Name_____ **CM**_____

Quiz 3

(no calculators)

1) The **average power** in the signal $x(t) = ce^{j\omega_0 t}$ is

a) 0 b) $\frac{|c|}{2}$ c) $|c|^2$ d) $\frac{|c|^2}{2}$

2) The **average power** in the signal $x(t) = A\cos(\omega_0 t + \theta)$ is

a) $\frac{|A|}{2}$ b) $|A|$ c) A^2 d) $\frac{A^2}{2}$

3) The **average power** in the signal $x(t) = ce^{j\omega_0 t} + de^{j2\omega_0 t}$ is

a) 0 b) $\frac{|c|}{2} + \frac{|d|}{2}$ c) $|c|^2 + |d|^2$ d) $\frac{|c|^2}{2} + \frac{|d|^2}{2}$

4) The **average power** in the signal $x(t) = A\cos(\omega_0 t + \theta) + B\cos(2\omega_0 t + \phi)$ is

a) $\frac{|A|}{2} + \frac{|B|}{2}$ b) $|A| + |B|$ c) $A^2 + B^2$ d) $\frac{A^2}{2} + \frac{B^2}{2}$

5) The signal $x(t) = e^{j\omega_0 t}[u(t) - u(t-100)]$ is

a) an energy signal b) a power signal c) neither energy or power

6) The signal $x(t) = t$ is

a) an energy signal b) a power signal c) neither energy or power

7) The integral $h(t) = \int_{-\infty}^{t-3} e^{-(t-\lambda)}\delta(\lambda+3)d\lambda$ can be simplified as

a) $e^{-(t+3)}u(t)$ b) $e^{-(t+3)}u(t+1)$ c) $e^{-(t+3)}u(t+3)$ d) $e^{-(t+3)}u(t+4)$

8) The integral $h(t) = \int_{-\infty}^{t} e^{-(t-\lambda)}\delta(\lambda - 1)d\lambda$ can be simplified as

a) $e^{-(t-1)}u(t)$ b) $e^{-(t-1)}u(t-1)$ c) $e^{-(t-1)}u(t-3)$ d) $e^{-(t-1)}u(t-4)$

9) If $z_1 = \frac{j}{1+j}$ and $z_2 = \frac{1}{1+j}$, then the **magnitude** of $z = z_1 z_2$, $|z|$, is equal to

a) $\frac{1}{\sqrt{2}}$ b) $\frac{1}{2}$ c) 1 d) none of these

10) If $z_1 = \frac{j}{1+j}$ and $z_2 = \frac{1}{1+j}$, then the **phase** of $z = z_1 z_2$, $\angle z$, is equal to

a) 0^o b) 45^o c) -45^o d) 135^o e) -135^o f) none of these

Fill in the following table with a Y (yes) or N (no) for each of the system models given. Assume $-\infty < t < \infty$ for all of the systems.

System	System Model	Linear?	Time-Invariant?	Causal?	Memoryless?
11	$y(t) = 3e^{t+1}x(t)$				
12	$y(t) = x\left(\frac{t}{2}\right)$				
13	$y(t) = \frac{1}{2}\left[x(t-1) + x(t+1)\right]$				
14	$\dot{y}(t) + y(t) = x(t) + 2$				
15	$y(t) = \int_{0}^{t} e^{-(t-\lambda)}x(\lambda + 1)d\lambda$				