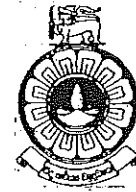THE OPEN UNIVERSITY OF SRI LANKA

B.Sc/B.Ed DEGREE PROGRAMME - LEVEL 05

OPEN BOOK TEST-2023/2024

ADU5307 — NUMERICAL METHODS

DURATION: ONE HOUR

Date: 16. 07. 2023	Time: 2.30 p.m. –3.30 p.m.

ANSWER ALL QUESTIONS.

1. Find the root of the equation $f(x) = x^3 - x - 1$ using the Newton-Raphson method, correct to four decimal places considering the initial approximation as $x_0 = 0$.

2. Using Horner's scheme show that the roots of the polynomial $f(x) = x^4 - 15x^2 - 10x + 24$ are 1 , -2 , -3 and 4.

3. Applying Newton's divided difference formula, find the value of $f(1.2)$ using the fourth-order polynomial of $f(x)$.

x	0	2	5	7	11
f(x)	2.153	3.875	4.279	4.891	5.256

4. Find the third-order polynomial to the following data points by applying Lagrange's interpolation formula. **Hence** determine the value of $f(2)$.

x	0	1	3	4
f(x)	-12	0	6	12