UNIVERSITY OF CALIFORNIA, LOS ANGELES

CS M117

Students Name \_\_Jingtao Wang 604439206 1D\_

**Bluetooth Communications**

Pre-laboratory HW #3 Due 04/20

(HW must be typed)

**Section A:**

1. (4) Wireless nets:

(a) What is the main similarity between a Wireless LAN and an Ad Hoc network

(b) What is the main difference?

(a) Wireless LAN and Ad Hoc connect devices wirelessly.

(b) In a wireless LAN call the devices communicate through one centralized access point. Devices do not communicate each other. In an Ad Hoc network, however, devices can connect directly with each other without the need for a centralized access point.

2. (4) Why is multihopping used in Ad-Hoc nets?

When multihopping is used, communication is carried out through a number of intermediate nodes (e.g. routers). Information is relayed from one node to the other until it reaches the end node. Using different hopping channels and different hopping sequences can prevent traffic and maximize the efficiency.

**Section B:**

**Bluetooth Communications**

**(T. Ch. 4. 310-317)**

1). (4) From Figure 1 shown bellow; we see that a Bluetooth device can be in two piconets at the same time.

Bridge slave

M

M

*Figure 1*

Is there any reason why one device cannot be the master in both of them

at the same time?

***Each piconet has a unique hopping pattern ID/sequence. It is determined by the device ID and clock that the master gives to slaves. If one device is the master of two piconets, it’s difficult for the master to control the clock and determined the communication for slaves in two piconets at the same time. The hopping pattern at the same time, might not be unique for each piconet. Furthermore, each master can connect to up to 7 simultaneous slaves. There will likely be more than 7 slaves in two piconets and the master cannot handle.***

2). (4) Figure 2 shows several physical layer protocols. Which of these is closest to the Bluetooth physical layer protocol?

**

Figure 2

What is the biggest difference between the two?

***Bluetooth uses FHSS, so it is closest to 802.11 FHSS layer. Bluetooth has a much higher hopping speed than 802.11 FHSS***

3). (4) Beacon frame in the frequency hopping spread spectrum variant of 802.11 contain the dwell time, Do you think the analogous beacon frame in Bluetooth also contain the dwell time? Discuss your answer.

No, the dwelling time is constant, 625