SHRI RAMSWAROOP MEMORIAL UNIVERSITY

End Semester Examination (2021-22)-Odd Semester

BCA – I Year (I Sem)	
Course Name: Mathematics-I	Code: BMA1006
Time: 02 Hours	Max Marks: 60

University Roll No.															
(To be filled by the Student)															

Note: Please read instructions carefully:

a) The question paper has 03 sections and it is compulsory to attempt all sections.

b) All questions of Section A are compulsory; questions in Section B and C contain choice.

Section A: Very Short Answer type Questions **Attempt all the questions.**		**BL**	**CLO**	**Marks (10)**
1.	Describe difference between matrix and determinant.	BL1	CLO1	02
2.	Find the value of the integral $\int x \sin x \, dx$.	BL1	CLO3	02
3.	Define Non-linear differential equation.	BL1	CLO3	02
4.	Is $f(x) = x^3$ continuous at $x = 2$?	BL1	CLO2	02
5.	Find the multiplicative inverse of $(\cos\theta + i\sin\theta)$.	BL1	CLO4	02
Section B: Short Answer Type Questions **Attempt any 03 out of 06 questions.**		**BL**	**CLO**	**Marks (30)**
1.	Evaluate: $\int \sec^3 x \, dx$.	BL2	CLO3	10
2.	Find the inverse of the matrix $A = \begin{bmatrix} 0 & 1 & 2 \\ 1 & 2 & 3 \\ 3 & 1 & 1 \end{bmatrix}$.	BL2	CLO1	10
3.	Find the value of $\int_0^{\pi/2} \frac{\sqrt{\tan x}}{\sqrt{\tan x} + \sqrt{\cot x}} \, dx$.	BL2	CLO3	10
4.	Verify that $y = ae^{2x} + be^{-x}$ is a solution of the differential equation $\frac{d^2y}{dx^2} - \frac{dy}{dx} - 2y = 0$.	BL3	CLO3	10
5.	Find the rank of the matrix $\begin{bmatrix} 2 & 3 & -1 & -1 \\ 1 & -1 & -2 & -4 \\ 3 & 1 & 3 & -1 \end{bmatrix}$.	BL2	CLO1	10
6.	Discuss the differentiability and continuity of the given function $f(x) = \lvert x-2 \rvert$ at $x = 2$.	BL3	CLO2	10

Section C: Long Answer Type Questions. **Attempt any 01 out of 04 questions.**		**BL**	**CLO**	**Marks (20)**
1.	Investigate for consistency of the following equations and if possible, find the solution : $x+y+z=3$ $x+2y+3z=4$ $x+4y+9z=6$	BL4	CLO1	20
2.	Describe order and degree of ordinary differential equation. Also solve the differential equation **:** $\log\left(\frac{dy}{dx}\right)=(ax+by)$.	BL3	CLO3	20
3.	Prove that $\int_0^{\pi/2}\log\cos x dx=-\frac{\pi}{2}\log 2$ and find $\frac{dy}{dx}$ if $y=(e^x\sin x+\sec x.\log x)$.	BL3	CLO3	20
4.	Find modulus, amplitude and square root of the following complex number $1+\sqrt{3}i$. Also express it in polar form.	BL3	CLO4	20
