KFUPM - COMPUTER ENGINEERING DEPARTMENT

COE-543 – Mobile Computing and Wireless Networks

Student Name:
Student Number:

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1) (20 points) on the path loss models

a) State the free-space path loss model – write the formula

b) In practice, the actual signal level is not always equal to the signal level computed by the path loss model. In fact the actual signal is 50% higher or 50% lower than the computed local mean following a normal distribution. What controls the local signal level? i.e. what controls how far does it swing around the local mean.

2) (20 points) On the subject of Small-scale fading and multipath channels

a) For small-scale fading or Rayleigh fading channels, the signal level typically follows a Rayleigh distribution. However, under some circumstances, the envelope distribution may follow the Rician distribution. State these circumstances and sketch typical plots for the Rician distribution.

b) Small-scale fading manifest itself in two mechanisms with respect to the transmitted signal. What are these mechanisms and briefly describe each of them.

c) What is a frequency selective channel and how is this related to the coherence bandwidth?