



Parul University
Faculty of Engineering and Technology
Parul Institute of Engineering and Technology
Department: AI-ML/AI-RO/AI/AI-DS/CSE/MICRO/SAP/QUICK/ORACLE/IT/AERO

Subject Name	PROBABILITY, STATISTICS AND NUMERICAL METHODS	A.Y	2025/2026	
Subject Code	303191251		Semester	4th
Assignment-3				
Sr No	Question	COs	B.T	Competence
1	Find the area bounded by the curve and the x-axis from x = 7.47 to x = 7.52 from the following table using the trapezoidal rule : x: 7.47, 7.48, 7.49, 7.50, 7.51, 7.52 f(x): 1.93, 1.95, 1.98, 2.01, 2.03, 2.06	6	3	Apply
2	A river is 80 metres wide. The depth <i>d</i> (in metres) at a distance <i>x</i> metres from one bank is: x: 0, 10, 20, 30, 40, 50, 60, 70, 80 y: 0, 4, 7, 9, 12, 15, 14, 8, 7 Calculate the area of the cross-section using Simpson's 1/3 rule .	6	3	Apply
3	The velocity of a train starting from rest is given below (time in minutes, speed in km/h): Time: 3, 6, 9, 12, 15, 18 Velocity: 22, 29, 31, 20, 4, 0 Estimate the distance covered in 18 minutes using Simpson's 3/8 rule .	6	3	Apply
4	Solve $\frac{dy}{dx} = 2y + 3e^x, y(0) = 1$ using the Taylor's series method . Find approximate values of y at x = 0.1 and x = 0.2 .	6	3	Apply
5	Use Taylor's series method to solve $\frac{dy}{dx} = x^2 y - 1, y(0) = 1.$ Find y(0.03) .	6	3	Apply
6	Using Euler's method find the approximate value of y at x = 1.5 , taking h = 0.1 . Given: $\frac{dy}{dx} = \frac{y - x}{\sqrt{xy}}, y(1) = 2.$	6	3	Apply
7	Use trapezoidal rule to evaluate $\int_0^2 \frac{x}{\sqrt{2+x^2}} dx$ dividing the interval into four equal parts.	6	4	Apply

8	Calculate $\int_1^2 e^x dx$ with n = 10 using the trapezoidal rule.	6	3	Apply
9	Evaluate $\int_0^\pi \frac{\sin^2(x)}{5 + 4\cos(x)} dx$ using Simpson's 3/8 rule .	6	4	Analyse
10	Evaluate $\int_0^1 e^{-x^2} dx$ using Gaussian quadrature formula with n = 3 .	6	3	Analyse
11	Using the fourth-order Runge-Kutta method , solve: $10 \frac{dy}{dx} = x^2 + y^2, y(0) = 1$ at x = 0.1 and x = 0.2 , taking h = 0.1 .	6	4	Analyse