National University of Sciences & Technology

School of Electrical Engineering and Computer Science

Department of Humanities & Sciences

MATH-351: Numerical Methods (3+0): 2k20-BEE-12CD Spring-2023

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| Assignment # 2 | |
| CLO1: Explain the consequences of finite precision and describe the amount of error inherent in different Numerical methods.  CLO2: Define algorithms for different Numerical techniques.  CLO-3: Apply different computational techniques to solve Mathematical problems arising in engineering and sciences. | |
| Maximum Marks: 10 | Due date: 04 May 2023 |

**Note: Perform all necessary steps in computing unknowns, otherwise marks will be deducted.**

**Question: The velocity profile of a rocket against time is give as below**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **t** | **0** | **10** | **15** | **20** | **22.5** | **30** |
| **v(t)** | **0** | **227.04** | **362.78** | **517.35** | **602.92** | **901.67** |

**Using cubic splines (6 data points so all possible cubic splines will be 5) to compute**

1. **Velocity at t=16 seconds**
2. **Acceleration at t=21 seconds**
3. **Distance travelled by rocket between t=23 and t=29.**