

SCHOOL OF APPLIED SCIENCE & HUMANITIES

DEPARTMENT OF MATHEMATICS

Subject: Foundations of Engineering Mathematics

Subject Code: 25MT101

Sem. : Pre-Semester

Academic Year: 2025-2026

Section: 26

Regulation: R25

Assignment 2

20 Marks

1. How many onto functions are possible from a set A with 4 elements to a set B with 3 elements?

2. If $f: \mathbb{N} \rightarrow \mathbb{N}$ is given by $f(n) = n + 5$ and $g: \mathbb{N} \rightarrow \mathbb{N}$ is given by $g(n) = 2n$, find:
 - a. $(g \circ f)(n)$
 - b. $(f \circ g)(n)$
 - c. Are $g \circ f$ and $f \circ g$ equal?

3. Let $f: \mathbb{R} - \{-2\} \rightarrow \mathbb{R} - \{3\}$ be defined as: $f(x) = \frac{3x+5}{x+2}$.
 - a. Prove that f is bijective.
 - b. Find $f^{-1}(x)$.

4. Let $f: \mathbb{R} \rightarrow \mathbb{R}$ be defined by $f(x) = x^2 - 4x + 3$. Determine whether f is one-one, onto, or bijective. Justify your answer.

5. Let $A = \{1, 2, 3\}$. How many onto functions can be defined from A to $\{a, b\}$?