



MASENO UNIVERSITY

UNIVERSITY EXAMINATIONS 2017/2018

FOURTH YEAR FIRST SEMESTER EXAMINATION FOR
THE DEGREE OF BACHELOR OF SCIENCE IN APPLIED
STATISTICS, ACTUARIAL SCIENCE, MATHEMATICAL
SCIENCE AND MATHEMATICS AND ECONOMICS WITH
INFORMATION TECHNOLOGY

MAIN CAMPUS

MIT 403: WRITING MACROS WITH L^AT_EX

Date: 22nd February, 2018

Time: 3.30 - 6.30pm

INSTRUCTIONS:

- Answer Question ONE and any other TWO.



QUESTION 1. COMPULSORY (30 MARKS)

- (a) What do you understand by Debugging as used in the course? [2 marks]
- (b) Errors can be put into different categories. List any two 'common mistakes' that could lead to the following errors and give an example for each.
- (i) Undefined control sequence [3 marks]
- (ii) Missing package [3 marks]
- (c) Write the source code that will produce the table below.

Program	Units Code	
Math Science	MMA	Real Analysis
Actuarial Sci.	MAC	Risk Theory
Applies Stat.	MAS	Probability

Table 1: Simple table

- [6 marks]
- (d) There are two main ways ways of bibliography management. *BibTeX* and the embedded system. It is always a challenge dealing with capital letters in BibTeX. Briefly explain. [2 marks]
- (e) Explain **TWO** reasons why you would prefer creating a document in \LaTeX rather than WYSIWYG? [4 marks]
- (f) Give any **FOUR** 'special' characters in \LaTeX and how they can be written to appear in your document. [4 marks]
- (g) You have an image that you want to use in your latex document. What's the first step you will take to include the image and give a short \LaTeX code including the image ('img.png' for example). Caption: 'My first image'. What package(s) do you require? [6 marks]

QUESTION 2. (20 MARKS)

- (a) (i) Give any two examples of *floats* as used in \LaTeX . [1 mark]
- (ii) In your own words what do you understand by Float barrier and why and where will someone use `\FloatBarrier` and what package do you require to use it? [5 marks]
- (b) Write a \LaTeX code to give the following. What package(s) is (are) required?

$$y = a + f(\overbrace{bx}^{\text{Wrong}}) = a + f(\overbrace{bx}^{\text{Right}})$$

≥ 0 by assumption ≥ 0 by assumption

- (c) Identify and correct the errors in the following extract. [8 marks]
- [6 marks]

```

1 \documentclass[a4paper,12pt]{article}
2
3
4 \begin{document}
5 \chapter{First chapter}
6
7 This is the first chapter of this document.
8 It has several sections.
9 \section{The first section}
10 This section is the first and last.
11 Let's do some math.
12 \begin{align}
13 (a+b)^2&=a^2+2ab+b^2\\
14 (a-b)^2&=a^2-2ab+b^2
15 \end{align}
16 \end{document}

```

QUESTION 3. (20 MARKS)

- (a) Give any two reasons why it is important to create customised commands in \LaTeX ? [2 marks]
- (b) Define a command that typesets its argument as both bold and italic. [3 marks]
- (c) Define commands with the given number of arguments that will work as explained in the table below. [15 marks]

Command name	No. of arguments	Function
comb	2	$\binom{arg1}{arg2}$
mat	5	$\begin{pmatrix} arg1 & arg2 \\ arg3 & \frac{arg4}{arg5} \end{pmatrix}$
seq	4	$arg1_{arg2} + \dots + arg1_{arg3} + arg4^2$
ovrund	4	$\overbrace{arg1 + \dots + arg2}^{arg3} + \underbrace{arg1}_{arg4}$

QUESTION 4. (20 MARKS)

- (a) (i) Give one reason why BibTeX is more preferred to the embedded bibliography. [2 marks]
- (ii) Give any TWO ways in which BibTeX is different from embedded bibliography. [4 marks]
- (b) Briefly explain when, where and why the following are used: [6 marks]
- $\renewcommand{\bibname}{REFERENCES}$
- $\renewcommand{\refname}{REFERENCES}$
- (c) Write \LaTeX codes to show how you would write the following in both BibTeX and embedded system [hint: use article as the document class and apa as the bibliography style] [8 marks]