

**SRM Institute of Science and Technology**

**Department of Mathematics**

**21MAB206T- Numerical Methods and Analysis**

**UNIT –II Tutorial Sheet-2**

**Part-A**

1. Find the divided difference table for the following data.

x	4	5	7	10	11	13
y	48	100	294	900	1210	2028

2. Find the divided difference table for the following data.

x	2	5	10
y	5	29	109

3. State all the properties of divided difference.  
4. Write the inverse Lagrange's interpolation formula.

**Part - B**

5. Using Newton's divided difference formula find the missing value from the table. (**Ans: 3**)

x	1	2	4	5	6
θ	14	15	5	-	9

6. Using Newton's divided difference formula, find  $u(3)$  given  
 $u(1) = 26, u(2) = 12, u(4) = 256, u(6) = 844$ . (**Ans: 100**)  
7. Find the missing term in the following table using Lagrange's interpolation. (**Ans: 31**)

x	0	1	2	3	4
y	1	3	9	-	81

8. Find the age corresponding to the annuity value 13.6 given the table (**Ans : 43**)

Age (x)	30	35	40	45	50
Annuity value (y)	15.9	14.9	14.1	13.3	12.5

9. Using Newton's backward formula, find the polynomial of degree 3 passing through (3,0), (4,24), (5,60) and (6,120). (**Ans :  $y = x^3 - 3x^2 + 2x$** )

10. Use Newton's forward difference formula to construct an interpolating polynomial of degree 3 for the data:

$$f(-0.75) = -0.07181250, f(-0.5) = -0.024750, f(-0.25) = 0.33493750, f(0) = 1.10100$$

Hence find  $f\left(\frac{-1}{3}\right)$ . (**Ans:  $y = x^3 + 4.001x^2 + 4.002x + 1.101$** )