CS 3516 (A18) – Quiz 1 – Mon, August 27, 2018

Student Name: _____

WPI Username: _____

Please answer the following two questions using only the front side of this sheet of paper. **This quiz is closed book/notes. One page cheat-sheet is allowed**. *We will not grade the backside or any additional sheets of paper.* We will scan the quiz and return it electronically. To ensure it is properly scanned, please avoid wrinkling, folding, or otherwise distorting the paper. *You can use the back of the paper for any calculations you might have to perform.* (**7 points in total**.)

1. **Aren't Time Division Multiplexing (TDM) and packet switching the same thing? Why or why not? (4 points)**

No (1 point). They are different because in **TDM each communicating entity has a dedicated time slot** (1 point) available to it with a full bandwidth **irrespective of whether it has anything to send or not** (1 point)**.** However, in packet switching there **is no dedicated time slot for any communicating entity** (1 point). Whoever has data will get to send its packet, again using the full bandwidth.

2. **Consider a scenario with N users sharing a 200 Mbps link, where each user requires 50 Mbps when transmitting. Then:**
   a. **How many users can be supported under *circuit switching*? (2 points)**
   b. **Under *packet switching*, suppose that each user only needs to transmit 20% of the time. If N = 4 (u1, u2, u3, and u4), what is the probability that u1,u2,u3 are currently transmitting, while the u4 is not? (1 point)**

Please show the steps. Don't just write down the answers.

The number of users supported by circuit switching is given by **200 Mbps / 50 Mbps = 4**.
[TA note: 1 point for 200/50 and 1 point for 4]

The **probability** of any three of the users are currently transmitting, while the other one is not is given as 1 *** (0.2)^3 * (1-0.2) = 1 * 0.008 * 0.8 = 0.0064** = **0.64%**
[TA note: 1 points total, 0.5 points for solution, 0.5 point for correct answer]

[DO NOT DISTIRBUTE TO ANYONE]