Department of Computer Science and Engg, IIT Bombay
CS 348: Computer Networks Quiz1: 27th Aug 2012, 08:30 – 09:30
Handwritten notes permitted. No photocopies. Weightage: 10%, Max Marks – 30
Answer in the space provided below each question. Extra sheets will not be provided.

Write your Roll Number here: _____

Q1: You are working on your laptop connected to a 100 Mbps Ethernet LAN. You need a 2GB file that is on the server in the same LAN. The entire file is also on your pen drive but you have left the pen drive in another room. You have a dog, sitting beside you, that is trained to bring the pen drive to you. The average speed of the dog is 20 km/hour. Upto what distance does the dog have a higher data rate than 100 Mbps Ethernet? **(5 marks)**

(Hint: The dog should be able to go and bring the pen drive, before the transfer on the LAN completes. Assume continuous data transmission on the LAN (no packetization required).)

Q2: Consider packet sizes are 1000 bits, transmission rate is 1 Mbps, and propagation delay from source to destination is 15 milliseconds. Assume that acks are very small, processing time for packets and acks is negligible, and there are no errors in transmission. What will be the throughput if we use:

1. Stop-and-Wait ARQ. **(5 marks)**
2. Go-back-N ARQ, with a window size of 20 packets. **(5 marks)**

Write your Roll Number here: _____

Q3: Suppose we want to transmit the message 1011001001001011 and protect it from errors using the CRC8 polynomial $x^8 + x^2 + x^1 + 1$. Use polynomial long division to determine the message that should be transmitted. **(5 marks)**

Q4: In ALOHA protocol, a station transmits whenever it has data. In slotted-ALOHA, a station transmits only at the beginning of the next time slot. State one advantage of using slotted-ALOHA over ALOHA. State one drawback. **(5 marks)**

Q5: Your friend claims that the non-persistent CSMA protocol performs better than the 1-persistent CSMA protocol. Do you agree? If yes, justify your answer. If not, give a scenario for a counter-example. **(5 marks)**