INTI International University & Colleges

FINAL
ALTERNATIVE ASSESSMENT

(COVER PAGE)

Session	:	**April 2022**
Programme	:	Certificate in Information Technology (CIT)
Course	:	**MAT1000 : Basic Mathematics**
Date of Examination	:	August 3, 2022 (Wednesday)
Time	:	12.00pm – 2.30 pm Reading Time : Nil
Duration	:	2 Hours 30 Minutes

Special Instructions :

This paper consists of **FOUR (4)** questions. Answer **ALL** questions. All questions carry equal marks.

NOTE : 30 minutes is added into the duration of the examination to factor in any connectivity matters and for you to scan and upload your scripts.

Material permitted :
Non-Programmable Scientific Calculator

Materials provided :
Nil

Examiner(s)	:	**Mr Mohd Hafis Zakaria** and Teng Mei Tuan
Chief Moderator	:	Ms S.M.Elizabethrani Allappan

*This paper consists of **5** printed pages, including the cover page*

CERTIFICATE IN INFORMATION TECHNOLOGY PORGRAMME (CIT)
MAT1000: BASIC MATHEMATICS
FINAL ALTERNATIVE ASSESSMENT: APRIL 2022 SESSION

Instructions: This paper consists of **FOUR (4)** questions. Answer **ALL** questions. All questions carry equal marks.

Question 1

(a) It is given that $A = \left\{-7, 0, \frac{10}{2}, 6, 2.51, \sqrt{64}, \pi, \frac{19}{3}\right\}$. List down the elements of A that belong to the following sets:

(i) Whole number(s) (1 mark)

(ii) Natural number(s) (1 mark)

(iii) Rational numbers(s) (1 mark)

(iv) Integers(s) (1 mark)

(v) Irrational number(s) (1 mark)

(vi) Real number(s) (1 mark)

(vii) Even number(s) (1 mark)

(b) Find the simplification of the following expressions and leave your answers in **positive exponents** where applicable.

(i) $(x^5y)(xy)^2$ (2 marks)

(ii) $\frac{6xy^3}{24x^2y}$ (3 marks)

(c) Find the simplification of the following expressions by rationalizing the denominator.

(i) $\frac{8}{\sqrt{2}}$ (2 marks)

(ii) $\frac{2}{\sqrt{3}-1}$ (3 marks)

(d) A line passes through the points $(4, 2)$ and $(1, 3)$. Find the

(i) distance between two points (2 marks)

(ii) midpoint between two points (2 marks)

(iii) slope of that line (2 marks)

(iv) equation of the line (2 marks)

Question 2

(a) Find the simplification of the following expressions.

(i) $(4)^{\frac{1}{2}} \times (16)^{\frac{3}{2}}$ (2 marks)

(ii) $(x + 2)(3x + 1)$ (2 marks)

(b) Find the slope, *x*-intercept and *y*-intercept of the line determined by equation $x = \frac{1}{3}y + 2$. Then sketch the function clearly. (7 marks)

(c) Let $f(x) = x^2 + 1$ and $g(x) = x - 2$. Find

(i) $(f + g)(3)$ (2 marks)

(ii) $(f \cdot g)(3)$ (2 marks)

(iii) $(f \circ g)(x)$ (3 marks)

(d) Let $y = x^2 + 2x - 8$.

(i) Find the vertex point, x-intercepts and y-intercept. (5 marks)

(ii) Sketch the function clearly showing the above points. (2 marks)

Question 3

(a) Solve the following inequalities:

(i) $-2 < 4 - 2x \leq 12$ (3 marks)

(ii) $2|x - 3| - 6 \geq 8$ (4 marks)

(b) Sketch the graphical solution of the following system of inequalities.

$$x + y \leq 2$$
$$x - y \leq 1$$
$$x > -2$$

(7 marks)

(c) Solve the following simultaneous equations.

$$-x - 2y = 7$$
$$2x + 3y = 12$$

(3 marks)

(d) Change the logarithmic expression $\frac{1}{2}\log_b(x+1)^2 + \log_b y^2 - 3\log_b z$ as a single logarithm. (4 marks)

(e) Apply the properties of logarithms to expand $\log_2\left(\frac{8\sqrt{x}}{y^2}\right)$. (4 marks)

Question 4

(a) Solve the following exponential equations. Give answer in 4 significant figure where applicable.

(i) $e^{1+x} = 8$ (3 marks)

(ii) $3^x = 7$ (3 marks)

(b) The width of a rectangle is 3cm shorter than the length. Find the dimension of the rectangle if its area is 10cm^2. (5 marks)

(c) Given the first 5 terms of an arithmetic sequence, $-15, x, y, z, 9$. Find the

(i) values of x, y and z, (5 marks)

(ii) sum of the first 7 terms. (2 marks)

(d) The nth term of a geometric sequence is given by $\frac{2(3^n)}{7}$. Find the

(i) first term, (2 marks)

(ii) common ratio, (3 marks)

(iii) sum of the first 7 terms. (2 marks)

~THE END~