Enrollment No. _____

NAVRACHANA UNIVERSITY
a UGC recognized University

School: School of Science
Program/s: BSc Chemistry
Year: 2nd **Semester:** 3rd
Examination: End Semester Examination
Examination year: December 2022

Course Code:	MA151	**Course Name:**	Numerical Methods		
Date:	12/12/2022			**Total Marks:**	40
Time:	11:30 am to 01:30 pm			**Total Pages:**	1

nstructions:

- *Write each answer on a new page.*
- *Use of a calculator is permitted*

Q. No.	Details	Marks	CO's	BTL
Q.1	Attempt the following		**CO1, CO2, CO3, CO4**	**1,2,3**
[1]	Using trapezoidal rule, compute the area bounded by the curve described in the following table: [consider h=0.01]	**[06]**		
[2]	Find a root lies between 1 and 2 of the equation $x^3 - x - 1 = 0$ using bisection method. [Calculate up to 5th iteration]	**[06]**		
[3]	Write significant digits of the following numbers: (1) 3.14159 (2) 1000 (3) 0.0035 (4) 30.056	**[04]**		
Q.2	Attempt **ANY THREE** of the following: (8 Marks Each)	**[24]**	**CO1, CO2, CO3, CO4**	**1,2,3**
[1]	Apply Gauss Elimination method to solve the following system of equation: $x + y + 5z = -1,\quad 2x + 4y = 12,\quad 5x - y + z = 10$			
[2]	Find $y(1.4)$ for $\frac{dy}{dx} = \frac{y}{x}$, *where* $y(1) = 1$ with h=0.2 using Euler's method.			
[3]	Using Newton-Raphson's method, find a root of the equation correct to two decimal places of the equation $x^3 - 2x - 5 = 0$. Consider $x_0 = 2$.			
[4]	The population of the town in the census is as given in the data. Using Newton's back word difference interpolation formula to estimate the population in the year 1996.			

X:	1.47	1.48	1.49	1.50	1.51	1.52
F(x)	3.86	3.90	3.96	4.02	4.06	4.12

Year (x):	1961	1971	1981	1991	2001
Population(y): (in thousands)	46	66	81	93	101

**********End of Question Paper**********