UNIVERSITY OF MINES AND TECHNOLOGY, TARKWA

SECOND SEMESTER EXAMINATIONS, MAY 2018

COURSE NO: EL 382
COURSE NAME: MICROPROCESSORS AND DIGITAL CONTROL SYSTEMS
CLASS: EL III **TIME**: 3 HOURS

Name**:** _____Index Number: _____

Some commonly used z-transformations

SN.	$f(t=kT)$	$F(z)$	$F(s)$
1.	$\delta(kT)$	1	1
2.	1	$\frac{z}{z-1}$	$\frac{1}{s}$
3.	kT	$\frac{Tz}{(z-1)^2}$	$\frac{1}{s^2}$
4.	e^{-akT}	$\frac{z}{z-e^{-aT}}$	$\frac{1}{s+a}$
5.	kTe^{-akT}	$\frac{Tze^{-aT}}{\left(z-e^{-aT}\right)^2}$	$\frac{1}{(s+a)^2}$
6.	$1-e^{-akT}$	$\frac{z(1-e^{-aT})}{(z-1)\left(z-e^{-aT}\right)}$	$\frac{a}{s(s+a)}$
7.	$\sin \omega kT$	$\frac{z\sin\omega T}{z^2-2z\cos\omega T+1}$	$\frac{\omega}{s^2+\omega^2}$
8.	$\cos \omega kT$	$\frac{z(z-\cos\omega T)}{z^2-2z\cos\omega T+1}$	$\frac{s}{s^2+\omega^2}$
9.	$e^{-akT}\sin \omega kT$	$\frac{ze^{-aT}\sin\omega T}{z^2-2ze^{-aT}\cos\omega T+e^{-2aT}}$	$\frac{\omega}{(s+a)^2+\omega^2}$
10.	$e^{-akT}\cos \omega kT$	$\frac{z^2-ze^{-aT}\cos\omega T}{z^2-2ze^{-aT}\cos\omega T+e^{-2aT}}$	$\frac{s+a}{(s+a)^2+\omega^2}$
11.	$\delta(t-kT)$	z^{-k}	e^{-kTs}

- **Initial Value Theorem** $f(0)=\lim_{z\to\infty}F(z)$
- **Final Value Theorem** $f(\infty)=\lim_{z\to 1}\left[\frac{z-1}{z}F(z)\right]$