Sri Lanka Institute of Information Technology

B.Sc. Degree
in
Information Technology

Mid Examination
Year 1, Semester 1 (2015)
June Intake

Mathematics for Information Technology (N109)

Duration: 1 Hour

Instructions to Candidates:

- This is a closed book examination.
- This paper contains 5 questions on 1 page without the cover page.
- Answer all questions in the WORKBOOK provided.
- Read all questions before answering.
- The total marks obtainable for this examination is 30.

1) Specify the domain of the given functions.

i) $f(x) = \frac{1}{\sqrt{x-3}}$

ii) $f(x) = \frac{x}{x^2-10x-24}$ (2 x 2 marks)

2) Solve the given equations for x.

i) $log_b(x^2) = log_2(2x-1)$

ii) $log_2(x) + log_2(x-2) = 3$

iii) $7 + 15e^{3x-1} = 10$ (3 x 2 marks)

3) Differentiate the following functions.

i) $y = \frac{2x^2-1}{x+1}$

ii) $y = e^{2x}\ln(2x)$ (2 x 2.5 marks)

4) Use calculus to sketch the graph of $f(x) = x^4 - 4x^3$. Find the **relative extrema** and **inflection points** if any. (9 marks)

5) Find the anti-derivatives of the given indefinite integrals.

i) $\int \left(3x^2 + \sqrt{x} - \frac{5}{x^3}\right) dx$

ii) $\int \left(\frac{(2x^2-1)(x+1)}{x}\right) dx$ (2 x 3 marks)

End of the Question Paper.