UNIVERSITY OF JOHANNESBURG

FACULTY OF SCIENCE

DEPARTMENT OF MATHEMATICS AND APPLIED MATHEMATICS

MODULE: **MATHEMATICS FINANCE AND BUSINESS 1A– MATDCA1**

CAMPUS: **APK/SWC**

ASSESSMENT: **Supplementary Examination**

DATE: **15 JULY 2021**

ASSESSORS: **MR A ALOCHUKWU**
DR P GATABAZI
MR T MOHUBEDU

28

INTERNAL MODERATOR: **MS M JUGA**

DURATION: **2 Hours (Both online and written)**

INITIALS AND SURNAME: _____

STUDENT NUMBER: _____

CONTACT NUMBER: _____

NUMBER OF PAGES: 3 (INCLUDING COVER PAGE)

INSTRUCTIONS:

- **ANSWER ALL THE QUESTIONS IN PEN.**
- **ALL GRAPHS MUST BE DRAWN IN PEN.**
- **NO PENCIL OR TIPEX ALLOWED.**
- **SHOW ALL THE NECESSARY CALCULATIONS CLEARLY.**
- **IF FORMULAS ARE USED THEY MUST BE STATED AS MARKS ARE GIVEN TO THEM.**
- **ONLY SCIENTIFIC CALCULATORS ARE ALLOWED.**
- **IF NECESSARY, ROUND OFF TO TWO DECIMAL PLACES.**
- **THE QUESTIONS CAN BE ANSWERED IN ANY ORDER.**

Question 1

Simplify the following expression: [4]

$$\frac{1}{x+1} - \frac{2}{x^2+2x+1} + \frac{3}{x^2-1}$$

Question 2

A line **L_1** passes through the point $(2, 1)$. Another line **L_2** parallel to **L_1** passes through two points $(4, 2)$ and $(2, -6)$. Find an equation of **L_1.** [4]

Question 3

Solve for x: $\sqrt{2x-5} - \sqrt{x-2} = 1$ [5]

Question 4

The profit, P, of a manufacturer, from producing and selling q items is given by $P = -2.5q^2 + 8000q - 45000$.

4.1. Determine the level of production that maximises profit. [2]

4.2. Determine the maximum profit. [1]

Question 5

Perform the following operation by making use of long division **and** write down the final answer: [5]

$$(3x^3 - 10x^2 + 5) \div (3x - 1)$$

Question 6

Solve the following system of equations: [7]

$$\begin{cases} 6x - z = 3 \\ x + 4y + 2z = -\dfrac{5}{2} \\ 2x + y + z = 5 \end{cases}$$

End of Assessment – Total 28 Marks