Sri Lanka Institute of Information Technology

B.Sc. Degree
in
Information Technology

Mid Examination
Year 1, Semester 1 (2016)
January 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) $f(x) = \frac{12}{\sqrt{10x+1}}$

ii) $f(x) = \sqrt{|x| - 7}$

(2 x 2 marks)

2) Solve the given equations for x.

i) $log_{10} x + log_{10} 3 = 2log_{10} 4 - log_{10} 2$

ii) $log_4 x + log_4(x - 1) = \frac{1}{2}$

iii) $5(8e^{2x} - 3)^3 - 625 = 0$

(3 x 2 marks)

3) Differentiate the following functions.

i) $y = (x + 1)(x + 3)^2$

ii) $y = \frac{5e^x}{3e^x+1}$

iii) $y = \ln(1 - 2x)^3$

(3 x 2 marks)

4) Use calculus to sketch the graph of $f(x) = x^3 - 9x$. Find the **relative extrema** and **inflection points** if any. (8 marks)

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

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

ii) $\int (2x + 3)^2 dx$

(2 x 3 marks)

End of the Question Paper.