Sri Lanka Institute of Information Technology

B.Sc. Degree
in
Information Technology

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

Mathematics for Information Technology (IT1105)

Duration: 1 Hour

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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.

a) Specify the domain of the given functions. (2 x 2.5 marks)

i) $f(x) = \frac{1}{\sqrt{4+x}}$

ii) $f(x) = \frac{\sqrt[3]{x-6}}{(x^2-4x-5)}$

b) Solve the given equations for x. (5 x 2.5 marks)

i) $\ln(2x-5) = \ln(11)$

ii) $5 + e^{(x+1)} = 20$

iii) $4^{(x-3)} = \frac{1}{16}$

iv) $2log_4(x) - log_4(x-1) = 1$

v) $4\ln(2x+3) = 11$

c) Differentiate the following functions. (2 x 2.5 marks)

i) $y = ln\sqrt{\frac{x^2-2x}{5x}}$

ii) $y = 5xe^{\sqrt{4x^2}} + 5$

d) Use calculus to sketch the graph of $f(x) = \frac{x^4}{4} - x^2 + 1$. (7.5 marks)
Find the **relative extrema** and **inflection points** if any.

End of the Question Paper.