BIT No:

SLIIT Computing (Pvt) Ltd.

Bachelor of Information Technology

Final Examination
Year 1, Semester 1, 2006
Friday, 19th May 2006

Foundations of Mathematical Skills (N108)

Duration: 3 Hours
(Time **9.00 a.m. – 12.00 noon.**)

Instructions to Candidates

- This paper contains **FIVE (5)** questions on **TWO (2)** Pages.
- Answer **ALL** questions in the **WORKBOOK** provided.
- The entire exam is worth 100 points. The point value of each question is given.

Question 1 (20 marks)

Simplify the following

i.) $(4x^{-2}y)^2(3x^3y^{-4})$

ii.) $\left(\frac{3r^6s}{4r^2s^3}\right)^2$

iii.) $\left(\frac{6x^{-2}y^5}{3x^4y^{-3}}\right)^2$

Question 2 (20 marks)

i.) $\log_a 45 + 4\log_a 2 - \frac{1}{2}\log_a 81 - \log_a 10 = \frac{3}{2}$ Find the value for **a**

ii.) $\frac{\log 27 + \log 8 - \log 125}{\log 1.2}$ Find the value of the expression

iii.) Show that $\frac{1}{\log_a(ab)} + \frac{1}{\log_b ab} = 1$

Question 3 (20 marks)

i.) Find the slope of the graph y= (x-3)(x+4) when x= -1.

Find the $\frac{dy}{dx}$ for the following equations

ii.) $y = 2x + 3$

iii.) $y = \frac{1}{ax+b}$ **a** and **b** are constants

iv.) $y = \left(x^2 + a^2\right)^{10}$ **a** is a constant

Question 4 (20 marks)

i.) Find $\frac{dy}{dx}$, $y = x^3 + x^2 + 1$

ii.) Find $\frac{dy}{dx}$, $y = \left(\frac{(x^2+1)(x-1)^2}{(2x-1)} \right)$

iii.) Find $\frac{dy}{dx}$, $y = \sqrt{5x^2 + 3}$

iv.) If $y^2 - 2xy = 2x$ then show that $(x-y)\frac{d^2y}{dx^2} + 2\frac{dy}{dx} = \left(\frac{dy}{dx}\right)^2$

Question 5 (20 marks)

i.) Write the equation of the line, which has the gradient or the slope (m) as $\frac{3}{2}$ that passes the point (1, 2)

ii.) Write the equation of the line that passes through (-2, 4) and parallel to $y - 3x = 2$

iv.) Write the equation of the line that passes through (3, 2) and perpendicular to $x + 2y = 3$

v.) Draw the graphs for the following equations

a. $y = x + 5$

b. $y = x^2 - 4x - 12$

----------End of paper----------