Sri Lanka Institute of Information Technology

B.Sc. Degree
in
Information Technology

Mid Examination
Year 1, Semester 1 (2017)
January 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 given functions. (3 x 2 marks)

i) $f(x) = \frac{20x}{\sqrt{x^2-1}}$

ii) $f(x) = \sqrt[3]{x-5}$

iii) $f(x) = \frac{\sqrt{4-x}}{x^2-2x-15}$

2) Solve the given equations for x. (4 x 2 marks)

i) $3^x - 3^{(2x+5)} = 0$

ii) $4^{5-9x} = \frac{1}{8^{(x-2)}}$

iii) $2log_{10}(\sqrt{x}) - log_{10}(6x-1) = 0$

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

3) Differentiate the following functions. (3 x 2 marks)

i) $y = \sqrt{x^2-2x}.(5x+100)$

ii) $y = 3e^x + 10x^3\ln(x)$

iii) $y = \ln(\frac{5x+6}{x^2-1})$

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

End of the Question Paper.