You need to know the following topics in sections 5.5, 5.7 and Ch 6 for test 2 of DSP

1- Given the impulse response of the system $h[n]$ and the input $x[n]$ you should be able to find the zero-state response $y[n]$ using convolution definition and/or properties with the table.

2- Given the difference equation you should be able to determine if the system is stable or not.

3- Given a discrete signal $x[n]$ you should be able to find its DTFT $X(\Omega)$ using the definition (the summation).

4- Given the DTFT $X(\Omega)$, you should be able to find $x[n]$ using the definition (the integral).

5- You should be able to use the DTFT properties, the partial fraction expansion, and the tables to find the DTFT of $x[n]$ and the IDTFT of $X(\Omega)$.

6- If you carry out convolution or multiplications of two signals you should be able to determine if aliasing will happen in the resulted signal. You should be able to determine the minimum sampling rate to avoid aliasing.

7- Given a signal $x[n]$ or $X(\Omega)$ you should be able to calculate its Energy.

8- Given the difference equation of a system you should be able to find the system's frequency response $H(\Omega)$.

9- Given $H(\Omega)$ and $x[n]$ you should be able to find the zero-state response $y[n]$.

10- Given $H(\Omega)$ and the special everlasting inputs $A\cos(\Omega_o n)$ or the exponential $Ae^{j\Omega_o n}$, you should be able to find the system output easly.

11- Given the equation or the graph of $X(\Omega)$ you should be able to find the spectrum $X_{\downarrow}(\Omega)$ of the down sampled signal $x_{\downarrow}[n]$, and the cutoff frequency of the decimation filter to prevent aliasing.

12- Given the equation or the graph of $X(\Omega)$ you should be able to find the spectrum $X_{\uparrow}(\Omega)$ of the up sampled signal $x_{\uparrow}[n]$, and the cutoff frequency of the interpolation filter to prevent aliasing.