

[5] R44 835,87.

Question 3

Bokkie wants to buy a Persian carpet. She has five interest rates to choose from if she borrows the money from the bank. The cheapest option for her is

[1] 29% per year, compounded monthly.

[2] 29,5% per year, compounded every two months.

[3] 30% per year, compounded semi-annually.

[4] 28,5% per year, compounded weekly.

[5] 29% per year, compounded daily.

Question 4

The present value of a loan of R12 000 due in five years' time, at a simple discount rate of 15% per annum is

[1] R3 000,00.

[2] R5 324,46.

[3] R24 136,29.

[4] R48 000,00.

[5] none of the above.

Question 5

The simple interest rate which is equal to a discount rate of 12% per year for a period of 18 months is

[1] 0,12%.

[2] 10,34%.

[3] 12,00%.

[4] 14,63%.

[5] none of the above.

Question 6

Shaun receives R1 500,00 from the bank now that charge 10,5% simple discount per year. He has to pay back the bank an amount of R1 893,75 in a few months' time. The number of months after which Shaun pays back the loan, rounded to one decimal place, is

[1] 2,0.
[2] 2,5.
[3] 24,0.
[4] 30,0.
[5] none of the above.

Question 7

The accumulated amount that Mabe will receive after 38 months if she deposits R13 300 into an account where money is worth 11,35% per year, compounded every two months is

[1] R14 117,08.
[2] R15 690,19.
[3] R18 080,24.
[4] R18 865,83.
[5] R18 988,31.

Question 8

If the nominal interest rate is 16,5% per annum, compounded at the end of every second month, then the effective interest rate is

[1] 14,53%.
[2] 17,18%.
[3] 16,68%.
[4] 17,68%.
[5] none of the above.

Question 9

An investment of R20 000 accumulated to R45 200. If the applicable simple interest rate is 12% per year, then the time under consideration is

[1] 3,25 years.
[2] 4,65 years.
[3] 7,19 years.
[4] 10,50 years.
[5] none of the above.

Question 10

Karin won R165 000 and decided to deposit 65% of this amount in an account earning 8,25% interest per year, compounded every four months. The accumulated amount after five years is

[1] R151 490,63.

[2] R161 110,84.

[3] R161 332,31.

[4] R247 862,83.

[5] R248 203,55.

Question 11

Having received a large inheritance, Karena's parents wish to establish a trust for his university education. They need an estimated R70 000, 15 years from now. The amount they should set aside in the trust now, if they invest the money at 18,5% per year compounded every 3 months, is

[1] R4 644,83.

[2] R4 738,38.

[3] R28 528,26.

[4] R35 527,61.

[5] none of the above.

Question 12

An effective rate of 29,61% corresponds to a nominal rate, compounded weekly, of

[1] 26%.

[2] 29,53%.

[3] 29,61%.

[4] 34,35%.

[5] none of the above.

Questions 13 and 14 are based on the following information:
John deposits R900 into a savings account paying 6,5% interest per year, compounded quarterly. After three and a half years he withdraws R1 000 from the account and deposits it into a second account paying 11% simple interest per year.

Question 13

How much is the total amount accrued in the first account two years after withdrawing the R1 000? The correct answer, rounded to the nearest rand, is

[1] R128.

[2] R605.

[3] R1 105.

[4] R145.

[5] none of the above.

Question 14

A number of years after John deposited the R1 000 into the second account, the accrued amount in the second account is R1 605. The time (correct to two decimal places) the money was invested for, is

[1] 4,53 years.

[2] 4,36 years.

[3] 5,50 years.

[4] 9,31 years.

[5] none of the above.

Question 15

Mario owes Sweetness R500 due in four months' time and R700 due in nine months' time. He wants to liquidate these obligations with a single payment in 12 months' time. If a simple interest rate of 11% per year, is charged on all the amounts, the amount he will pay Sweetness in 12 months' time is

[1] R1 255,92.

[2] R1 276,08.

[3] R1 228,42.

[4] R1 200,00.

[5] none of the above.

3.2 Compulsory Assignment 02

Due Date: 22 August 2018

Unique Number: 771649

Please work through the following before answering the assignment questions:

- Study guide: Chapters 3 – 4.2 in the study guide
- Self evaluation exercises week 2 and 3 under Additional Resources on myUnisa

This assignment **MUST** be submitted via myUnisa.

Question 1

Fatima needs R150 000 on 17 November 2017 to upgrade her deli. On 8 January 2017 she deposited an amount into an account earning 13,45% interest per year, compounded monthly, and being credited on the 1st of every month. If fractional compounding is used for the full term, then the amount that Fatima deposited on 8 January 2017 was

[1] R133 662,53.

[2] R133 708,72.

[3] R133 745,47.

[4] R168 230,00.

[5] R168 276,24.

Question 2

The continuous compounding rate is 13,974% per year. The equivalent nominal rate, compounded every three months, is

[1] 13,658%.

[2] 13,735%.

[3] 14,221%.

[4] 14,305%.

[5] 14,997%.

Question 3

To pay off a loan of R7 000 due now and a loan of R2 000 due in 14 months' time, Lucky agrees to make three payments in two, five and ten months' time respectively. The second payment is to be double the first and the third payment is to be triple the first. What is the size of the payment at month five if interest is calculated at 16% per year, compounded monthly?

[1] R1 582,43

[2] R3 000,00

[3] R3 164,86

[4] R4 500,00

[5] R4 627,26

Question 4

If R35 000 accumulates to R48 320 at a continuous compounded rate of 8,6%per year, then the term under consideration is

[1] 2,77 years.

[2] 3,75 years.

[3] 3,91 years.

[4] 4,43 years.

[5] 6,23 years.

Question 5

Quarterly deposits of R400 each are made into a bank account earning interest at 16% per year, compounded quarterly. The approximate time (in number of quarters) that it will take for the account to accumulate to R40 000 is

[1] 41 quarters.

[2] 28 quarters.

[3] 2 quarters.

[4] 40 quarters.

[5] 12 quarters.

Question 6

Six years ago Trevor lent Maria R150 000 on condition that she would pay him back in nine years time. The applicable interest rate is 15,5% per year, compounded monthly. Maria also owes Trevor another amount of R250 000 that she has to pay back six years from *now* for a loan that earned interest at 16,4% per year, compounded half-yearly. Maria asks Trevor if she can settle both her debts three years from *now*. The total amount that Maria will have to pay Trevor three years from *now* is

[1] R400 000,00.

[2] R475 017,72.

[3] R488 092,15.

[4] R755 667,10.

[5] R777 202,69.

Question 7

Mike deposits R1 500 at the end of every month into an account that earns 12,5% interest per year, compounded monthly. After two years, he stops making these monthly contributions because the interest rate changes to 15% per year, compounded every two months. If no withdrawals or deposits are made for four years the balance in the account will be

[1] R40 660,72.

[2] R62 224,96.

[3] R65 114,13.

[4] R72 517,49.

[5] none of the above.

Question 8

The Treasure Fund was created for Long John after he lost his leg in a battle with pirates. The fund has undertaken to pay him R1 200 000 now. Long John prefers to receive three payments: one three years from now; one twice the size of the first payment six years from now, and one four times the size of the first payment ten years from now. The amount of money to the nearest rand that John can expect to receive six years from now if the interest rate changes to 8,6% per year, compounded quarterly, will be

[1] R325 803.

[2] R333 235.

[3] R651 606.

[4] R666 470.

[5] R1 303 212.

Question 9

An amount of money accumulates to R45 946 at a continuous compounding rate of 8% per year, after 57 months. The original amount is

[1] R28 486,52.

[2] R31 420,70.

[3] R31 460,34.

[4] R33 294,20.

[5] R36 756,80.

Question 10

If $R = \dfrac{x}{s_{\overline{18}|0,15}}$ is simplified, then the equation becomes

[1] $R = x$.

[2] $R = 0{,}01319x$.

[3] $R = 0{,}16319x$.

[4] $R = 6{,}12797x$.

[5] $R = 75{,}83638x$.

Question 11

An interest rate of 14,90% per year, compounded quarterly, is equivalent to a weekly compounded interest rate of

[1] 14,65%.

[2] 14,88%.

[3] 15,16%.

[4] 19,02%.

[5] none of the above.

Question 12

Superman decides that he would like to buy his lovely wife, Superwoman, a new car when she turns 30 in six years' time. He deposits R6 000 each month into an account earning 8,94% interest per year, compounded monthly. The amount that Superman (rounded to the nearest rand) will have available six years from now is

[1] R333 412.

[2] R335 896.

[3] R432 000.

[4] R568 948.

[5] R573 187.

Question 13

A nominal interest rate of 19,40% per year, compounded monthly, is equivalent to a continuous compounding rate of

[1] 19,40%.

[2] 19,56%.

[3] 21,22%.

[4] 21,41%.

[5] none of the above.

Question 14

Three years ago Moodley borrowed R10 000 from Linda on condition that he should pay her back two years from now. He also owes Linda R6 000 payable five years from now. The applicable interest rate for both transactions is 13,75% per year, compounded half yearly. After considering his payback schedule, Moodley asks Linda if he can pay her R9 000 now and the rest in four years' time. She agrees on condition that the new agreement will run from now and that an interest rate of 16,28% per year, compounded monthly, will be applicable from now. The amount that Moodley will have to pay Linda four years from now is

[1] R8 988,38.

[2] R13 366,24.

[3] R15 245,21.

[4] R17 162,98.

[5] R23 430,38.

Question 15

A loan will be paid back by means of payments of R25 000 each every second month for six years. An interest rate of 7,5% per year, compounded every two months, will be applicable. The present value of the loan is

[1] R238 067,35.

[2] R400 738,72.

[3] R721 181,68.

[4] R900 000,00.

[5] R1 127 887,64.

3.3 Compulsory Assignment 03

Due Date: 06 September 2018

Unique Number: 830328

Please work through the following before answering the assignment questions:

- Study guide: Chapters 4 – 5 in the study guide
- Self evaluation exercises week 3 under Additional Resources on myUnisa

This assignment **MUST** be submitted via myUnisa.

Question 1

Monthly payments of R1 200 are made into an account earning 7,75% interest per year, compounded quarterly. The accumulated amount rounded to the nearest hundred rand after 10 years is

[1] R144 000.

[2] R215 900.

[3] R216 500.

[4] R291 100.

[5] none of the above.

Question 2

On her 40th birthday Susan decides that she will go for a facelift when she turns 50. She estimates that it will cost her R48 000 when she turns 50. She starts *saving immediately* each month paying an amount into an account earning 8,58% interest per year, compounded monthly. The monthly payment is

[1] R252,18.

[2] R253,99.

[3] R255,80.

[4] R592,95.

[5] R597,19.

Question 3

You borrowed an amount of money from your father. The loan will be paid back by means of payments of R25 000 each every second month for six years. An interest rate of 7,5% per year, compounded every two months, will be applicable. The amount of the loan is

[1] R238 067,35.

[2] R400 738,72.

[3] R721 181,68.

[4] R900 000,00.

[5] R1 127 887,64.

Question 4

If $S = (1+i)^n P$ and $P = R\left[\frac{(1+i)^n - 1}{i(1+i)^n}\right]$, then S also equals

[1] $Rs_{\overline{n}|i}$.

[2] $(1+i)Rs_{\overline{n}|i}$.

[3] $(1+i)Ra_{\overline{n}|i}$.

[4] $(1+i)\left(1+\frac{j_m}{m}\right)^{tm}$.

[5] $(1+i)^n$.

Questions 5 and 6 are based on the following situation:
The Gliding Fund must pay Weaver R18 000 every three months indefinitely as compensation. Money is worth 11,4% per year, compounded quarterly.

Question 5

The opening balance of this fund is approximately

[1] R157 895.

[2] R474 536.

[3] R631 579.

[4] R1 105 351.

[5] none of the above.

Question 6

Weaver asks to reschedule the compensation in three payments, the first payment *now*, the second payment twice the size of the first payment four years from *now*, and the third payment three times the size of the first payment nine years from *now*. The Gliding Fund agrees on condition that the interest rate changes to 10,95% per year, compounded monthly. The amount to the nearest hundred rand that Weaver can expect to receive four years from *now* is

[1] R184 800.

[2] R369 600.

[3] R557 510.

[4] R864 000.

[5] none of the above.

Question 7

The present value of an annuity is R62 543,42. The time under consideration is 10 years and the applicable interest rate is 16% per year, compounded monthly. The future value of this annuity is

[1] R162 612,89.

[2] R306 521,61.

[3] R581 913,00.

[4] R625 434,20.

[5] R1 333 517,61.

Questions 8 and 9 are based on the following situation:
The last six payments of a loan are reflected in the following amortisation schedule.

Month	***Outstanding principal at the beginning of the month***	***Interest due at the end of the month***	***Payment***	***Principal repaid***
175	*49 694,10*	*422,40*	*8 530,49*	*8 108,09*
176	*A*	*353,48*	*8 530,49*	*F*
177	*33 409,01*	*C*	*8 530,49*	*G*
178	*25 162,50*	*D*	*8 530,49*	*8 316,61*
179	*B*	*143,19*	*8 530,49*	*H*
180	*8 458,59*	*E*	*8 530,49*	*I*

Question 8

The applicable interest rate per year (compounded monthly) is

[1] 4,95%.
[2] 5,2%.
[3] 8,5%.
[4] 10,2%.
[5] 12,70%.

Question 9

The value of A is

[1] R40 540,45.
[2] R40 810,13.
[3] R41 163,61.
[4] R41 586,01.
[5] R42 652,45.

Question 10

Trivina took out an endowment policy. The first annual payment was Rx, whereafter it increased yearly by R1 700. After 20 years the policy paid out R1 005 962. The applicable yearly interest rate is 10%. The value of x is approximately

[1] R564.
[2] R6 500.
[3] R11 816.
[4] R17 564.
[5] R23 500.

Questions 11 and 12 are based on the following situation:
Carin wants to open the Straight Hair Salon and asks her Aunt Wilma if she will lend her the money. She also indicates that she will only be able to start paying her back after five years, at which time she will then pay R35 000 at the end of every four months, for four years. Aunt Wilma agrees, on condition that her money must earn 12,2% interest per year, compounded every four months.

Question 11

The present value of Carin's debt when she starts paying back Aunt Wilma will be

[1] R387 335,79.
[2] R420 000,00.
[3] R437 962,78.
[4] R518 312,63.
[5] none of the above.

Question 12

The amount that Aunt Wilma lends Carin is

[1] R179 950,37.
[2] R202 809,21.
[3] R213 016,36.
[4] R240 147,06.
[5] R284 205,10.

Question 13

Ester is getting married 16 months from *now* and estimates that she will need R45 000 for new clothes for her honeymoon. She starts to save *immediately* by depositing R2 200 every month for 16 months into an account earning 15,4% interest per year, compounded monthly. The amount, in rands, that she still needs when she gets married is denoted by

[1] $X = 45\,000 - 2\,200a_{\overline{16}|0,154\div 12}$.
[2] $X = 45\,000 - 2\,200s_{\overline{16}|0,154\div 12}$.
[3] $X = 45\,000 - (1+i)2\,200a_{\overline{16}|0,154\div 12}$.
[4] $X = 45\,000 - (1+i)2\,200s_{\overline{16}|0,154\div 12}$.
[5] $X = 45\,000 - 2\,200s_{\overline{17}|0,154\div 12}$.

Questions 14 and 15 are based on the following situation:
John buys a house and makes a down payment of 16% of the price of the house. For the remaining amount, he manages to secure a loan at an interest rate of 12,05% per year, compounded monthly, for a period of 20 years. His monthly payment is R18 556,84.

Question 14

The size of the loan (to the nearest rand) is

[1] R1 333 820.
[2] R1 680 000.
[3] R2 167 317.
[4] R4 453 642.
[5] none of the above.

Question 15

The down payment is

[1] R213 411.
[2] R254 061.
[3] R268 800.
[4] R320 000.
[5] R346 771.

3.4 Compulsory Assignment 04

Due Date: 26 September 2018

Unique Number: 654698

Please work through the following before answering the assignment questions:

- Study guide: Chapters 6, 7 and 8 in the study guide
- Self evaluation exercises week 4, 5 and 6 under Additional Resources on myUnisa

This assignment **MUST** be submitted via myUnisa.

Questions 1 and 2 are based on the following situation:
The following table represents the cash flows (in rand) of a company.

Year	*Cash flows*
3	*40 000*
5	*−70 000*
7	*−80 000*
9	*10 000*
11	*100 000*

Money can be borrowed at 14,25% per year and investments can earn 8,27% per year.

Question 1

The present value of the cash outflows is

[1] R67 444,26.
[2] R92 920,21.
[3] R122 557,45.
[4] R132 898,63.
[5] none of the above.

Question 2

If the future value of the cash inflows is R187 253,00, then the MIRR is

[1] 8,85%.
[2] 9,73%.
[3] 13,62%.
[4] 22,66%.
[5] none of the above.

Questions 3, 4 and 5 are based on the following situation:
An investment with an initial outlay of R500 000 generates five successive annual cash inflows of R75 000, R190 000, R40 000, R150 000 and R180 000 respectively. The cost of capital K is 10% per annum.

Question 3

The internal rate of return (IRR) is

[1] 7,78%.
[2] 9,48%.
[3] 21,3%.
[4] 27,0%.
[5] none of the above.

Question 4

The net present value (NPV) is approximately

[1] R74 500.
[2] R135 000.
[3] −R135 000.
[4] −R30 523.
[5] none of the above.

Question 5

The profitability index (PI) is

[1] 0,27000.
[2] 0,34369.
[3] 0,65631.
[4] 0,93895.
[5] none of the above.

Question 6

The square root of the ..... is called the standard deviation. The missing word is

[1] coefficient.
[2] correlation.
[3] coefficient of determination.
[4] sample.
[5] variance.

Questions 7, 8 and 9 are based on the following situation:
The following table supplies data of the inflation rate and the corresponding prime lending rate during the same time period.

Inflation rate (%)(x)	***Prime lending rate (%)(y)***
3,3	*5,2*
6,2	*8,0*
11,0	*10,8*
9,1	*7,9*
5,8	*6,8*
6,5	*6,9*
7,6	*9,0*

Question 7

The linear relationship between the inflation rate and the prime lending rate can be represented by the regression line

[1] $y = 3{,}17477 + 0{,}65407x$.
[2] $y = 0{,}65407 + 3{,}17477x$.
[3] $y = -2{,}76656 + 1{,}26128x$.
[4] $y = 1{,}26128 - 2{,}76656x$.
[5] $y = 2{,}28372 + 0{,}88372x$.

Question 8

The correlation coefficient is

[1] $-0{,}908$.
[2] $+0{,}495$
[3] $+0{,}546$.
[4] $+0{,}908$.
[5] none of the above.

Question 9

The coefficient of determination is

[1] 0,24503.
[2] 0,29812.
[3] 0,82446.
[4] not solvable.
[5] none of the above.

Questions 10, 11 and 12 are based on the following situation:
Consider BOND ABC

Coupon rate:	*9,4% per year*
Yield to maturity:	*10,6% per year*
Settlement date:	*16 July 2018*
Maturity date:	*9 October 2044*

Question 10

The all-in price is

[1] R82,63215%.

[2] R87,33105%.

[3] R89,45121%.

[4] R91,91965%.

[5] R94,15121%.

Question 11

The accrued interest is

[1] R2,18904%.

[2] R2,51694%.

[3] R2,52384%.

[4] R4,36612%.

[5] none of the above.

Question 12

The clean price is

[1] R84,80721%.

[2] R86,92737%.

[3] R87,26217%.

[4] R89,39581%.

[5] R89,73061%.

Question 13

The settlement date of Bond E528 is 23 May 2018.
The price on the coupon date that follows the settlement date is denoted by

$$\begin{aligned} P &= \frac{12{,}4}{2} a_{\overline{n}|0{,}108 \div 2} + 10{,}41966. \\ \text{The all-in price} &= 119{,}47116 \left(1 + \frac{0{,}108}{2}\right)^{-20/182}. \end{aligned}$$

The maturity date of Bond E528 is

[1] 12 June 2039
[2] 25 November 2039.
[3] 12 December 2039.
[4] 23 November 2046.
[5] 12 December 2046.

Question 14

The equation for the present value of stock CCC on 17 December 2018 is given by

$$107{,}55174 = d a_{\overline{29}|\frac{0{,}135}{2}} + 100 \left(1 + \frac{0{,}135}{2}\right)^{-29}.$$

The half-yearly coupon rate d is equal to

[1] 6,75%.
[2] 7,35%.
[3] 8,55%.
[4] 14,70%.
[5] none of the above.

Question 15

A ..... is a representative group or subset of the population. It is the portion of the population that is selected for analysis. The missing word is

[1] deviation.
[2] mean.
[3] regression.
[4] sample.
[5] variance.