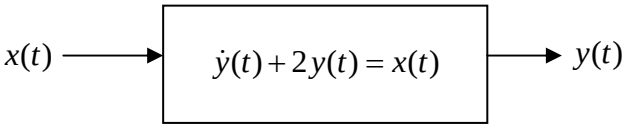
Name _____ CM_____

ECE-300, Quiz #4

Problems 1 and 2 refer to the following system:



1) The impulse response for this system (which is assumed to be initially at rest) is

a) $h(t)=e^{-2t}u(t)$ b) $h(t)=e^{t^2}u(t)$ c) $h(t)=2e^{-t}u(t)$ d) $h(t)=e^{-t^2}u(t)$

2) Is this system linear? a) Yes b) No

3) We can write $e^{jk\pi}$ as a) 1 b) $(-1)^k$ c) 0

4) We can write j as a) $e^{j\pi}$ b) $e^{-j\pi}$ c) $e^{j\frac{\pi}{2}}$ d) $e^{-j\frac{\pi}{2}}$

5) We can write -1 as (circle all that apply) a) $e^{j\pi}$ b) $e^{-j\pi}$ c) $e^{j\frac{\pi}{2}}$ d) $e^{-j\frac{\pi}{2}}$

6) We can write $\cos(\theta)$ as

a) $\frac{e^{j\theta}-e^{-j\theta}}{2}$ b) $\frac{e^{j\theta}-e^{-j\theta}}{2j}$ c) $\frac{e^{j\theta}+e^{-j\theta}}{2j}$ d) $\frac{e^{j\theta}+e^{-j\theta}}{2}$

7) We can write $\sin(\theta)$ as

a) $\frac{e^{j\theta}-e^{-j\theta}}{2}$ b) $\frac{e^{j\theta}-e^{-j\theta}}{2j}$ c) $\frac{e^{j\theta}+e^{-j\theta}}{2j}$ d) $\frac{e^{j\theta}+e^{-j\theta}}{2}$

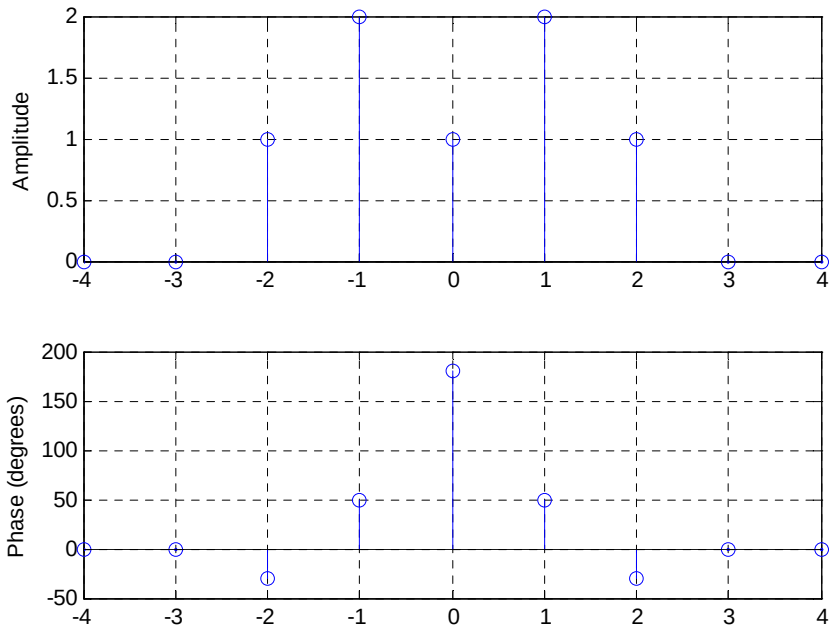
8) Assume we are going to synthesize a periodic signal $x(t)$ using $x(t)=\sum c_k e^{jk\omega_0 t}$ where $c_k=\frac{j}{1+k^2}$. Will $x(t)$ be a real function?

a) Yes b) No

9) Assume we are going to synthesize a periodic signal $x(t)$ using $x(t) = \sum c_k e^{jk\omega_0 t}$ where $c_k = \dfrac{jk}{1+jk}$. Will $x(t)$ be a real function?

a) Yes b) No

Problems 10, 11, and 12 refer to the following plot



10) Is this a valid spectrum plot for a real valued function $x(t)$?

a) Yes b) No

11) Assuming the magnitude portion of the spectrum is correct, what is the average power in $x(t)$?

a) 4 b) 7 c) 11 d) 12

12) Assuming the plot is a valid spectrum plot for a real valued function $x(t)$, the average value of $x(t)$ is

a) 1 b) 2 c) $\dfrac{7}{4}$ d) -1