GALGOTIAS UNIVERSITY

ADMISSION NUMBER												

School of Basic Sciences

Bachelor of Science Honours in Mathematics
Mid Term Examination - Nov 2023

Duration : 90 Minutes
Max Marks : 50

Sem I - C1UC101T - Algebra

General Instructions
Answer to the specific question asked
Draw neat, labelled diagrams wherever necessary
Approved data hand books are allowed subject to verification by the Invigilator

1)	Explain One-to-one correspondence of a function.	K2	(2)
2)	Find whether the given relation on set A is reflexive, symmetric, transitive or not. Let A = {1, 2, 3, 4} R_1 = {(1, 1), (2, 2), (3, 3), (4, 4), (1, 2), (2, 1), (2, 3), (3, 2), R_2= {(1, 1), (2, 2), (3, 3), (4, 4), (1, 2), (2, 1), (2, 3), (3, 2)}.	K1	(3)
3)	Estimate the number that should be added to x^2+5 so that the resulting polynomial leaves the remainder 3 when divided by $x+3$?	K2	(4)
4)	Show that the relation of equality on integers is an equivalence relation	K2	(6)
5)	Use the Division Algorithm to establish the following: The fourth power of any integer is either of the form 5k or 5k + 1.	K3	(6)
6)	Prove that a map f is invertible iff it is one-one onto.	K3	(9)
7)	Use the Division Algorithm to establish the following: The square of any integer is either of the form 3k or 3k +1	K4	(8)
8)	Examine the validity of the statement: For any integer a, $a^3 \equiv 0,1$, or 8 (mod 9)	K4	(12)
	OR		
	Examine the validity of the following statement: If a /(b +c), then either a /b or a/c	K4	(12)