Name: _____ (First name first)   **Score:** _____

COSC 6360   **QUIZ #3**   **JULY 27, 2009**

This exam is **closed book**. You can have **one page** of notes.

1. Consider a RAID level 5 array with seven data blocks (b_0 to b_6) and one parity block p per stripe.

    a) How much of the total disk space is used by **data blocks**? (10 **easy** points)   ___87.5___ percent

    (There are eight blocks per stripe and 7 of them hold data. Hence the ratio is 7/8 or 12.5 percent.)

    b) What is the best way to **update block** b_1 and its parity block p? (10 points)

    Fetch old values of blocks b_1 and p then compute new p = old b_1 XOR new b_1 XOR old p.

2. Consider a **two-ring** Totem system comprising two rings A and B. Assuming that a given processor has received messages with the following timestamps from each ring:

Rings	Messages
A	m(3h55), m(4h12)
B	m(3h50), m(4h15)

    Which messages will be delivered by the processor if all messages are **agreed delivery messages**? (10 points and no partial credit)

    The processor will deliver messages m(3h55) and m(4h12) _____ **from ring A**

    and messages m(3h50) _____ **from ring B.**

3. In Kerberos,

    a) Which key is used to encrypt the **authenticator** sent by the client to a given server S? (10 points)

    A session key $K_{c,s}$.

    b) Which Kerberos entity sends this key to the client? (10 points)

    The ticket granting service.

4. How does the tracker of a BitTorrent select the peers of a new downloader?   (20 points)

    Randomly.

5. What steps does **Sprite LFS** take to recover from a crash? (2×10 points)

    a) Sprite LFS first recovers the state of the file system at the time the last checkpoint was taken as it is the last known consistent state of the system.

    b) It then performs a <u>roll-forward</u> on the portion of the log recorded after the last checkpoint and updates all its data structures (including its i-node map) while ensuring that the file system always moves from one consistent state to another consistent state.