Name _____ Mailbox _____

ECE-320,

Quiz #6

For all of the following problems, assume we are using a two-sided z-transform.

1) The z-transform of a sequence $x(n)$ is defined as

a) $X(z) = \sum_{k=-\infty}^{\infty} x(n) z^{n}$ b) $X(z) = \sum_{k=-\infty}^{\infty} x(n) z^{-n}$

2) The z-transform of the sequence $x(n) = 3^{n} u(n)$ is

a) $\dfrac{z}{3-z}$ b) $\dfrac{1}{z-3}$ c) $\dfrac{1}{3-z}$ d) $\dfrac{z}{z-3}$ e) none of these

3) The z-transform of $x(n) = u(n)$ is

a) $\dfrac{z}{z-1}$ b) $\dfrac{1}{z-1}$ c) $\dfrac{1}{1-z}$ d) $\dfrac{z}{1-z}$ e) none of these

4) The z-transform of $x(n) = u(n-1)$ is

a) $\dfrac{z}{z-1}$ b) $\dfrac{1}{z-1}$ c) $\dfrac{1}{1-z}$ d) $\dfrac{z}{1-z}$ e) none of these

5) The z-transform of the sequence $x(n) = \delta(n)$ is

a) 1   b) z c) z^{-1} d) 0   e) none of these

6) The z-transform of the sequence $x(n) = \delta(n-1)$ is

a) 1   b) z c) z^{-1} d) 0   e) none of these

7) The z-transform of the sequence $x(n) = 3^{n+1} u(n)$ is

a) $\dfrac{3z}{z-3}$ b) $\dfrac{1}{3}\dfrac{z}{z-3}$ c) $\dfrac{1}{3}\dfrac{z^{2}}{z-3}$ d) $\dfrac{3z^{2}}{z-3}$ e) none of these

1

8) The z-transform of the sequence $x(n) = 3^n u(n-1)$ is

a) $\dfrac{3}{z-3}$ b) $\dfrac{3z}{z-3}$ c) $\dfrac{9z}{z-3}$ d) $\dfrac{9}{z-3}$ e) none of these

9) The z-transform of the sequence $x(n) = 3^n u(n+1)$ is

a) $\dfrac{3z^2}{z-3}$ b) $\dfrac{1}{3}\dfrac{z}{z-3}$ c) $\dfrac{1}{9}\dfrac{z^2}{z-3}$ d) $\dfrac{1}{3}\dfrac{z^2}{z-3}$ e) none of these

10) The z-transform of the sequence $x(n) = 2^n u(n)$ converges provided

a) $2 < |z|$ b) $|z| < 2$

11) The z-transform of the sequence $x(n) = \left(\dfrac{1}{3}\right)^n u(n-1)$ converges provided

a) $\dfrac{1}{3} < |z|$ b) $|z| < \dfrac{1}{3}$

12) For z-transform $Y(z) = \dfrac{z^{-1}}{z-2}$, the inverse z-transform is

a) $y(n) = 2^n u(n)$ b) $y(n) = 2^{n-2} u(n-2)$ c) $y(n) = 2^{n+2} u(n+2)$ d) $y(n) = 2^{n-2} u(n)$ e) none of these

13) For z-transform $Y(z) = \dfrac{1}{z-2}$, the inverse z-transform is

a) $y(n) = \dfrac{1}{2}\delta(n) - \dfrac{1}{2} 2^n u(n)$ b) $y(n) = -\dfrac{1}{2}\delta(n) + \dfrac{1}{2} 2^n u(n)$