Sri Lanka Institute of Information Technology

B.Sc. Degree
in
Information Technology

Mid Examination
Year 1, Semester 1 (2016)
June Intake

Mathematics for Information Technology (N109)

Duration: 1 Hour

Instructions to Candidates:

- This is a closed book examination.
- This paper contains 4 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 following functions.

i) $f(x) = \frac{\sqrt{x-7}}{x+10}$

ii) $f(x) = \frac{\sqrt{x-7}}{(x+1)(x-2)}$

iii) $f(x) = \frac{15}{\sqrt{|x|-1}}$

(3 x 2 marks)

2) Solve the following equations for x.

i) $log_{10} x + log_{10} (x - 1) = log_{10} (3x + 12)$

ii) $log_2(x^2 - 6x) = 3 + log_2(1 - x)$

iii) $5ln(3 - x) = 4$

(3 x 2 marks)

3) Differentiate the following functions.

i) $y = (x^2 + 2x)(x - 2)^2$

ii) $y = \frac{2x^2+10x+1}{-3x^2}$

iii) $y = \ln(\frac{2x-1}{\sqrt{x+1}})^3$

iv) $y = (e^{2x-5})x^2$

(4 x 2 marks)

4) Use calculus to sketch the graph of $f(x) = -2x^3 - 9x^2 + 24$. Find the **relative extrema** and **inflection points** if any. (10 marks)

End of the Question Paper.