



Sri Lanka Institute of Information Technology

Bachelor of Science in Information Technology

Mid Term Examination

Year 1, Semester 1, 2012

Tuesday, 10th April 2012

Mathematics for Information Technology (N109)

Duration: 1 Hour

(Time 09.00 a.m. – 10.00 a.m.)

Instructions to Candidates

- This paper contains **SEVEN (7)** Questions on **ONE (1)** Page.
- Answer **ALL** questions **on the WORKBOOK** provided.
- The paper is worth 30 marks.

1. Specify the domain of the function $y = \frac{x+1}{x^2-x-2}$ [2 marks]

2. Find the rate of change of the function $y = x(1-x)$ with respect to $x = -1$. [3 marks]

3. Determine where the given function $f(x) = x^3 - 6x^2 - 12x + 2$ is increasing and decreasing. Find the relative extrema and inflection points if any and sketch the graph of the function. [8 marks]

4. Differentiate the given functions. [5 marks]

a. $f(x) = \frac{e^x}{e^x + e^{-x}}$

b. $f(x) = \ln\left(\frac{x^5}{(1-10x)\sqrt{x^2+2}}\right)$

5. The function $s(t) = -4t^2 + 16t + 2$ gives the height in meters of an object after throwing vertically upward from a point. How high above the ground (maximum height) will the object reach? [4 marks]

6. Find the indefinite integral of $\int \left(3\sqrt{x} - \frac{2}{x^3} + \frac{1}{x}\right) dx$ [3 marks]

7. Find definite integral of $\int_{-1}^2 (x-1)(x^2+1) dx$ [5 marks]

*** End of Paper ***