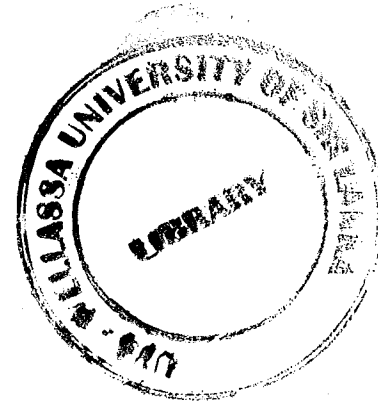


Part C – Essay Questions



Answer only Two (02) questions from Part C

Marks allocation: 50 Marks

01.

a. Find the limits of the followings.

i) $\lim_{x \rightarrow 0} \frac{x^2 + x}{x}$

ii) $\lim_{x \rightarrow 2} \frac{3x^2 - x - 10}{x^2 - 4}$

iii) $\lim_{x \rightarrow 4} \frac{3 - \sqrt{x+5}}{x-4}$

(15 marks)

b. Let $f(x) = \frac{|x|}{x}$, find the $\lim_{x \rightarrow 0} f(x)$

(10 Marks)

02.

a. Determine if the following function is continuous at $x=1$

$$f(x) = \begin{cases} 3x - 5 & \text{for } x \neq 1 \\ -2 & \text{for } x = 1 \end{cases}$$

(10Marks)

b.

i) Find first order derivative of $f(x) = 2x$ at $x=0$

(05Marks)

ii) Find second order derivative of $f(x) = e^x$ at $x=0$

(05Marks)

iii) Find second order derivative of $f(x) = xe^x$ at $x=0$

(05Marks)

03.

a. Solve the following inequalities

i) $|x+2| < 4$

ii) $2x^2 + 4x + 2 < 8$

iii) $3x - 5 > -2$

(15Marks)

b. Integrate

i.) $\int 2 - 3e^x dx$

ii.) $\int_0^1 x^3 + 3x + 1 dx$

(10Marks)