CHRIST (Deemed to be University)
DEPARTMENT OF MATHEMATICS
LA-III and IV
December-2018
MAT-451 Mathematical Models Using Python Programming

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1. Solve $\frac{dy(t)}{dt} = -ky(t)$ with parameter $k = 0.5$ and the initial condition $y_0 = 10$.
2. Solve the above problem for $k = 0.1, 0.4, 0.6, 0.7$ and 0.9
3. Solve $7\frac{dy(t)}{dt} = -y(t) + u(t)$, $y(0) = 2$ u steps from 0 to 2 at $t = 12$
4. Solve $\frac{dy}{dx} - 2y = 0$ with $y(0) = 5$

LA-IV

1. A culture initially has P_0 number of bacteria. At t = 1 h the number of bacteria is measured to be $\frac{5}{2}P_0$. If the rate of growth is proportional to the number of bacteria $P(t)$ present at time t, determine the time necessary for the number of bacteria to triple.
2. Expain Logistic growth with two examples.
