

Last Name: \_\_\_\_\_, First Initial: \_\_\_\_\_

## CEN 5501C Computer Networks Examination 1

21 June 2007

### Instructions

1. Read all instructions. Failure to follow instructions will result in loss of points.
2. This is a closed-book examination.
3. You are permitted one 8.5 by 11 inch sheet of notes, both sides, that you have prepared.
4. You are permitted 80 minutes to complete this examination.
5. **Do not start** the exam until the proctor has told you to start.
6. **Answer the first question and any two (2) other questions, and no more.**
7. **Leave sufficient room in the upper lefthand corner for the staple** and staple your answer sheets in the room you have left.
8. Start the answer to each question on a new page (i.e., do **not** put the answer to more than one question on the same page).
9. Use exactly one page of paper (both sides is OK, or two pages front side only) to hold the answer to each question, and please write legibly.
10. Put the question number in the top center of each answer page and label each part of the question answer.
11. Show your work.
12. Include your last name and page number in the upper right hand corner of each answer page.
13. Assemble your answers in numerical order of the questions when you submit them.
14. Print your family name and first initial in the upper right hand corner of this page, and complete the honor statement affirmation below.

**Read and sign the following statement.** This page **MUST** be attached to your examination answers and **MUST** be completed to obtain credit for this examination.

On my honor, I have neither given nor received unauthorized aid on this examination.

Signed: \_\_\_\_\_

Printed Name: \_\_\_\_\_

UFID: \_\_\_\_\_ - \_\_\_\_\_

1. **Mandatory Question:** Recall Project 1.
  - a. What was the importance of the chunk header described in the project 1 description. What benefits if any you could have if you stored the header inside the chunks itself?
  - b. According to the project 1 specification, what do you think was not part of the server configuration file:
    - Server's IP Address
    - Server's Port Number
    - Number of Chunks
    - Chunk Size
    - Username
    - Shared Folder Absolute Path
    - Shared Folder Relative Path
    - None of the aboveYou may select more than one option for this question. No points will be awarded for partially correct answer
  - c. How did you implement connection timeout in your project?

**Selection Questions – Answer any two (2)**

2. Consider IEEE 802.3 LANs.
  - a. Why is there a minimum frame size and a maximum physical LAN diameter in IEEE 802.3?
  - b. What is the minimum frame size for 10 Mbps 802.3?
  - c. What problem occurs when the data rate increased to 100 Mbps, and how was this problem resolved in IEEE 802.3?
  - d. How was this problem resolved for gigabit Ethernet?
3. Consider a source and destination that are  $K$  hops apart, with each hop having a packet error rate of  $P$ . Derive and explain formulas for the following metrics.
  - a. What is the probability that a packet is sent successfully over all  $K$  hops without error correction on each link?
  - b. What is the expected cost for a transmission attempt? (Measure this in number of packet-hops, that is, one packet sent 3 hops costs 3 units.)
  - c. What is the expected number of attempts needed to deliver a packet successfully to the destination?
  - d. What is the expected total cost (in packet-hops) for successful packet delivery?
4. Consider hubs and bridges.
  - a. What is the difference between a learning hub and a learning bridge, if any?
  - b. What negotiations must an intelligent hub perform with the station on a port? When is half-duplex mode needed?
  - c. What are the two methods a hub can use to reduce the input rate on a port when it is overloaded?