NAME: _____ (FIRST NAME FIRST)   **SCORE:** _____

COSC 6360   **QUIZ #4**   **APRIL 19, 2010**

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

1. **True or False** (4 points per correct answer)

   T __   F_✔ Sprite LFS stores its i-node map at a ***fixed location***.

   T _✔   F__ AFS/Coda servers do not trust their clients.

   T __   F_✔ RAID level 6 protects against triple disk failures.

   T __   F_✔ Coda is stateless.

   T __   F_✔ BSD-LFS assumes that the disk controller will ***never reorder*** write requests.

2. Consider a RAID level 5 array with nine data blocks (b_0 to b_8) and one parity block *p* per stripe.

   a) How much of the total disk space is used by ***data blocks***? (10 ***easy*** points)   __90___ percent

   b) What is the best way to ***update block*** b_8 and its parity block *p*? (10 points)

   Fetch old block b_8 and old p block; store new block b_8 and new p block _____

3. Which are the main advantage and the main disadvantage of using ***soft updates*** compared to using ***journaling with synchronous log updates***?

   a) ***Main advantage:*** (10 points)

   Soft updates are much faster than journaling with synchronous log updates.

   b) ***Main disadvantage:*** (10 points)

   Soft updates do not guarantee the durability of metadata updates.

4. When the ticket granting service of a Kerberos system replies to a client request, it sends an encrypted ticket for a given service and an encrypted session key $K_{c,s}$.

   a) ***How*** is this key encrypted? (10 points)

   With the user's secret key *Kc*.

   b) What will the client do with it? (10 points)

   It wil use it to encrypt its authenticators.

5. What are ***safe asynchronous writes***? (10 points) What is their ***main advantage***? (10 points)

   Safe asynchronous writes allow safe non-blocking writes at the server. When a client issues these writes, it keeps a local copy of all blocks it has sent to the server until they are properly committed to disk as the result of a COMMIT request it has issued.

   Safe asynchronous writes have a great impact on the performance on the server because they allow the server to batch multiple writes to the same block into a single disk write.