

**CS-201**  
Computational Physics

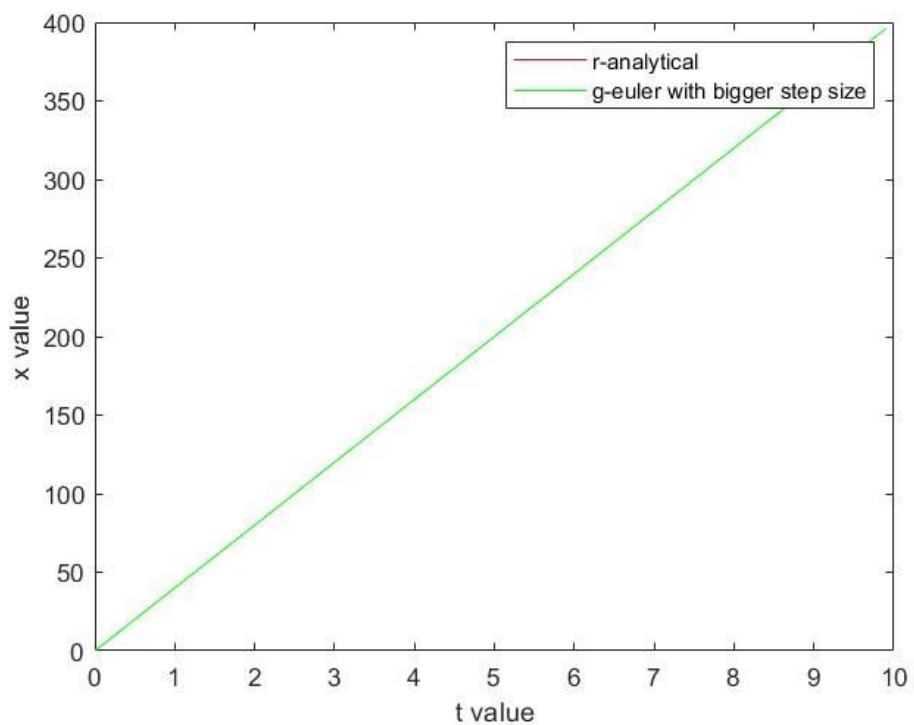
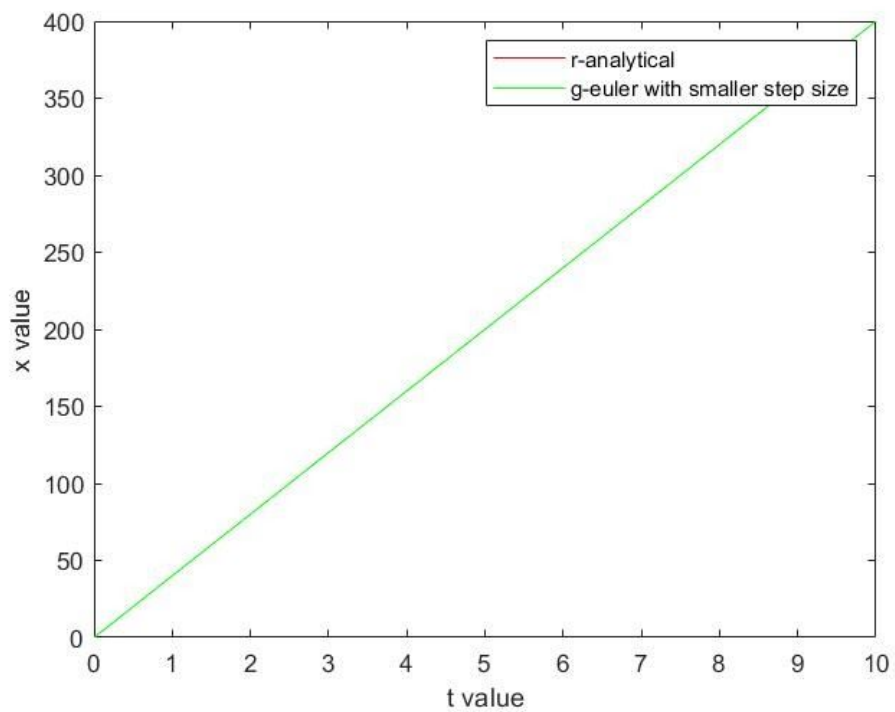
**Lab-2**  
14 . 02 . 2020

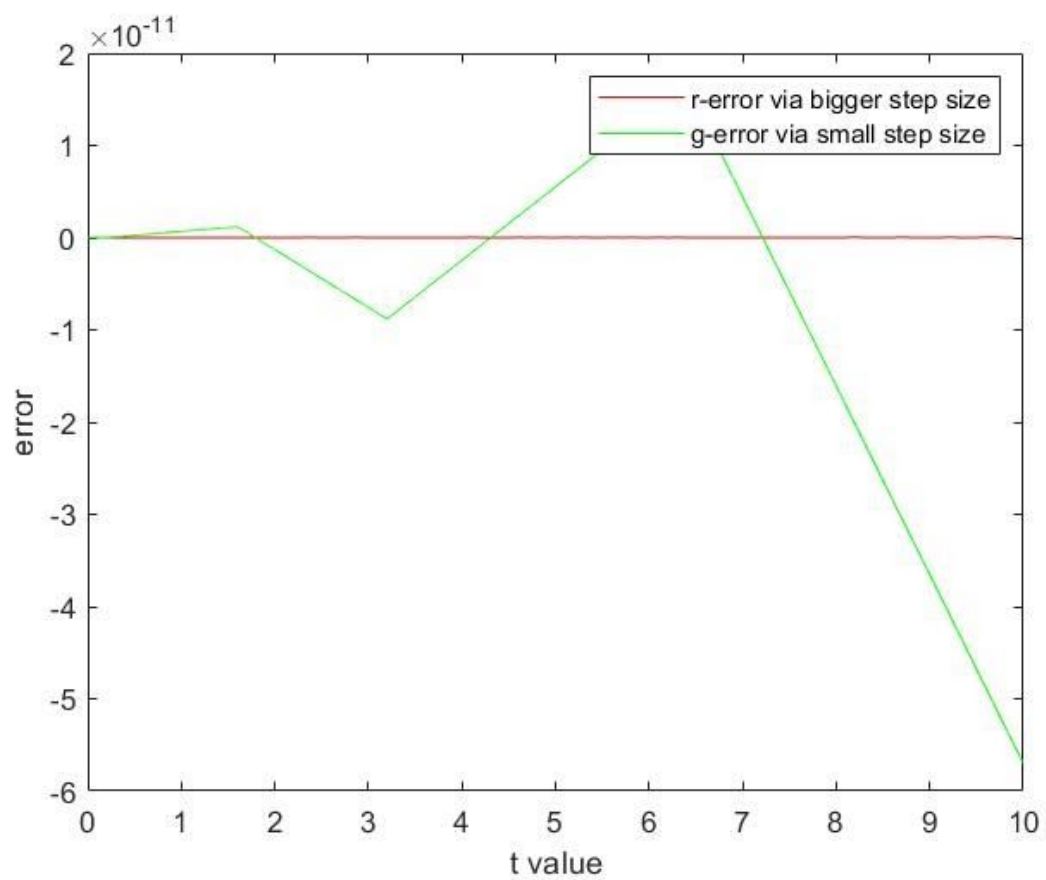
Arkaprabha Banerjee 201801408  
Shantanu Tyagi 201801015

## 2 Basic Physical Systems of Growth and Decay

**2.1**  $f(x) = 40$  ;  $x(0) = 0$  ;  $0 \leq t \leq 10$  ,  $\Delta t = 0.1$  ,  $\Delta t = 0.001$

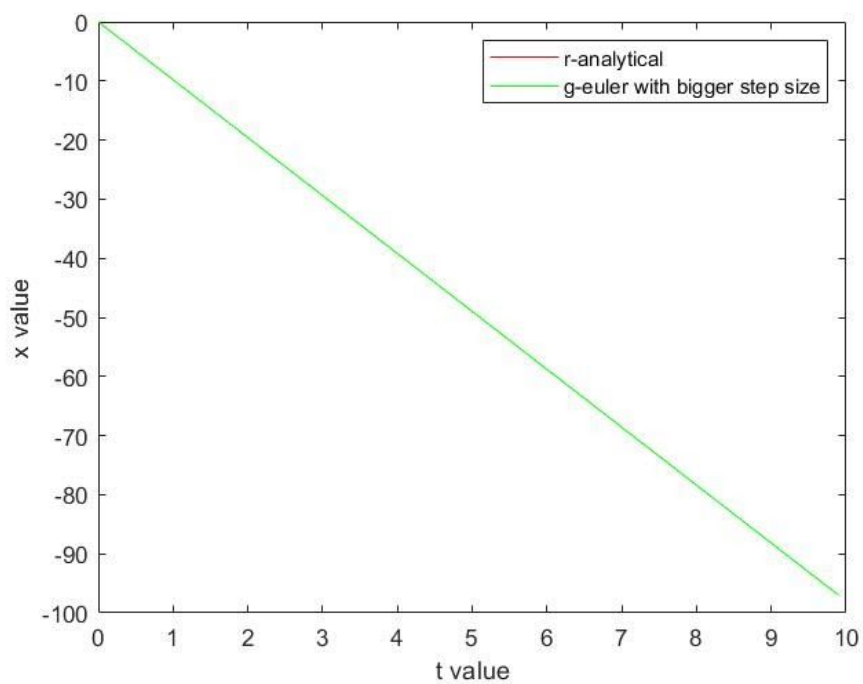
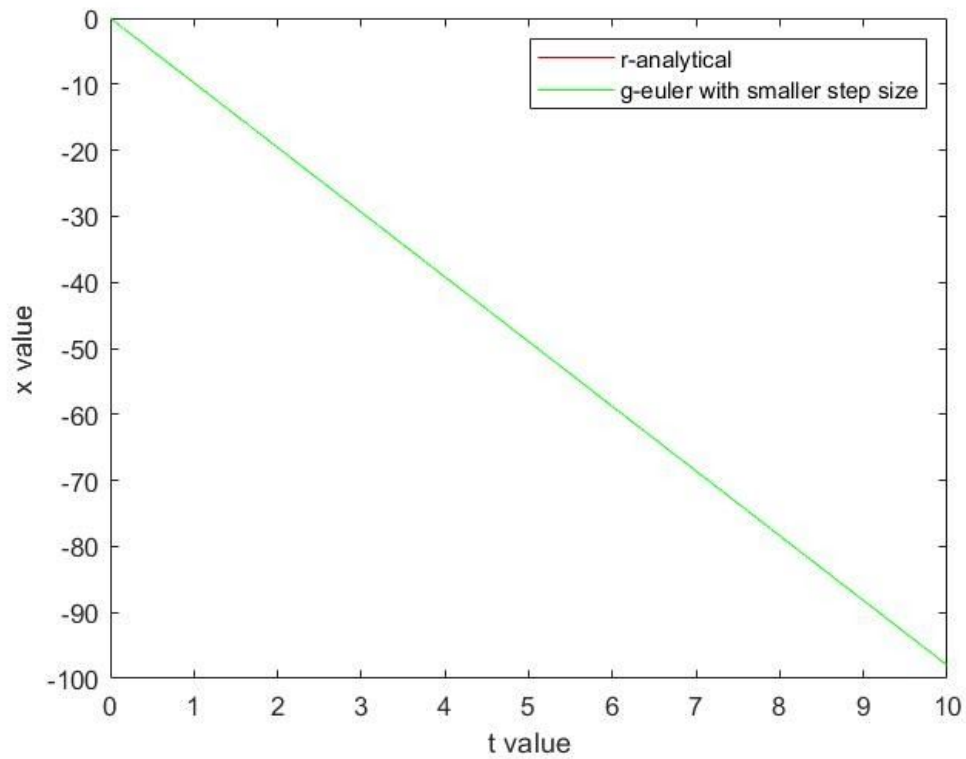
**Analytical solution :**  $x(t) = 40 * t$

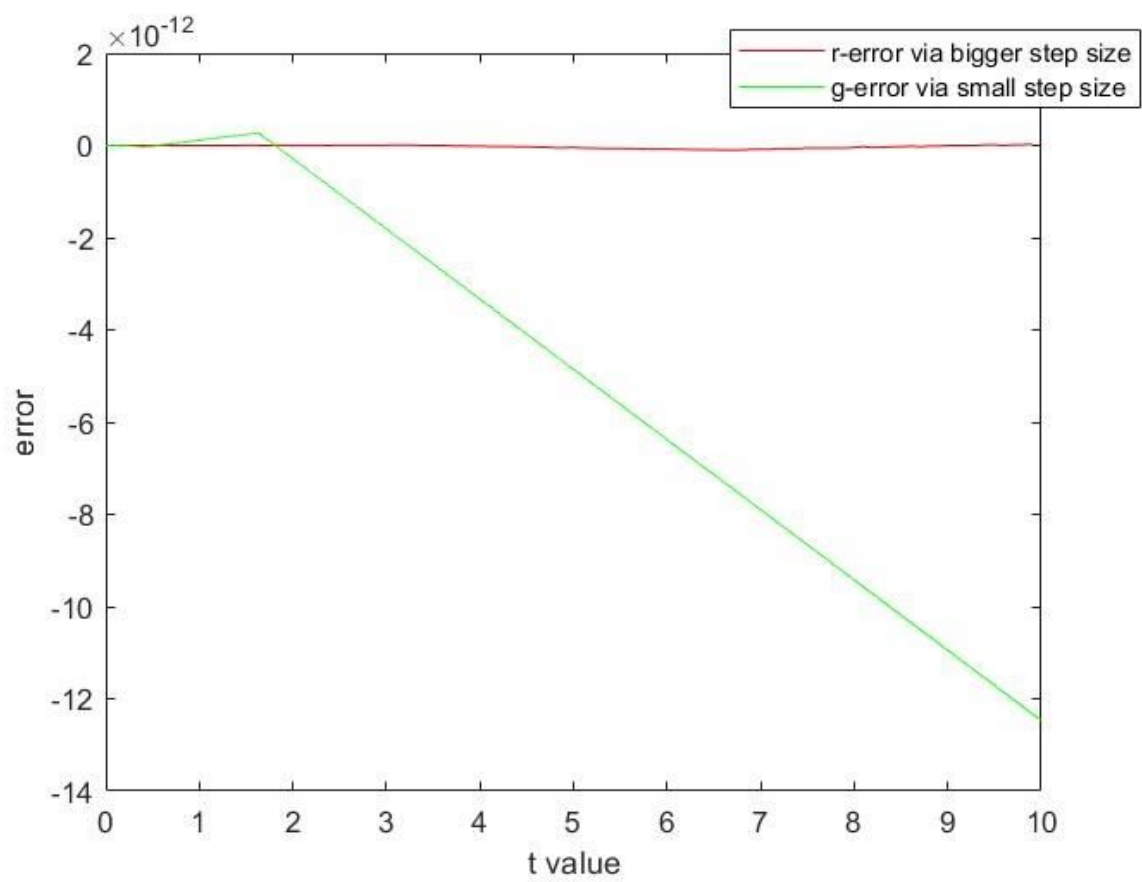




**2.2**  $f(v) = -9.8$  ;  $v(0)=0$  ;  $0 \leq t \leq 10$ ,  $\Delta t = 0.1$ ,  $\Delta t = 0.001$

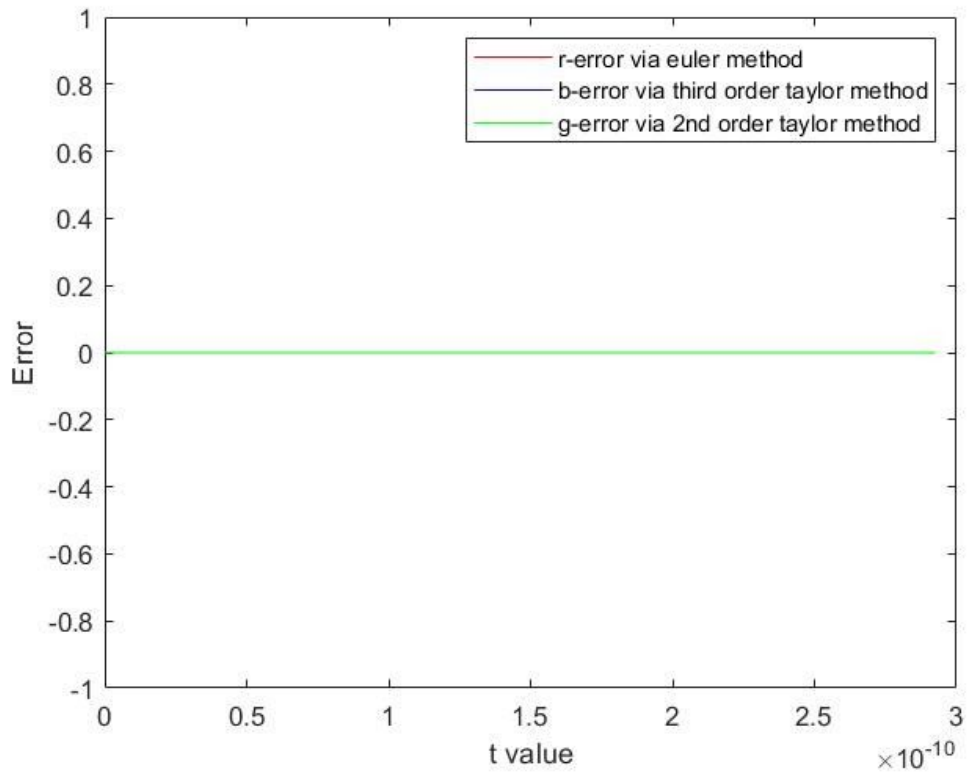
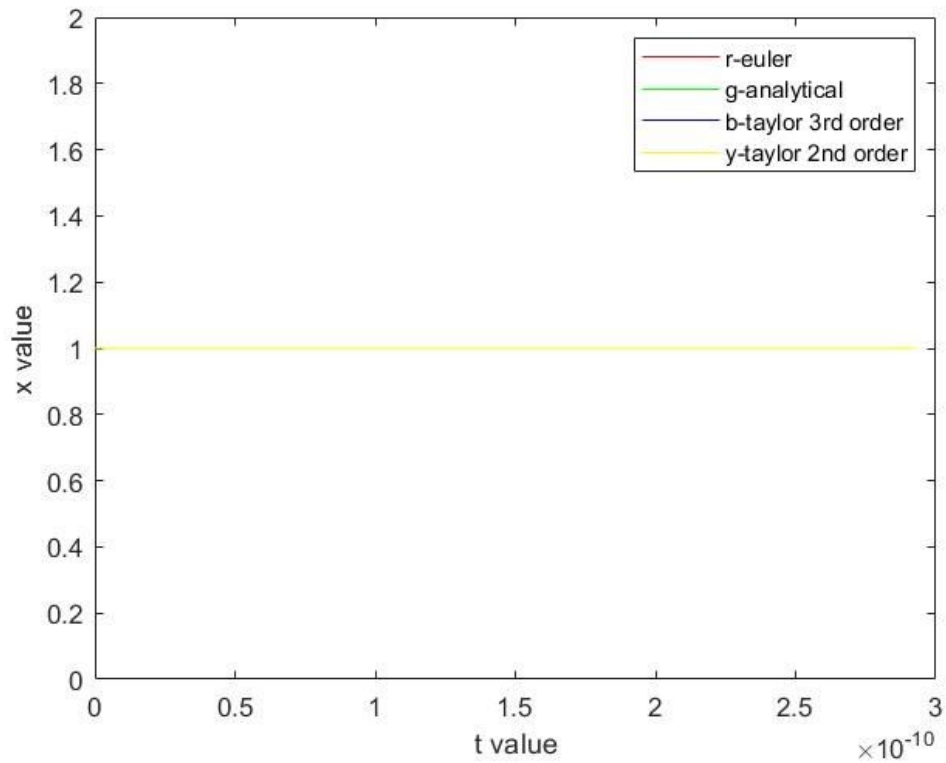
**Analytical Solution :**  $v(t) = -9.8 * t$





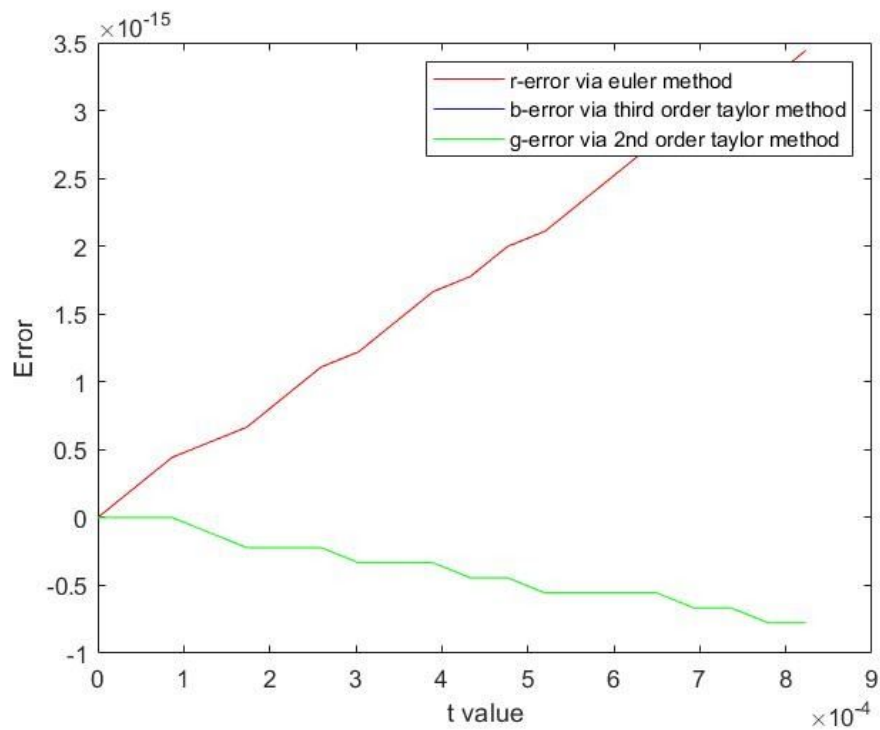
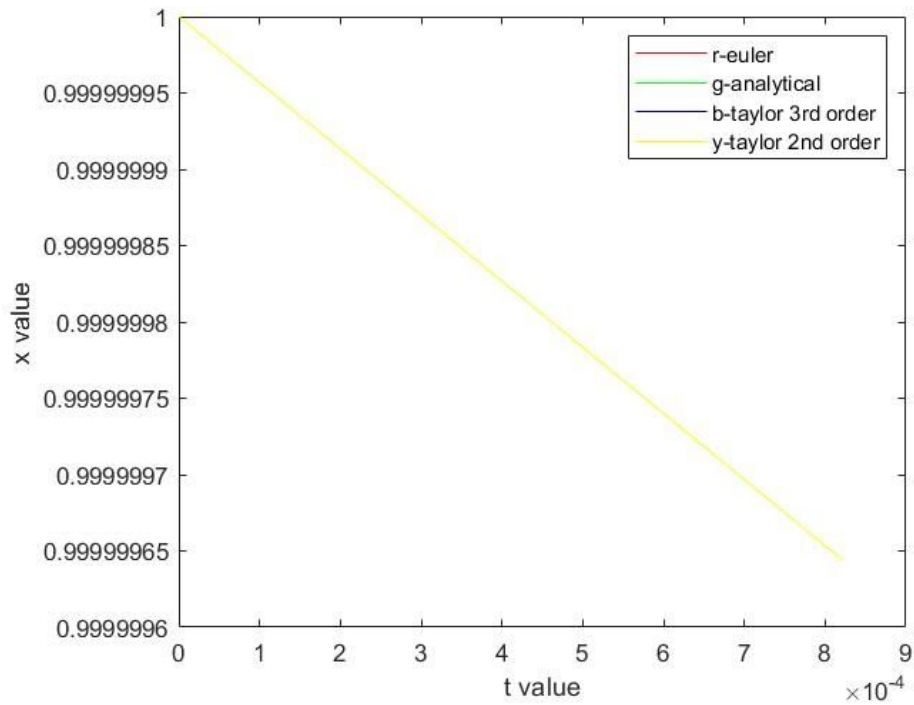
**2.3.1**  $f(x) = -1.54 * 10^{-10} * x$  ;  $x(0)=1$  ;  $0 \leq t \leq 3.08*10^{-11}$  ,  $\Delta t = -1.54 * 10^{-12}$

**Analytical Solution :**  $x(t) = e^{-t*1.54*(10^{-10})}$



**2.3.2**  $f(x) = -4.3321 * 10^{-4} * x$  ;  $x(0)=1$  ;  $0 \leq t \leq 8.6642 * 10^{-5}$  ,  $\Delta t = 4.3321 * 10^{-6}$

**Analytical Solution :**  $x(t) = e^{-t*4.3321*(10^{-4})}$



**2.3.3**  $f(x) = -0.0315 * x$  ;  $x(0)=1$  ;  $0 \leq t \leq 6.3*10^{-3}$  ,  $\Delta t = 3.15 * 10^{-4}$

**Analytical Solution :**  $x(t) = e^{-t*0.0315}$

