Assignment-2
Total Marks: 20

1. Consider the following table of data points/nodal points:

Time t (sec)	Velocity (ms^-1)
2	10
4	20
6	25

a. [3+1 marks] Find an interpolating polynomial of velocity that goes through the above data points by using Vandermonde Matrix method. Also compute an approximate value of acceleration at Time, t=7 sec.
b. [4 marks] Find an interpolating polynomial of velocity that goes through the above data points by using the Lagrange method.
c. [2 marks] If a new data point is added in the above scenario, which method should you use in finding a new interpolating polynomial? Also what will be the degree of that new Polynomial?

2. Read the following and answer accordingly:
a. (4 marks) Consider the nodes $[-\pi/2, 0, \pi/2]$. Find an interpolating polynomial of appropriate degree by using Newton's divided-difference method for $f(x) = x \sin(x)$.
b. (2 marks) Use the interpolating polynomial to find an approximate value at $\pi/4$, and compute the percentage relative error at $\pi/4$.
c. (4 marks) Add a new node π to the above nodes, and find the interpolating polynomial of appropriate degree.