Enrollment No.

NAVRACHANA UNIVERSITY
a UGC recognized University

School: School of Science
Program/s: BSc Chemistry
Year: 1st **Semester:** 1st
Examination: End Semester Examination
Examination year: December 2022

Course Code:	MA125	**Course Name:**	Elementary Calculus		
Date:	14/12/2022			**Total Marks:**	40
Time:	08:30 am to 10:30 am			**Total Pages:**	1

Instructions:

- *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
[1]	Find domain and range of the following functions (1) $f(x) = 1 + x^2$ (2) $f(x) = \frac{1}{\sqrt{x}}$ (3) $f(x) = 1 - \sqrt{x}$	**[06]**		
[2]	Give an interval where function $f(x) = x^2$ is increasing and decreasing.	**[02]**		
[3]	Recognize even and odd functions from the following: (1) $f(x) = x^2 + 1$ (2) $f(x) = x + x^2$	**[02]**		
Q.2	Attempt **ANY FIVE** of the following: (6 Marks Each)	**[30]**	**CO1, CO2, CO3, CO4**	1,2
[1]	Evaluate limit of the following: (1) $\lim_{x\to\infty} \frac{4x^3+5}{x^3-x+7}$ (2) $\lim_{x\to\infty} \frac{2x^3-1}{3x^2-x+10}$			
[2]	If $x = a(\cos\theta + \theta\sin\theta)$, $y = a(\sin\theta - \theta\cos\theta)$, find d^2y/dx^2.			
[3]	Find $\frac{\partial f}{\partial x}, \frac{\partial f}{\partial y}$ *and* $\frac{\partial f}{\partial z}$ for the function $f(x,y,z) = yz \cdot \ln(xy)$			
[4]	Using chai rule, find $\frac{\partial w}{\partial u}$ *and* $\frac{\partial w}{\partial v}$ at u=1/2 and v=1. Given $w = xy + yz + zx$, $x = u + v$, $y = u - v$, $z = uv$			
[5]	Find $\int \frac{dx}{(x+1)(x+2)}$.			
[6]	Evaluate: $\int_0^{\frac{\pi}{2}} x \cdot \cos x \, dx$.			

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