Tutorial letter 001/3/2021

Elementary Quantitative Methods

QMI1500

Semester 1 and 2

Department of Decision Sciences

Important information

This is an online module. Please register on myUnisa, activate your myLife email address and make sure that you have regular access to the myUnisa module website, QMI1500-2021-S1.

Bar code

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1 ASSESSMENT CHANGES FOR 2021 ACADEMIC YEAR

Dear Student

Due to the ministerial request to extend the 2021 registration dates, Unisa had to amend both the semester dates and the assessment arrangements for the 2021 academic year.

During 2021 we will have only one semester and only one tuition and assessment period. The purpose of this TL001 is to inform you of the new assessment requirements for module QMI1500 for students registered during 2021 for the one semester period.

2 ASSIGNMENTS

Assessment of your understanding and sound knowledge of the contents of this module will be through completion of *four* multiple choice assignments as well as a two-hour multiple choice examination.

There are four compulsory assignments. The marks of each of the four assignments will contribute towards your semester mark as indicated in the table below. All assignments must be submitted by the due dates. Late assignments will not be marked, which means that you will obtain a poor semester mark.

Your semester mark will contribute 20% towards your final mark for the module QMI1500.
The examination will contribute 80% towards your final mark for the module QMI1500.
You must obtain a subminimum of 40% in the examination before the semester mark is taken into account.
Your final mark for module QMI1500 must be at least 50% in order to pass.

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

2.1 Compulsory assignment due dates

Assignment	Topic	Type	Due dates	Weight
01	1.1 – 2.2	MCQ on myUnisa	25 May 2021	25%
02	2.3 – 4.4	MCQ on myUnisa	29 June 2021	25%
03	4.5 – 6.4	MCQ on myUnisa	3 August 2021	25%
04	1.1 – 6.4	MCQ on myExams	12 August 2021	25%

The unique numbers of the assignments will be published on the QMI1500 module site on myUnisa.

The assignment questions are published on the QMI1500 module site on myUnisa, under "**Additional Resources**". For the sake of convenience, this tutorial letter also contains only the questions for the first assignment.

2.2 Study schedule

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.

If you follow this schedule you will have enough time left to revise the study material before the examination.

Work covered	**Date**
Topic 1.1 to Topic 1.3	11 April to 17 April
Topic 1.4 to Topic 1.5	18 April to 24 April
Topic 1.6 to Topic 1.7	25 April to 1 May
Topic 1.8 to Topic 1.9	2 May to 8 May
Topic 2.1 to Topic 2.2	9 May to 22 May
Assignment 1	25 May
Topic 2.3 to Topic 2.4	23 May to 29 May
Topic 3.1 to Topic 3.2	30 May to 5 June
Topic 3.3 to Topic 3.4	6 June to 12 June
Topic 4.1 to Topic 4.2	13 June to 19 June
Topic 4.3 to Topic 4.4	20 June to 26 June
Assignment 2	29 June
Topic 4.5 to Topic 4.6	27 June to 3 July
Topic 5.1 to Topic 5.2	4 July to 10 July
Topic 5.3 to Topic 5.4	11 July to 17 July
Topic 5.5 to Topic 6.1	18 July to 24 July
Topic 6.2 to Topic 6.4	25 July to 31 July
Assignment 3	3 August
Revision and preparation	1 August to 11 August
Assignment 4	12 August

2.3 Assignment 4 format

The fourth assignment will be in the form of a mock exam. This assessment is to familiarise yourself with the process of writing online examinations.

You will do this assessment on the Online Assessment tool located in your module examination site in myExams. The Online Assessment tool will present the questions to you. Expect to be online for the full duration of the assessment. The assessment will be built from questions from the first three assignments. **All arrangements will be clearly communicated in good time.**

2.4 Assignment 1 questions

ASSIGNMENT 01

Study material: Topic 1.1 to 2.2 in the Study guide

Unique assignment number: **Will still be provided**

FIXED DUE DATE: 25 May 2021

Important:

- This is a multiple-choice assignment that must be answered and submitted ONLINE using myUnisa. Go to **Assessment Info** on the QMI1500 module site and follow the steps. Make sure that you complete the submission process.
- Always keep your detailed workings in a file to be able to compare your solutions to the ones that will be published on the QMI1500 module site on myUnisa after the due date. **Also, keep a copy of the options you have chosen, in case of a query.**
- The due date of this assignment is **fixed**. No extension can be granted because the solutions will be posted on the QMI1500 module site shortly after the closing date.

Question 1

Solving

$$7 + 3 \times 2^4 \div 8 - (9 - 6 \div 3)^2$$

gives

[1] 62.

[2] -36.

[3] -29.

[4] 168.

Question 2

If $a = -3$, $b = 4$ and $c = -5$, then by how much is the product abc greater than the sum $a + b + c$?

[1] -64

[2] 48

[3] 56

[4] 64

Question 3

Below are some statements and some fractions:

	Statement		Fractions
A.	$\frac{30}{75}$ reduced to lowest terms	1.	$\frac{4}{10}$
B.	a fraction with a numerator of 3 that is equivalent to $\frac{18}{30}$	2.	$-\frac{5}{3}$
C.	reciprocal of $\frac{5}{3}$	3.	$\frac{2}{3}$
D.	$1\frac{1}{4} \times -1\frac{1}{3} =$	4.	$\frac{2}{5}$
E.	0,4 expressed as a common fraction in simplest form	5.	$\frac{3}{5}$

Some of the statements may refer to the same fraction, therefore, a fraction can be used more than once. Match each statement with the correct fraction. Choose the correct option:

[1] A: 4; B: 5; C: 5; D: 2; E: 4

[2] A: 1; B: 3; C: 2; D: 2; E: 4

[3] A: 4; B: 5; C: 2; D: 3; E: 1

[4] A: 1; B: 3; C: 5; D: 5; E: 1

Question 4

Simplifying

$$\frac{\frac{2}{x} - 5}{6 + \frac{3}{x}}$$

gives

[1] $\frac{2 - 5x \div 6x + 3}{x}$.

[2] $-\frac{1 + x}{3\,(x - 1)}$.

[3] $\frac{30 - 5x}{6x}$.

[4] $\frac{2 - 5x}{3\,(2x + 1)}$.

Question 5

Jeffrey left $\frac{4}{7}$ of his estate to his wife and $\frac{1}{4}$ of the remainder to his granddaughter. The part of his estate that is not accounted for, given as a fraction, is

[1] $\frac{5}{28}$.

[2] $\frac{9}{28}$.

[3] $\frac{23}{28}$.

[4] $\frac{19}{28}$.

Question 6

Simplifying

$$\frac{2^{n+1}}{2^{n-2}}$$

gives

[1] $\frac{n+1}{n-2}$.

[2] $\frac{1}{8}$.

[3] $-\frac{1}{2}$.

[4] 8.

Question 7

The expression

$$\frac{\sqrt{48}}{4} + 6\sqrt{\frac{1}{12}} - \sqrt{27}$$

is NOT equal to

[1] $\frac{-3}{\sqrt{3}}$.

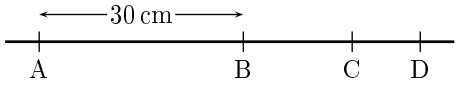
[2] $\sqrt{3} + \frac{3}{\sqrt{3}} - 3\sqrt{3}$.

[3] $\frac{-9}{\sqrt{3}}$.

[4] $\frac{3+3-3\times 3}{\sqrt{3}}$.

Question 8

The points A, B, C and D divide the line segment AD in the ratio $2\frac{1}{2} : 1\frac{1}{3} : \frac{5}{6}$, respectively, and AB = 30 cm:



What is the length of BD?

[1] 16 cm

[2] 10 cm

[3] 56 cm

[4] 26 cm

Question 9

Answer the following questions

a. If m men can move 500 boxes in one day, how many men will be needed to move x boxes in one day?

b. In a factory, 15 of every 300 light bulbs were defective. At the same rate, if 680 bulbs are tested, how many of them would not be defective?

Pick the option below that has both answers correct.

[1] a. $\frac{x}{500m}$; b. 650

[2] a. $\frac{500x}{m}$; b. 34

[3] a. $\frac{mx}{500}$; b. 646

[4] a. $\frac{500}{mx}$; b. 646

Question 10

A merchant purchased a line of handbags for R172,00 each. She wants to offer a 14% discount off the listed selling price and still make a 24% profit. The price that she should mark on the label is

[1] R248,00.

[2] R243,14.

[3] R258,00.

[4] R183,42.

Question 11

If $a > 0$ and $b < 0$, which one of the following must be true?

[1] $ab > 0$

[2] $a - b > 0$

[3] $b - a > 0$

[4] $a + b > 0$

Question 12

Writing the expression

$$\frac{5}{2}x^3 + 3x^4 + \frac{7}{2}x^5 + 4x^6$$

in sigma notation, gives

(i) $\displaystyle\sum_{k=5}^{8} \frac{k}{2}x^{k-2}$

(ii) $\displaystyle\sum_{k=1}^{4} \frac{k+4}{2}x^{k+2}$

(iii) $\displaystyle\sum_{k=3}^{6} \frac{k+2}{2}x^{k}$.

Which of the statement/s is/are true?

[1] Only (ii)

[2] Only (i)

[3] Only (i) and (iii)

[4] (i), (ii) and (iii)

Question 13

In a lottery, players must match five numbers plus a bonus number. Five white balls are chosen from 59 white balls numbered from 1 to 59, and one red ball (the bonus number) is chosen from 35 red balls numbered 1 to 35. How many different results are possible?

[1] 5 006 386

[2] 5 006 421

[3] 175 223 510

[4] 600 766 355

Question 14

The width of a rectangular tank is x cm. Its height is $\frac{2}{3}$ its width and its length is four times its height. The volume of the tank (in litres) is

[1] $\frac{16}{9}x^3\,\ell.$

[2] $\frac{8}{3}x^3\,\ell.$

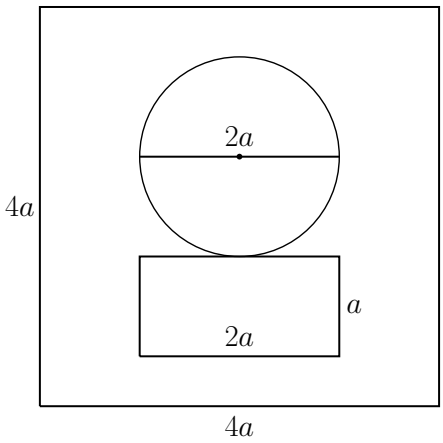
[3] $\frac{16}{9}x^3 \times 10^{-3}\,\ell.$

[4] $\frac{8}{3}x^3 \times 10^{3}\,\ell.$

Question 15

Hint: The area of a circle is calculated as πr^2.

A square sheet of metal with sides $4a$ has a circle of diameter $2a$ and a rectangle of length $2a$ and width a removed from it:



The area of the remaining metal is

[1] $14a^2 - \pi a^2.$

[2] $4a - 4\pi a^2 - 2a^2.$

[3] $14a^2 - 4\pi a^2.$

[4] $4a^2 + \pi a^2 - a.$

Question 16

There exists a relationship between x and y. In the following tables the independent variable is represented by x and the dependent variable is represented by y:

P

x	y
-2	-3
1	3
3	-3
5	3

Q

x	y
-1	-5
2	4
3	7
4	10

R

x	y
-2	3
1	3
3	3
5	3

S

x	y
3	4
4	5
3	-4
4	-5

Which table represents a relationship that is not a function?

[1] P

[2] Q

[3] R

[4] S

Question 17

Consider the functions

$$h(x) = 2x^2 + x - 1 \quad \text{and} \quad g(x) = 4x - 5.$$

The value of $h(-1) - g(-1)$ is

[1] -9.

[2] 0.

[3] 9.

[4] 11.

Question 18

The equation of the straight line that is parallel to the straight line

$$2y = 3x - 1$$

is

[1] $2y = x - 3$.

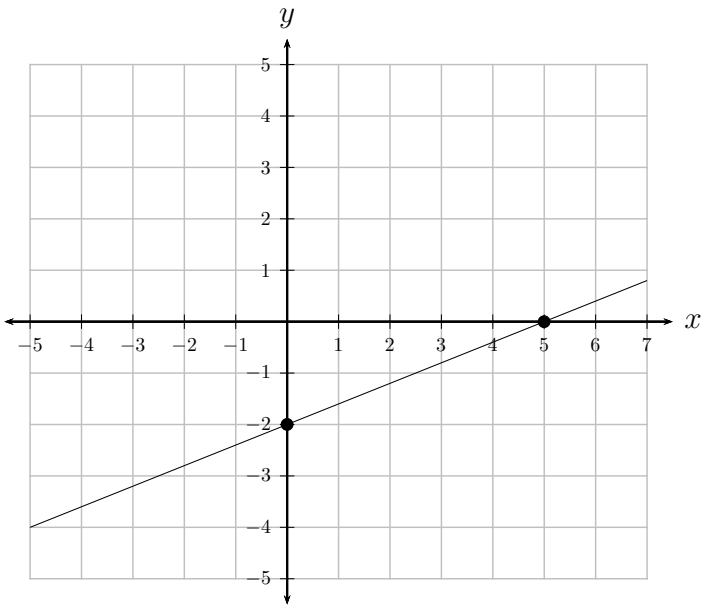
[2] $4y = 6x + 8$.

[3] $3y = 2x - 3$.

[4] $y = \frac{1}{3}x - 1$.

Question 19

Consider the straight line drawn below:



The linear equation that does NOT represent this line is

[1] $2y + 4 = 5x$.

[2] $y - \frac{2}{5}x = -2$.

[3] $5y = 2x - 10$.

[4] $2 + y = \frac{2}{5}x$.

Question 20

The following table represents a linear function $y = f(x) = ax + b$:

x	y
-1	5
1	9
3	13
5	17

The straight line that has a greater slope and a greater y-intercept than the straight line described by the linear function above is

[1] $y = 2x + 8{,}5$.

[2] $y = 3x + 7{,}5$.

[3] $y = 5x + 6{,}5$.

[4] $y = 10x + 5{,}5$.

3 EXAMINATION

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

There will be one examination period for the 2021 academic year. This exam period will be towards the end of the second half of the year. The exact dates will still be made available.

The following are some preliminary arrangements. All information will be communicated to you in time.

- ▷ The examination will take place on the Online Assessment tool located in your module examination site in myExams.
- ▷ No separate examination question paper will be available. The Online Assessment tool will present the questions to you.
- ▷ Expect to be online for the full duration of the examination.
- ▷ The paper consists of only multiple-choice questions and the answers to these questions may only be submitted online.
- ▷ The examination will cover all the study material. It is, therefore, important that you complete as many exercises as possible. Remember, practice makes perfect!

4 OTHER INFORMATION

For all other information regarding QMI1500, you should still refer to Tutorial letter 101. Be assured that we will do our utmost best to communicate information, arrangements, changes to arrangements and everything that you need to know, in good time. You have the obligation to consult your module site for QMI1500 on myUnisa regularly (at least twice a week) to stay in touch and be informed of the latest arrangements.

The content of QMI1500 is interesting and it contains valuable techniques and methods that come in handy in your everyday life. May you have a great experience studying QMI1500!

Kind regards

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