SHRI RAMSWAROOP MEMORIAL UNIVERSITY
End Semester Examination (2021-22)-Odd Semester

B.Sc.(IT) – I Year (I Sem)

Course Name:Basic Mathematics & Statistics	Code: BMA1007
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 sectionsandit is compulsory toattempt 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.	Without determining the roots, comment on the nature of roots of the equation $$x^2 + 2x + 1 = 0$$	BL2	CLO1	02
2.	Define symmetric and skew symmetric matrix.	BL1	CLO2	02
3.	Evaluate $\begin{vmatrix} 1 & 2 & 3 \\ 1 & 3 & -5 \\ 1 & 2 & 9 \end{vmatrix}$	BL5	CLO2	02
4.	Evaluate $\lim_{x \to 4} \frac{x^3 - 64}{x - 4}$	BL5	CLO3	02
5.	Define mean, median and mode.	BL2	CLO4	02
	Section B: Short Answer Type Questions Attempt any 03out of 05 questions.	BL	CLO	Marks (30)
1.	If α and $\beta$are roots of the equation $2x^2 + 6x - 1 = 0$ then find the value of $\frac{1}{\alpha^2} + \frac{1}{\beta^2}$.	BL2	CLO1	10
2.	Discuss the continuity of function at x=0, if $$f(x) = \begin{cases} 3x - 2, & x \leq 0 \\ x + 1, & x > 0 \end{cases}$$	BL3	CLO2	10
3.	Differentiate $\frac{e^x - e^{-x}}{e^x + e^{-x}}$with respect to x.	BL5	CLO3	10
4.	Evaluate $\int \frac{\sec x}{(\sec x + \tan x)} dx$.	BL5	CLO3	10
5.	If a, b, c are positive and unequal, show that the value of the determinant $\begin{vmatrix} a & b & c \\ b & c & a \\ c & a & b \end{vmatrix}$is negative.	BL4	CLO2	10

Section C: Long Answer Type Questions/Case Study Attempt any 01 out of 04 questions.	BL	CLO	Marks (20)
1. Using matrices, solve the following system of equations: $x - y + z = 4; \quad x - 2y - 2z = 9; \quad 2x + y + 3z = 1$.	BL5	CLO2	20
2. Find the value of x, if $[1 \quad x \quad 1] \begin{bmatrix} 1 & 3 & 2 \\ 2 & 5 & 1 \\ 15 & 3 & 2 \end{bmatrix} \begin{bmatrix} 1 \\ 2 \\ x \end{bmatrix} = 0$	BL4	CLO2	20
3. Prove that $\int_0^{\pi/2} log(sinx)dx = -\frac{\pi}{2}(\log 2)$	BL5	CLO3	20
4. Obtain first, second and third quartile for the data: 5, 6, 8, 9, 10,11, 15	BL3	CLO4	20