

The
Management
University
of Africa



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UNDERGRADUATE UNIVERSITY EXAMINATIONS

SCHOOL OF EDUCATION (SOE)

DEGREE OF BACHELOR OF EDUCATION ARTS

MTH 443: NUMERICAL ANALYSIS

DATE: 29TH JULY 2026

DURATION: 2 HOURS

MAXIMUM MARKS: 70

INSTRUCTIONS:

1. Write your registration number on the answer booklet.
2. **DO NOT** write on this question paper.
3. This paper contains **SIX (6)** questions.
4. Question **ONE** is compulsory.
5. Answer any other **THREE** questions.
6. Question **ONE** carries **25 MARKS** and the rest carry **15 MARKS** each.

**Write all your answers in the Examination answer booklet
provided**

QUESTION ONE

a) Compute the percentage error in approximating the sum: $3.45 + 4.87$

(6 marks)

b) Convert the polynomial $P(x) = 5x^4 - 3x^3 + 2x^2 - x + 6$ into nested form and evaluate $P(3)$

(6 marks)

c) Construct the forward difference table for $f(x) = x^3 - 2x^2 + x + 1$

for $x = 0, 1, 2, 3, 4$.

(6

marks)

d) The displacement of an object is recorded in the table below

Time (t)	0	1	2
Displacement(s)	1	6	15
)			

Find the quadratic equation describing the motion

(7

marks)

QUESTION TWO

a) Rectangular land measures 7.322 by 3.431 metres. Find the relative error in the area.

(6 marks)

b) Use synthetic division to divide $4x^3 + 2x^2 - 5x + 6$ by $2x - 3$

(4 marks)

c) Find a cubic collocation polynomial for $y'' = x$

(5

marks)

QUESTION THREE

a) Use the data in the table to compute the finite difference

X	1	2	3	4	5	6	7	8
f(x)	2	9	22	41	66	97	134	177

(5

marks)

b) Find and correct a misprint in the list below

1 2 4 8 16 26 42 64 93

(10marks)

QUESTION FOUR

a) Use Newton Forward interpolation formula to estimate the value of f

(2.5) given the table below

X	1	2	3	4
f(x)	1	8	27	64

8

(7

marks)

- b) Find the quadratic polynomial passing through the points (1, 2), (2, 3), (4, 11). Then estimate the value of y when $x = 3$

(8 marks)

QUESTION FIVE

- a) Using the trapezoidal rule to evaluate the value of $\int_0^1 \frac{1}{1+x^2} dx$ with $n = 4$

(8 marks)

- b) Approximate the value of $\int_{-3}^3 x^4 dx$ by taking seven equidistance intervals by Simpson's rule

(7marks)

QUESTION SIX

- a) Find the root of $x^3 - 2x - 5 = 0$ using Regula Falsi method correct 3 decimal places

(8 marks)

- b) Find the root of the equation $x^3 - x - 1 = 0$ using Newton Raphson

(7 marks)

STION

