



UNIT-III

PART B

1. The Population of a certain town is given below. Find the rate of growth of the population in 1931 and 1971.

Year(x)	1931	1941	1951	1961	1971
Population in thousands(y)	40.62	60.80	79.95	103.56	132.65

2. Compute $f'(0)$ and $f''(4)$ from the following data

x:	0	1	2	3	4
y:	1	2.718	7.381	20.086	54.598

3. 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

4. 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

5. Find the first and second derivative at $x=1.05$ from

X	1.05	1.1	1.15	1.2	1.25	1.3
Y	1.025	1.049	1.072	1.095	1.118	1.14

6. Find the maximum and minimum value of y tabulated below:

X:	-2	-2	0	1	2	3	4
Y:	2	-0.25	0	-0.25	2	15.75	56



7. Find the maximum and minimum value of y from the data

X 0 1 2 3 4 5

Y 0 $\frac{1}{4}$ 0 $\frac{9}{4}$ 16 $\frac{225}{4}$

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

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

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

11. 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.

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

13. 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.

14. 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.

15. Evaluate the integral $I = \int_1^2 \int_1^2 \frac{dx \, dy}{x+y}$ using Trapezoidal rule with
i) $h = k = 0.5$ ii) $h = k = 0.25$

16. Evaluate $I = \int_0^1 \int_1^2 \frac{2xy \, dx \, dy}{(1+x^2)(1+y^2)}$ by Trapezoidal rule with $h = k = 0.25$

17. Evaluate $I = \int_4^{4.4} \int_2^{2.6} \frac{dy \, dx}{xy}$ by using
i) Trapezoidal Rule ii) Simpson's Rule

18. Evaluate $I = \int_0^{\pi/2} \int_{\pi/2}^{\pi} \cos(x+y) \, dx \, dy$ using Trapezoidal rule and Simpson's rule

19. Evaluate $I = \int_0^{0.5} \int_0^1 e^{xy} \, dx \, dy$ by Simpson's rule with $h = 0.5$ and $k = 0.25$.



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