Department of Physics
Indian Institute of Technology
Kharagpur-721302, West Bengal, India

Subject No. PH49012 (Computational Physics Lab)

Lab Sheet - 8

§1. Calculate the integral $I = \int_0^1 (\sin\theta/\theta)\, d\theta$ using Trapezoidal rule, Simpson's $1/3^{rd}$ rule, and interpolation rule (take $n = 3$). Compare the results.

§2. The density is given by $\rho(x) = A\, e^{-x^2}$, find the constant A by normalizing the density. Take the x range between $[-10, 10]$. Then, calculate the first two moments $< x >$ and $< x^2 >$.

§3. Evaluate the integral $\int_0^4 \int_{(x-2)^2}^{6} (5\,42y^2 - 12x)\, dx\, dy$.

§4. Evaluate the integral $\int_0^2 \int_0^{2\sqrt{y}} 5\, x^3 \cos(y^3)\, dx\, dy$.