TFCS

KAVISHK BHAT - 20103233 - B8

Tut:- 4

1. (A). Yes

(B). Yes

(C). No, there is no least upper bound.

2. (A). $1+2+3+\dots+99 = \frac{99(99+1)}{2} = 4950$

(B). $100 \times 99 = 9900$

3. (A).
$$\begin{bmatrix} 1 & 1 & 1 & 1 \\ 1 & 1 & 1 & 1 \\ 1 & 1 & 1 & 1 \\ 1 & 1 & 1 & 1 \end{bmatrix}$$

(B).
$$\begin{bmatrix} 0 & 0 & 0 & 0 \\ 1 & 0 & 1 & 1 \\ 1 & 0 & 1 & 1 \\ 1 & 0 & 1 & 1 \end{bmatrix}$$

(C).
$$\begin{bmatrix} 0 & 1 & 1 & 1 \\ 0 & 0 & 1 & 1 \\ 0 & 0 & 0 & 1 \\ 0 & 0 & 0 & 0 \end{bmatrix}$$

(D).
$$\begin{bmatrix} 1 & 1 & 1 & 1 \\ 1 & 1 & 1 & 1 \\ 1 & 1 & 1 & 1 \\ 1 & 1 & 1 & 1 \end{bmatrix}$$

4. (A). $f(0)$ is not defined.

(B). $f(x)$ is not defined for $x < 0$

(C). $f(x)$ is not well defined because there are two distinct values assigned to each x.

5. (A). Yes (B). No (C). Yes (D). No

(6). (A). Let $x \neq y$ be distinct elements of A. Because g is one to one, $g(x) \neq g(y)$ are distinct elements of B. Because f is one-to-one, hence fog is also one to one.

(B). Let $y \in C$. because f is one to, $y = f(b)$. Now because g is one to $b = g(x)$ for some $x \in A$. Hence fog is onto.

7. (A). No. of functions $= 3^2 = 9$

(B). One-One

(C). No one is onto function.

8. (A). $f(g(x)) = x^2 + 2x + 5$

(B). $g(f(x)) = x^2 + 2$

(C). $(f+g)x = x^2 + x + 3$

(D). $f \cdot g(x) = x^3 + 2x^2 + x + 2$