# 6.1

Determine the impulse response of each of the systems in Figure 6-1.

1

-2

4

3

-1

1

1

-1

3

4

-2

1

2

3

-1

1

1

2

-1

3

Figure 6-1

# 6.2

Let and be *N*-point sequences () related by the following difference equation:

Draw a direct from II signal flow graph for the causal LTI system corresponding to this difference equation.

# 6.3

Consider the signal flow graph shown in Figure 6-2.

1. Using the node variables indicated, write the set of difference equations represented by this network.
2. Draw the flow graph of an equivalent system that is the cascade of two first-order systems.
3. Is this system stable? Explain.

2

0.99

Figure 6-2

# 6.4

Consider the system in Figure 6-3.

2

Figure 6-3

1. Find the system function relating the z-transforms of the input and output.
2. Write the difference equation that is satisfied by the input sequence and the output sequence .
3. Draw a signal flow graph that has the same input-output relationship as the system in Figure 6-3, but that has the smallest possible number of delay elements.