DEPARTMENT OF MATHEMATICS

BIRLA INSTITUTE OF TECHNOLOGY MESRA, RANCHI

**IMM5002 Numerical Method Lab, Session: (MO-19)**

# Lab Assignment - 5

---

1. Use Lagranges's interpolation formula to find the value of $y$ when $x = 10$, if the following values of $x$ and $y$ are given:

| $x$ | 5 | 7 | 11 | 13 | 17 |
|---|---|---|---|---|---|
| $y$ | 150 | 392 | 1452 | 2366 | 5202 |

2. From the following table, find $y$ when $x = 1.85$ and 2.25 by Newton's interpolation formula.

| $x$ | 1.7 | 1.8 | 1.9 | 2.0 | 2.1 | 2.2 | 2.3 |
|---|---|---|---|---|---|---|---|
| $y = e^x$ | 5.474 | 6.050 | 6.686 | 7.389 | 8.166 | 9.025 | 9.974 |

3. Find the Newton's forward interpolating polynomial of degree 10 that interpolates the function $\tan^{-1}(x)$ at 11 equally spaced points in the interval [0 6]. Print the coefficients of the polynomial. Compute and print the difference between the polynomial and the function at 33 equally spaced points in the interval [0 8]. What conclusion can be drawn ?

---