DAA Assignment # 1

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Q1) $7n - 2 = 0(n)$

Solution:-

$f(n) \leq g(n) \forall\ n \geq k$

$f(n) = 7n - 2$

$g(n) = n$

$c = 7$

$7n = 2 \leq 7n$

N = 1

$7(1) - 2 \leq 7(1)$

$5 \leq 7 \ \forall\ n \geq 1$

N = 2

$7(2) - 2 \leq 7(2)$

$12 \leq 14 \ \forall\ n > 1$

Q2) $3n^3 + 20n^2 + 5 = 0(n^6)$

Solutions :-

$f(n) = 3n^3 + 20n^2 + 5$

$g(n) = n^6$

$f(n) \leq g(n) \ \forall\ n \geq k$

$3n^3 + 20n^2 + 5 \leq n^6 \ \forall\ n > k$

N=1

$3(1)^3 + 20(1) + 5 \ \leq 28(1) \forall\ n > 1$

$28 \leq 28 \quad \forall\ n \geq 1$

N = 2

$3(2)^3 + 20\ (2)^2 + 5 \ \leq 28(2)^6$

$109 \leq 1792 \ \forall\ n \ \geq 1$

$Q)\ 7n-2=\emptyset(n^2)$

Solution:-

$C_1\ g(n)\ \leq f(n) \leq C_2\ g(n)$

$F(n)=7n-2$

$g(n)=\ n^2$

$C_1=5$
$C_2=7$

N = 1

$$5n^2\ \leq 7n-2 \leq 7n^2$$

$$5(1)^2 \leq 7(1)-2 \leq 7(1)^6$$

$$5 \leq 5 \leq 7$$

N = 2

$5(2)^2 \leq 7(2)-2 \leq 7(2)^2$

$20 \leq 12 \leq 28$

Hence it is false .

F(n) = n,g(n) = n_2

Transpose symmetric property and it satisfy 0 & Ω notation .

Q (3) $7(n)-2=\emptyset(n)$

Solution:-

$C_1\ g(n) \leq f(n) \leq C_2\ g(n)\ \forall\ n \geq k$

$f(n)=7n-2$

$g(n)=n$

$C_1=5$

$C_2=7$

$5n \leq 7n-2 \leq 7n\ \forall\ n \leq k$

N=1

$5(1)\ \leq 7(1)-2\ \leq 7(1) \forall\ n \geq 1$

$5 \leq 5 \leq 7\ \forall\ n=1$

N = 2

$$\mathbf{5(2) \leq 7(2) - 2 \leq 7(2)} \; \forall \; \boldsymbol{n \geq 1}$$

$$\mathbf{10 \leq 12 \leq 14} \; \forall \; \boldsymbol{n} \; \geq \mathbf{1}$$