Assignment - 2

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***Abstract*—This document contains the solution to Exercise 2.34 (a) of Oppenheim.**

Problem 1. The input-output pair shown in fig-1 is given for a stable LTI system.

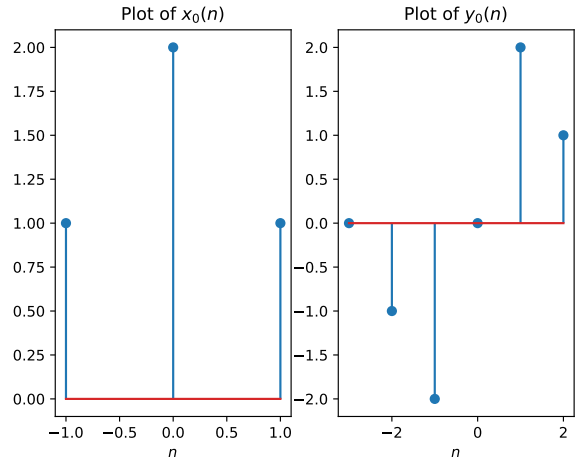

Fig. 1

Determine the response to input $x_1[n]$ in fig-2.

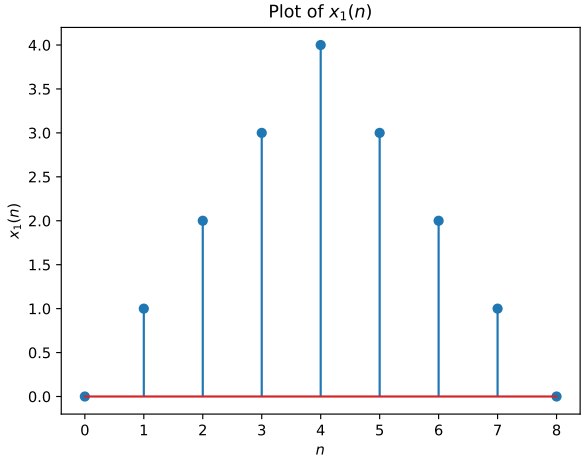

Fig. 2

Solution: We can notice that,

$$x[n] = x_0[n-2] + 2x_0[n-4] + x_0[n-6] \quad (1)$$

Since the system is LTI, it implies

$$y[n] = y_0[n-2] + 2y_0[n-4] + y_0[n-6] \quad (2)$$

The response to input $x_1[n]$ can be shown in fig-3.

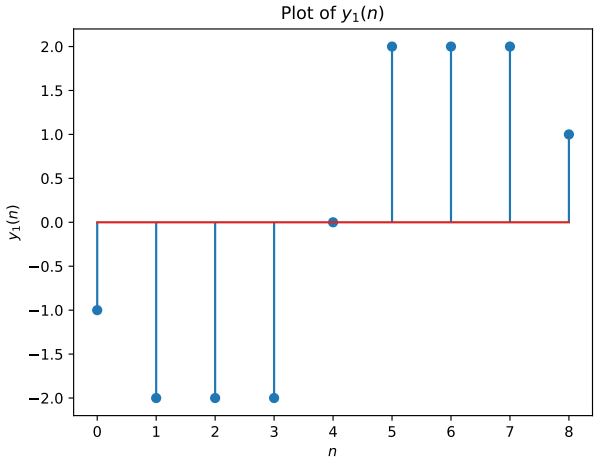

Fig. 3