Sri Lanka Institute of Information Technology

B.Sc. Degree
in
Information Technology

Mid Examination
Year 1, Semester 1 (2018)
January Intake

Mathematics for Information Technology (IT1105)

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. (2 x 2.5 marks)

i) $f(x) = \sqrt{4 + |x|}$

ii) $f(x) = \frac{\sqrt{16-4x}}{(x-5)(x-8)}$

2) Solve the given equations for x. (5 x 2 marks)

i) $4^{(2x-5)} = 64$

ii) $5^{2x-3} = 15$

iii) $e^{4x-8} = 20$

iv) $log_2\left((x+1)x\right) = 1$

v) $2log_{10} 3 + \frac{1}{2} log_{10} 16 - log_{10} 3 = log_{10} x$

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

i) $y = ln\left(\frac{2x^2+4}{\sqrt{4x}}\right)^2$

ii) $y = e^{\sqrt{4x+10}}$

4) Integrate the following functions. (2 x 2 marks)

i) $y = \int (3x^2 - \sqrt{5x} + 2)\, dx$

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

5) Use calculus to sketch the graph of $f(x) = x^4 - 6x^2$. Find the **relative extrema** and **inflection points** if any. (7 marks)

End of the Question Paper.