**Institute of Information Technology & Management**

**Assignment - III**

**Unit - III**

**Solution of Simultaneous Equations, Numerical Differentiation & Numerical Integration**

**Batch: BCA Semester: II**

**Subject: Applied Mathematics Paper Code: 102**

1. Given that y = logx and

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| x | 4.0 | 4.2 | 4.4 | 4.6 | 4.8 | 5.0 | 5.2 |
| y | 1.3863 | 1.4251 | 1.4816 | 1.5261 | 1.5686 | 1.6094 | 1.6487 |

Evaluate using Simpson’s 1/3 rd rule?

1. A tank is discharging water through an orifice at a depth of x meter below the surface of the water whose area is Am2. Following are the values of x for the corresponding values A.

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| A | 1.257 | 1.39 | 1.52 | 1.65 | 1.809 | 1.962 | 2.295 | 2.462 | 2.650 | 2.827 |
| x | 1.5 | 1.65 | 1.8 | 1.95 | 2.1 | 2.25 | 2.55 | 2.7 | 2.85 | 3 |

Using the formula (0.018) T = , calculate T, the time (in seconds) for the level of the water to drop from 3.0 to 1.5m above the orifice.

1. Using Gauss seidel iteration method, solve the system of equations 10x-2y-z-w =3, -2x+10y-z-w=15, -x-y+10z-2w=27?
2. Find the maximum value of step size that can be used in the trapezoidal rule of f(x) = sinx in [1, 3] so that the error in linear interpolation is less than or equal to 1.25 x 10-7
3. Solve by LU Decompositionmethod x +2y +3z = 14, 2x +5y +2z = 18, 3x + y + 5z =20?
4. Solve by gauss Jordan method 2x –3y +z = -1, x +4y +5z = 25, 3x-4y +z =2?
5. Solve by Jacobi method 27x +6y -z = 85, 6x +15y +2z = 72, x + y + 54z =110?
6. From the following data find the value of f’(0)

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **x** | 0 | 1 | 2 | 3 | 4 | 5 |
| **y** | 4 | 8 | 15 | 7 | 6 | 2 |