PARUL UNIVERSITY
Faculty of Engineering & Technology
Department of Applied Sciences and Humanities
1ST SEMESTER B.Tech PROGRAMME (CSE, IT)
CALCULUS(03019101BS01)
ACADEMIC YEAR – 2025-26

Tutorial 1B: Application of Functions of One Variable

Q. 1 Use the four rectangles to find the approximation of the area of the region lying between the graph of $f(x) = x^3$ between 1 and 3.

Q. 2 Using Riemann integral evaluate $\int_0^2 f(x)dx$, where

$$f(x) = \begin{cases} x & 0 \le x \le 1 \\ 2 - x & 1 \le x \le 2 \end{cases}$$

Q. 3 Using Riemann integral evaluate $\int_{-1}^1 f(x)dx$ where $f(x) = |x|$.

Q. 4 Evaluate the integral using definition $\int_0^2 (x^2 + 1)dx$ using Riemann sum with equal subdivisions.

Q. 5 Find the area between the curves $y = x^2$ and $y = x$ from $x = 0$ to $x = 1$.

Q. 6 Find the area of the region bounded between $y = \sqrt{x}$ and $y = x$.

Q. 7 Find the area between the curves $y = x^2$ and $y = x + 2$.

Q. 8 Find the length of the curve $y = x^2$ from $x = 0$ to $x = 1$.

Q. 9 Find the volume of the solid obtained by rotating the region under $y = x^2$ from $x = 0$ to $= 2$, about x-axis.

Q. 10 Find the volume of the solid obtained by rotating the region under $y = \sqrt{x}$ from $x = 0$ to $x = 4$ about x-axis.