Principles of Communication Systems
Columbia University
ELEN E3701
Spring Semester- 2008

Problem Set # 6

Problems Due: 11 March 2008

Problems # 1-6

Do the following problems from Haykin's Book

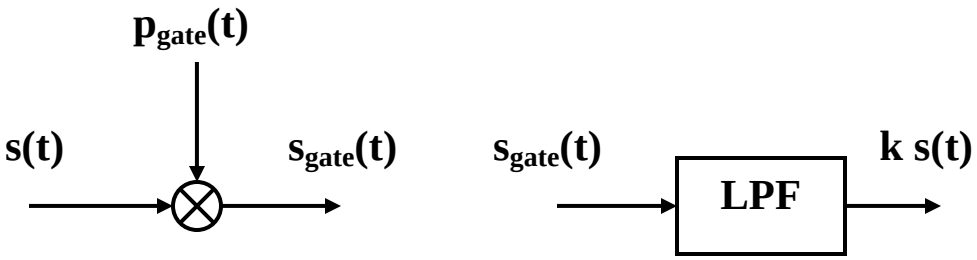
Problems 3.3, 3.5, 3.8, 3.10, 3.17 and 3.18

Problem #7

There is another PAM technique which is based on gating the signal, s(t), by multiplying the signal , s(t), by a periodic gating function, $p_{gate}(t)$ –See next page.

a. **Find the spectrum of the gated signal, $s_{gate}(t)$.**
b. **Draw the signal, $s_{gate}(t)$, in the time domain.**
c. **Can we recover s(t) exactly (except for a constant)? Explain.**
d. **What is the condition on the sampling frequency, f_s, in order to recover, s(t), at the receiver?**

Gated PAM



$$s_{gate}(t) = s(t)\, p_{gate}(t)$$