Page No.			
Date			

* **Def^n (3)**: A mapping $f: S \to T$ is called onto, if for each $t \in T$ $\exists$ some $s \in S$ such that $f(s) = t$.

* **Def^n (4)**: Two mapping $f: S \to T$ and $g: S \to T$ are said to be equal if,

$$f(x) = g(x) \quad \forall\, x \in S.$$

* **Def^n (5)** The product or Composite of two mappings $f: S \to T$ and $g: T \to U$. is defined as the mapping $g \circ f: S \to U$ such that $(g \circ f)(x) = g(f(x)) \ \forall\, x \in S$.

__Illustrations:-__

1. $f: N \to N$ defined as $f(x) = x^2 \ \forall x \in N$ is one-to-one, ~~since~~ since, for any $x, y \in N$.

$$x \neq y \Rightarrow x^2 \neq y^2 \Rightarrow f(x) \neq f(y).$$

However, ~~f is not onto~~, since, for $2 \in N$ $\nexists$ any $x \in N$ such that $f(x) = 2$.

$[\because f(x) = x^2 = 2 \Rightarrow x = \pm\sqrt{2} \notin N]$.

(2.) $f: I \to I$ defined as $f(x) = x + 3 \ \forall x \in I$ is 1-1 and onto;

Let $x, y \in I$. then $f(x) = f(y)$

$$\Rightarrow x + 3 = y + 3$$

$$\Rightarrow x = y$$

i.e, $f(x) = f(y) \Rightarrow x = y$. & so f is 1-1

Now, let $x \in I$ be arb. then

~~then~~ (T.S) $\exists$ $y \in I$ s.t. $f(y) = x$.