KFUPM - COMPUTER ENGINEERING DEPARTMENT

COE-341 – Data and Computer Communication

Assignment 2 – Due date: June 7th, 2009

Question 4.7 (5 points):

Question 4.9 (5 points):

Question 4.12 (5 points):

Problem (15 points) : Consider the wireless transmission media

a) (5 points) What is the ratio of received signal power to transmitted signal power (attenuation) in terms of the distance (d in meters - between the receive antenna and the transmit antenna) and the signal wavelength (λ in meters)? Assume the free-space path loss model.

b) (10 points) Show that doubling the transmission frequency OR doubling the distance between the transmitting antenna and receiving antenna attenuates the power received by 6 dB.

Problem (20 points): Consider the angle-modulated signal

$$s(t) = 10\cos\left(2\pi \times 10^6 t + 0.1\sin\left(\pi \times 10^3 t\right)\right)$$

1) Express s(t) as a PM signal with $n_p = 10$ (i.e. determine m(t))
2) Express s(t) as an FM signal with $n_f = 10\pi$ (i.e. determine m(t))

Question 5.6 (5 points):

Question 5.11 (5 points):

Problem 5.12 (20 points):

Problem 5.14 (20 points):

Problem 5.24 (bonus 20 points):

Problem 5.25 (bonus 20 points):

The total mark is 100 – There are 40 point bonus for problems 5.25 and 5.24.