

UMC-202
PROBLEM SET 5

- (1) Approximate the integral of $f(x)=x^3 + 5x^2 + 1$ on the interval $[1,5]$ by using composite rectangular method and composite mid point method
- (a) with five sub intervals,
 - (b) with ten sub intervals, (Which approximation is much closer to the correct answer)
 - (c) Compute the true error in both the cases.

- (2) Redo Problem 1 by using composite Trapezoidal method and composite Simpson method.

- (3) Evaluate the following integral by using one point Gauss quadrature and compute the true error.

$$\int_0^{\pi/2} x \sin x \, dx$$

- (4) Redo Problem 11 by using two point Gauss quadrature formula.

- (5) Use Composite Simpson's rule with $n = 4$ and $m = 2$ to approximate

$$\int_{1.4}^{2.0} \int_{1.0}^{1.5} \ln(x + 2y) \, dy \, dx.$$

- (6) Redo Problem 5 using the Gaussian quadrature formula with $n = 1$, $n = 2$ in both dimensions.