

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

1. Explain why RAID-3 systems do not experience the same *small write problem* as RAID-5 systems (10 points)
2. What is the function of the *i-map* of a *log-structured file system*? (5 points) Where is it stored? (3×5 points)
3. Which other file system architecture performs as well as *soft updates*? (5 points)
4. What characterizes a *stateless server*? (5 points) What are the main advantage and disadvantage of these servers? (2×5 points)
5. Why does *Farsite directory host* enforce directory integrity through a *Byzantine-fault-tolerant protocol*? (10 points)
6. What is the major motivation for adding non-volatile RAM to an NFS server? (5 points) Is there now a cheaper way to achieve almost the same performance improvement? (5 points)
7. What is the purpose of *file hoarding*? (5 points) Is a modern client likely to do *more* or *less* file hoarding than an older one? Why? (5 points)
8. What are the main advantage and disadvantage of *optimistic replication control* compared to *pessimistic replication control*? (10 points)
9. Explain how the original design of NFS emphasized *robustness* over *performance*? (10 points)