



SNS COLLEGE OF TECHNOLOGY

(An Autonomous Institution)

19MAT202 – STATISTICS AND NUMERICAL METHODS



16 Questions and Answers

PART B

- 1 Use Lagrange's interpolation, calculate the profit in the year 2000 from the following data
Year : 1997 1999 2001 2002
Profit in lakhs of RS : 43 65 159 248
- 2 Find the third degree polynomial of $f(x)$ satisfying the following data
X : 1 3 5 7
Y : 24 120 336 720
- 3 Find the polynomial $f(x)$ by using Lagrange's formula and hence find $f(3)$ for
X : 0 1 2 5
f(x) : 2 3 12 147
- 4 Using Lagrange's interpolation formula find $y(10)$ given that
 $y(5)=12, y(6)=13, y(9)=14, y(11)=16$
- 5 Obtain the root of $f(x) = 0$ by Lagrange's inverse interpolation given that $f(30) = -30$,
 $f(34) = -3, f(38) = 3, f(42) = 18$.
- 6 Find the missing term in the following table using Lagrange's interpolation
X : 0 1 2 3 4
Y: 1 3 9 - 81
- 7 Using Newton's divided difference formula, find $u(3)$ given $u(1) = -26, u(2) = 12, u(4) = 256, u(6) = 844$.
- 8 Find $f(x)$ as a polynomial in x for the following data by newton's divided difference formula:
X : -4 -1 0 2 5
f(x): 1245 33 5 9 1335
- 9 Find $f(8)$ by newton's divided difference formulae for the data:
X : 4 5 7 10 11 13
f(x) : 48 100 294 900 1210 2028
- 10 Find $f'(3)$ and $f''(3)$ for one following data:
X : 3.0 3.2 3.4 3.6 3.8 4.0

F(X) : -14 -10.032 -5.296 -0.256 6.672 14

11 Compute $f'(0)$ and $f'(4)$ from the data

X:	0	1	2	3	4
Y:	1	2.718	7.381	20.086	54.598

12 The following data gives the velocity of a particle for 20 seconds at an interval of 5 seconds .find the initial acceleration using the entire data

Time(sec)	:	0	5	10	15	20
Velocity(m/sec)	:	0	3	14	69	228

13 Find the maximum and minimum value of y tabulated below:

X:	-2	-2	0	1	2	3	4
Y:	2	-.25	0	-.25	2	15.75	56

14 Using trapezoidal rule ,evaluate $\int_{-1}^1 \frac{dx}{1+x^2}$ taking 8 intervals

15 Evaluate $\int_0^1 \frac{dx}{1+x^2}$ with $h=\frac{1}{6}$ by trapezoidal rule.

16 Evaluate the integral $\int_1^2 \frac{dx}{1+x^3}$ by using trapezoidal rule with two sub intervals.

17 Dividing the range into 10 equal parts, find the value of $\int_0^{\pi/2} \sin x \, dx$ by (i) Trapezoidal rule (ii) Simpson's rule.

18 Using Simpson's one third rule evaluate $\int_0^1 x e^x \, dx$ taking 4 intervals. Compare your result with actual value.

19 Evaluate $\int_0^6 \frac{dx}{1+x^2}$ by using (i) Trapezoidal rule (ii) Simpson's rule. Also check up result by actual integration.

20 By dividing the range into ten equal parts, Evaluate $\int_0^{\pi} \sin x \, dx$ by using (i) Trapezoidal rule (ii) Simpson's rule. Also check up result by actual integration.