EECS202000 Signals and Systems
Homework #3

(Due November 3, 2021 before noon. Please submit in PDF format to the course website.)

Note: Detailed derivations are required to obtain a full score for each problem. (Total 100%)

1. (6%+6%+6%) Problem 3.48 (d), (e), and (g) of the textbook.

2. (4%+6%+8%) Problem 3.58 (a), (b), and (c) with $x[n] = \cos \frac{\pi n}{4}$ of the textbook.

3. (6%+6%+6%) Problem 3.60 (c) with $y[n] = 4^n u[-n+1]$, (f) as is, and (g) with $x[n] = \sin(\pi n/3)$ of the textbook.

4. (4%+4%+4%+6%) Problem 3.61 of the textbook.

5. (10%) Problem 3.63 of the textbook with $x(t) = \sum_{k=-\infty}^{\infty} \alpha^{2|k|} e^{jk\frac{\pi}{6}t}$.

6. (6%+6%+6%) Find the Fourier transform or the inverse Fourier transform of the following signals:

(a) $x(t) = e^{-3t}u(t)\sin 2\pi t$

(b) $x(t) = \begin{cases} 1-2t^2, & |t| \le 1/2, \\ 0, & \text{otherwise.} \end{cases}$

(c) $X(j\omega) = \begin{cases} 2, & 0 \le \omega \le 4, \\ -2, & -2 \le \omega < 0, \\ 0, & \text{otherwise.} \end{cases}$