GU TECH, Al Ghazali University

SUBJECT: CS103 – DISCRETE STRUCUTRES

QUIZ#02 (FALL 2024)

SOLUTION PAPER - A

Date: 09-01-2025 *Max Marks: 02* *Duration: 15 minutes*

Note: Attempt question on question paper. All questions carry equal marks.

Roll#:_____ Student Signature:_____

Q1): Why is *f* not a function from **R** to **R** if

$f(x) = \sqrt{x}$?

Sol:

The square root of a negative number (x<0) is not defined in R, as it would result in a complex number (in **C**). e.g. $f(-1)=\sqrt{-1}$ is not a real number; it is *i*, an imaginary number.

Q2): Determine the functions from {a, b, c, d} to itself is one-to-one.

f (a) = b, f (b) = a, f (c) = c, f (d) = d

Sol:

yes

Q3): Give an explicit formula for a function from the set of integers to the set of positive integers that is

onto, but not one-to-one.

Sol.

Function: f(n)=|n|

- Domain: Z={−2,−1,0,1,2}
- Codomain: Z^{+}={0,1,2}

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QUIZ#02 (FALL 2024)

SOLUTION PAPER - B

Date: 9-01-2025 *Max Marks: 02* *Duration: 15 minutes*

Note: Attempt question on question paper. All questions carry equal marks.

Roll#:_____ Student Signature:_____

Q1): Why is *f* not a function from **R** to **R** if

$f(x) = 1/x$

Sol:

Why $f(x) = \frac{1}{x}$ is not defined for $x = 0$:

1. **Division by Zero:**
   - Division by zero is undefined in mathematics.
   - For $f(x) = \frac{1}{x}$, the value of $f(0)$ does not exist because $\frac{1}{0}$ is undefined.

Q2): Determine the functions from {a, b, c, d} to itself is one-to-one.

f (*a*) = *b*, *f* (*b*) = *b*, *f* (*c*) = *d*, *f* (*d*) = *c*

Sol:

No

Q3): Give an explicit formula for a function from the set of integers to the set of positive integers that is

one-to-one and onto.

Sol.

Function: f(n)=n+3

Domain: Z={1,2,3,4,5}

Codomain: Z^+={4,5,6,7,8}

GU TECH, Al Ghazali University

SUBJECT: CS103 – DISCRETE STRUCUTRES

QUIZ#2 (FALL 2024)

SOLUTION PAPER - C

Date: 09-01-2025 *Max Marks: 02* *Duration: 15 minutes*

Note: Attempt question on question paper. All questions carry equal marks.

Roll#:_____ Student Signature:_____

Q1): Why is *f* not a function from **R** to **R** if

$f(x) = \pm\sqrt{(x^2 + 1)}$?

Sol:

The expression $\pm\sqrt{x^2 + 1}$ gives **two possible values** (one positive and one negative) for every $x \in \mathbb{R}$.

For example, if $x = 0$:

$$f(0) = \pm\sqrt{0^2 + 1} = \pm\sqrt{1} = \pm 1$$

Q2): Determine the functions from {a, b, c, d} to itself is one-to-one.

f (a) = d, f (b) = b, f (c) = c, f (d) = d

Sol:

Yes

Q3): Give an explicit formula for a function from the set of integers to the set of positive integers that is

neither one-to-one nor onto.

Sol.

Function: f(n)=1

- *Domain: Z={−2,−1,0,1,2}*
- *Codomain: Z^+={1,2,3}*