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|  | **BAHRIA UNIVERSITY, (Karachi Campus)**  *Department of Software Engineering*  **Assignment IV - Fall 2024** |  |

COURSE TITLE: **NUMERICAL ANALYSIS** COURSE CODE: **GSC-321**

Class: **BSE-VII (A,B)** Time Allowed:  **1 Week.**

Course Instructor: **Engr. Zoobia Zeeshan** Max. Marks: **5 marks**

Submission Date: **25-12-2024**

**Question No. 1 [CLO3: 10 Marks]**

**Scenario:**  
A car is moving along a straight road, and its position x(t) at time t is given by the first-order differential equation:

dx/dt=2−0.5x(t)

Where:

* x(t) is the position of the car at time t (in meters),
* dx/dt is the acceleration of the car,
* 2 represents a constant acceleration,
* 0.5x(t) represents the deceleration that depends on the position of the car.

The car starts at position x(0)=0 meters, with an initial velocity dx/dt(0)=10meters per second at time t=0

Using the Taylor Series expansion, estimate the position of the car at times t=1,2,3,4,5 seconds with a step size h=1 second.

* Strictly follow the given deadline.