King Fahd University of Petroleum & Minerals

Department of Electrical Engineering

EE577 Wireless and Personal Communications

18 Minutes Quiz No.1 (April 3, 2006)

Student Name: Student Number

Problem 1.

When both antennas forming a mobile link are located at high points relative to the surroundings, which model would you use to calculate the propagation loss - (i) Hata Model, (ii) Free Space Loss Model, (iii) Plane Earth Loss Model. (Cross out inapplicable models). Give reasons why have you selected model.

Problem 2.

What range of values of propagation loss exponent, α i.e. loss is proportional to d^{α} is applicable to the indoor wireless system? Defend your answer.

Problem 3. *The mobile radio channel bandwidth is dependent on the signal bandwidth*. Discuss whether this is true or false, indicating what determines the channel bandwidth.

Problem 4. Define Frequency selectivity. What parameters determine the channel frequency selectivity?

Problem 5. The capacity of digital mobile system is limited by

(a) Co-channel interference
(b) Intersymbol interference
(c) Noise
(d) None of the above
(e) All of the above

In your opinion which of the above possible answer (a/b/c/d/e) apply and why?

Problem 6. The maximum data rate over a mobile channel is determined by

(a) Channel Delay Spread True or False
(b) Channel mean delay True or False
(c) Impulse response Length True or False
(d) Channel peak delay True or False

Defend your answer (s).

Problem 7.Channel Fading can be overcome by

(a) Increasing the gain of the receiver
(b) Transmitting higher power
(c) Implementing diversity
(d) Adaptive equalization
(e) All of the above.

Problem 8.
A researcher transmitted a long digital sequence over a channel with three distinct paths. The receiver finds the received signal to be full of inter-symbol-interference. The researcher raises the transmit power but it does not improve the performance. What steps he should take to improve the situation?

Problem 9.

For digital transmission, line codes (or the pulse shape) is selected on the basis of several attributes. Enumerate these attributes and give reasons why these attributes are important.