

Assignment-I Module-I

B.Tech. (MNC) 5th Semester

Scientific Computing

Q.1 From the data given below, find the number of students whose weight is between 100 and 110.

weight	0-40	40-60	60-80	80-100	100-120
Number of students	205	120	100	70	50

Q.2 Apply a central difference formula to obtain $f(32)$ given that $f(25) = 0.2707$, $f(30) = 0.3027$, $f(35) = 0.3386$, $f(40) = 0.3794$.

Q.3 The following table gives the specific heat of ethyl alcohol at different temperatures. Estimate the specific heat corresponding to $15^{\circ}C$ and $25^{\circ}C$.

t	0	10	20	30	40	50
Specific heat (y)	0.51	0.55	0.57	0.59	0.62	0.67

Q.4 Find the missing term in the table using Lagrange's interpolation

x	0	1	2	3	4
y	1	3	9	-	81

Q.5 Evaluate $\int_0^1 e^{-x^2} dx$ dividing the range into 4 equal parts by trapezoidal rule.

Q.6 The velocity v of a particle at distances from a point on its path is given by the table below.

s in meters	0	10	20	30	40	50	60
v in m/sec	47	58	64	65	61	52	38

Estimate the time taken to travel 60 meters by using simpson's 1/3 rule.

Q.7 Dividing the range into 10 equal parts find the approximate value of $\int_0^\pi \sin x dx$ using simpson's rule.

Q.8 Evaluate $\int_0^5 \frac{dx}{4x+5}$ by weddle's rule using 13 co-ordinates.

Q.9 Find $\int_{0.2}^{1.5} e^{x^2} dx$ by Gauss three point quadrature formula.

Q.10 Find a real root of the equation $x^3 - x - 11 = 0$ between 2 and 3 upto four places of decimal.

Q.10 Find by Newton-Raphson method correct to four places of decimals the root of the equation $3x - \cos x - 1 = 0$.

Q.10 Find a root of the equation $x^3 - 3x - 5 = 0$ by the secant and Regula falsi method upto three places of decimal.