GALGOTIAS UNIVERSITY

ADMISSION NUMBER												

School of University Polytechnic

Diploma in Civil Engineering

Summer Term Examination – July - August 2024

Duration : 180 Minutes
Max Marks : 100

Sem II - N1DF201T- MATD1011 - Applied Mathematics II

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)	Find the derivative log sin x with respect to x.	K1	(2)
2)	Show that $\left(\frac{-1+i\sqrt{3}}{2}\right)^3 = 1$	K2	(4)
3)	Show that $f(\theta) = \sin\theta$, is increasing in the interval $\left(0, \frac{\pi}{2}\right)$	K2	(6)
4)	Identify $\frac{dy}{dx}$, when: y= (sin $^{-1}$ x) ^{x} .	K3	(9)
5)	If a = cos α + i sin α, b = cos β + i sin β and c = cos γ + i sin γ find the value of $\frac{ab}{c}$.	K3	(9)
6)	Evaluate If $x + \frac{1}{x} = 2cos\theta$, Prove that $x^n + \frac{1}{x^n} = 2cosn\theta$.	K5	(10)
7)	Simplify: $\int_0^1 \sin^{-1}\left(\frac{2x}{1+x^2}\right) dx$	K4	(12)
8)	Evaluate If log y = tan^{-1} x, prove that (1 + x ^{2}) y $_{2}$ + (2x - 1)y $_{1}$ = 0	K5	(15)
9)	Evaluate $z^7 + 1 = 0$, z is a complex number.	K5	(15)
10)	Solve the If y =$e^{m\sin^{-1}x}$, then show that $(1-x^2)\frac{d^2y}{dx^2} - x\frac{dy}{dx} - m^2y = 0$	K6	(18)