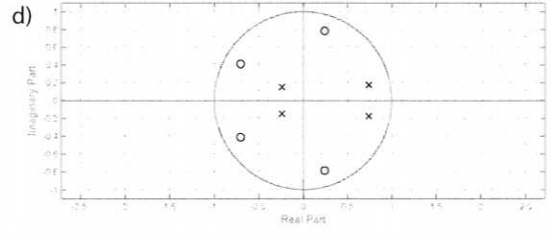
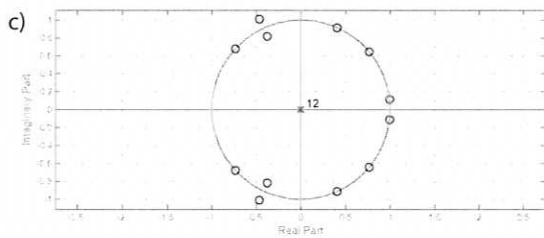
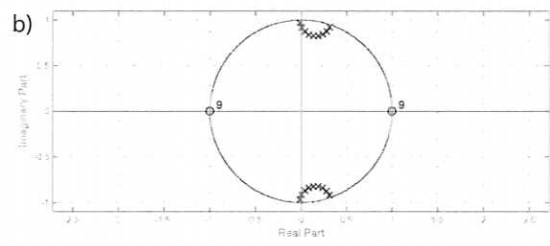
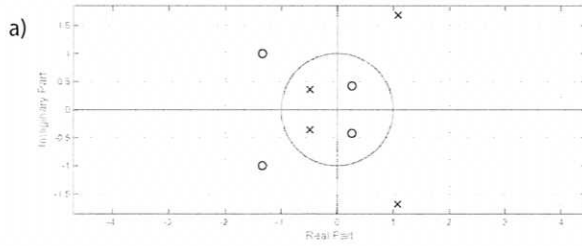


ECEn 487 - Introduction to Digital Signal Processing

Winter 2013

Quiz 5

1. I have the following pole-zero diagrams for four different filters. *(causal, LTI)*



I) (1 pt) Which filters are stable?

B, C, D

II) (1 pt) Which filters are FIR?

C

III) (1 pt) Which filters are minimum-phase?

D

IV) (1 pt) Which filters are generalized linear-phase?

C

V) (2 pts) Indicate for each filter if it is all-pass, low-pass, high-pass, or band-pass.

- a) *All-pass*
- b) *Band-pass*
- c) *High-pass*
- d) *Low-pass*

2. (2 pts) Suppose you have a sequence $\tilde{x}[n]$, which is periodic with a period of $N = 10$. What is the resulting sequence $\tilde{x}[n - 10] + \tilde{x}[n + 20]$?

$$2\tilde{x}[n]$$

3. (2 pts) Suppose I have sequences $\tilde{x}[n]$ and $\tilde{y}[n]$ that are periodic with a period of 7. If I find the discrete Fourier Series for each of these, $\tilde{X}[k]$ and $\tilde{Y}[k]$, respectively, then what is the resulting sequence, $\tilde{z}[n]$, if $\tilde{Z}[k] = 2\tilde{X}[k] - 3\tilde{Y}[k]$.

$$\tilde{z}[n] = 2\tilde{x}[n] - 3\tilde{y}[n]$$