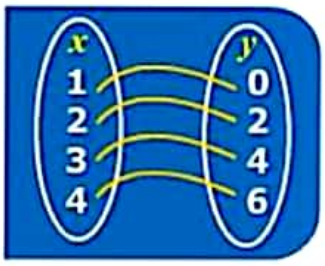
FUNCTIONS

Part I

A funtion is a relationship where each input has a single output.

It is written as "$f(x)$", where 'x' is the input

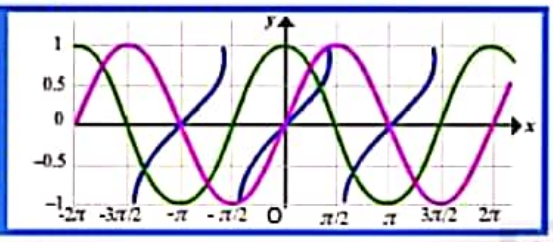


1 Trigonometric Function

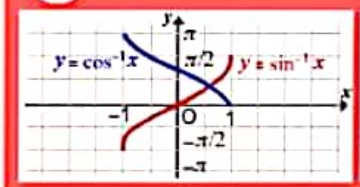
$\sin x$

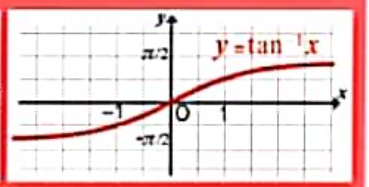
$\cos x$

$\tan x$



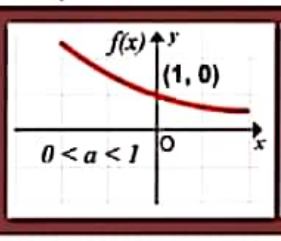
2 Inverse Trigonometric Function

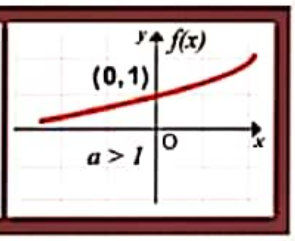




3 Exponential Function

$f(x) = a^x$, where $a > 0$, $a \neq 1$





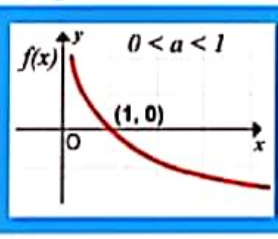
4 Logarithmic Function

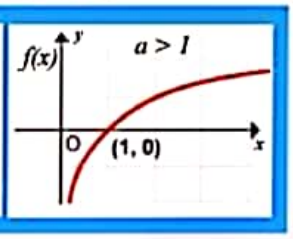
$\log_a x$

$x > 0$

$a > 0$

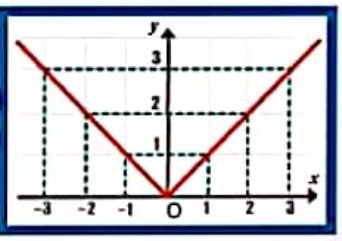
$a \neq 1$





5 Absolute Value Function

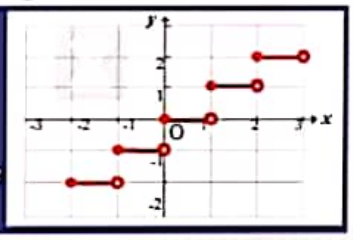
$$y = |x| = \begin{cases} x\ ;\ x \geq 0 \\ -x\ ;\ x < 0 \end{cases}$$



6 Greatest Integer Function

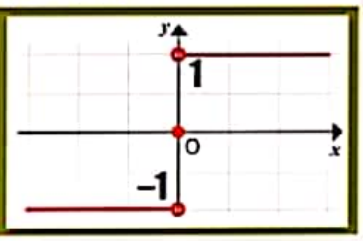
$y = f(x) = [x]$

$$[x] = \begin{cases} x\ ;\ x \in I \\ \text{Greatest Integer}\ ;\ \text{otherwise} \\ \text{less than } x \end{cases}$$



7 Signum Function

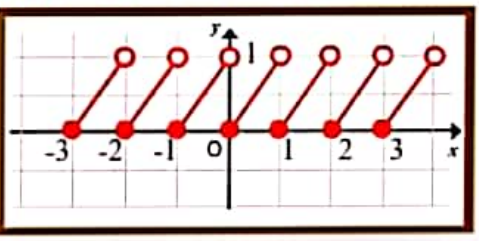
$$y = x = \begin{cases} 1\ ;\ x > 0 \\ 0\ ;\ x = 0 \\ -1\ ;\ x < 0 \end{cases}$$



8 Fractional Part Function

$y = f(x) = \{x\}$

$= x - [x]$



9 Algebraic Function

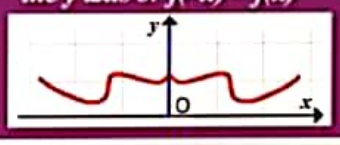
Constructed using $+, -, \times, \div$ & $\sqrt{}$

Ex. $f(x) = \sqrt{(x^4 + 5x^2)}$

10 Even - Odd Function

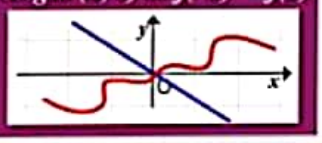
EVEN

symmetrical about the y axis or $f(-x) = f(x)$



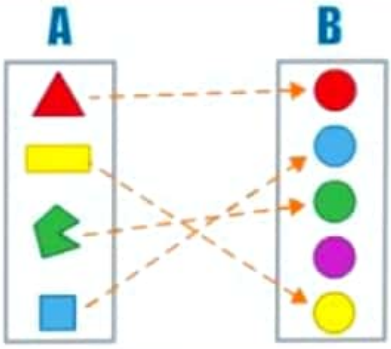
ODD

symmetrical about the origin (0, 0) or $f(-x) = -f(x)$



Part II

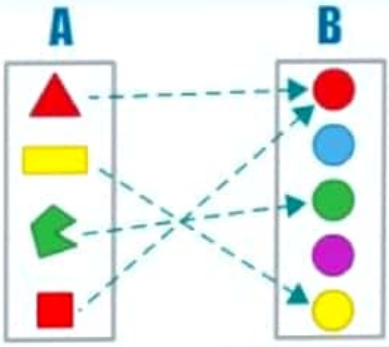
CLASSIFICATION OF FUNCTION



1

One-One Function

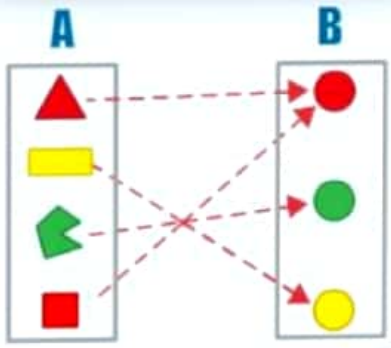
Each element of set A is connected with a different element of set B. It is also called Injective function.



2

Many-One Function

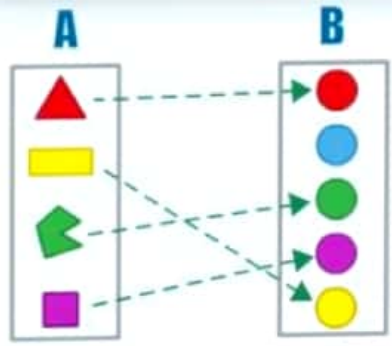
If any two or more elements of set A are connected with a single element of set B.



3

Onto Function

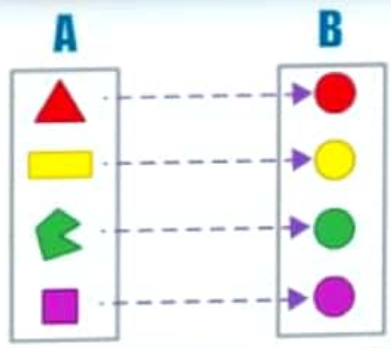
Function f from set A to set B is onto function if each element of set B is connected with elements of set A. It is also called Surjective function.



4

Into Function

Function f from set A to set B is into function if set B has at least one element which is not connected with any of the element of set A.



5

Bijective Function

Function 'f' from set A to set B is Bijective Function if

(a) 'f' is One one function

(b) 'f' is Onto function.