

**University of Portland**  
**School of Engineering**

EE 262  
Spring 2018  
A. Inan

**Homework # 3—Convolution Integral & LTI Systems**

(Assigned: Wednesday, February 7, 2018)

(Due: Friday, February 16, 2018, 9:15a.m.)

These problems are assigned from Engineering Signals and Systems in Continuous and Discrete Time Second Edition by Ulaby/Yeagle (2016) (pages 79-84):

**2.10. Part (c). Graphical convolution.** (See pp. 44-45)

**2.12\*. Convolution integral.** (See Example 2-5 on pp. 47-48)

**2.14. Convolution integral.**

**Inan problem # 6: Compute the following convolutions using convolution tables.**

(a)  $y_1(t) = 2(t-1)u(t-3) * 3\delta(t-2)$ ;

(b)  $y_2(t) = [2u(t) - 3u(t-2)] * [2\delta(t-1) + 3\delta(t-3)]$ ;

(c)  $y_3(t) = [2u(t-1) - 2u(t-3)] * [3u(t-2) - 3u(t)]$ ;

(d)  $y_4(t) = 2u(t-1) * [4(t-2)u(t-2) - 3u(t-4)]$

**Inan problem # 7: Compute the following convolutions using convolution tables.**

(a)  $y_1(t) = [4\delta(t-2) - 3\delta(t-1)] * [5u(t-1) - 2u(t) - 3u(t-2)]$ ;

(b)  $y_2(t) = [4u(t-2) - 2t\delta(t-3)] * [3\delta(t-1) - 2(t-1)u(t)]$ ;

**2.17. Part (c). Convolution integral.**

**2.20\*. Cascaded LTI system.**

**2.22. Parts (a), (c), (e) & (f). BIBO stable and causal LTI systems.**

(See Section 2-6, pp. 57-60)

**2.23. Parts (a), (c) & (e). BIBO stable and causal LTI systems.**

**\*Optional.**

Please use the following guidelines for your homework solutions:

- 1) On the first sheet, at the top center, write: Homework #3-Solutions.
- 2) Provide your full name on the upper right corner of the first sheet.
- 3) Also write: EE 262/Spring 2018 on the upper left corner of the first sheet.
- 4) Solve each problem on a separate sheet unless your solution is very short.
- 5) Box all of your answers.
- 6) Staple your solutions in the above order before you turn them in.

Please turn in your homework on time.

**Happy Double Consecutive *e* Days!**  
**February 7, 2018 (2/7/18) & February 8, 2018 (2/8/18)**

$e \approx 2.7182818$