Practice Questions

Q1) Can deadlocks occur under the priority inheritance protocol? (Yes/No)

Q2) In dynamic binary translation, when does a dynamic basic block end? Short answer, please (e.g., "When a wormhole in encountered").

Q3) When an interrupt occurs during the execution of an emulated program, its delivery is often purposely delayed even though resources are available to deliver it immediately. What is the reason for delaying the delivery? Short answer, please (e.g., "Because the host might be in an undressed state").

Q4) Two independent compute-intensive tasks are executed on the same core. One has a period of 100ms and an execution time of 50ms. The other has a period of 30ms. If the task set is scheduled by EDF, what is the largest possible execution time that the second task can have (in ms) without causing either task to miss a deadline?

Q5) A disk head is at track 30, when requests for the following tracks are in the queue: 11, 40, 18, 41, 9, 60, 12, 20, 31. If shortest seek time first is used, in what order will these requests be served?

Q6) Repeat the above if C-Scan is used (serving requests in an increasing direction).

Q7) Sensitive instructions that are not privileged cause difficulties with emulation. Why? Short answer please (e.g., "Because they don't cause the light to turn on when the Hulk picks them up").

Q8) If disk blocks are 4KB long, and a file is just below 800KB. How many disk blocks need to be read in a pure linked allocation scheme to read the last byte of the file?

Q9) In the question above, assume that a pointer to a block is 4 bytes long and that indexed file allocation is used instead of linked allocation. How many disk blocks need to be read to read the last byte of the file?

Q10) Which of the following disk scheduling policy has a larger variance in request service times: SCAN or C-SCAN?

Q11) You created file A in directory X, then created a hard link to the file from directory Y. What operations need to be performed to delete the file (use actual UNIX commands)?

Q12) Given what we covered about the i-nodes in class, what is the maximum file size in UNIX if disk blocks were 1KB long and a pointer to a block was 4 bytes long?

Q13) In your opinion, why do we need dynamic binary translation? In other words, what's the main reason why we can't translate from guest to host entirely at compile time? Short answer please (e.g., "Because a compiler can't tell if the animal behind the fence is a cow or a bull")

Q14) When guest and host page sizes do not match, enforcing memory protection could be problematic. Which of the following has a more efficient solution: guest page size is multiple of host page size or host page size is multiple of guest page size?

Q15) When is interpretation more likely to perform better then dynamic binary translation? (Hint: short programs or long programs?)

Q16) Of the multi-level security schemes covered in class, which scheme is better-suited to preserve integrity of critical functions against contamination with bad inputs?

Q17) Of the multi-level security schemes covered in class, which scheme is better-suited to preserve confidentiality of secret data?

Q18) User A wants to send a private message that only user B can read. If public key cryptography is used, which key should A encrypt his/her message with? Short answer, please (e.g., "The Magic Key of A's boss").

Q19) User A wants to send a message that proves to B unequivocally who the sender is. If public key cryptography is used, which key should A encrypt his/her message with? Short answer, please (e.g., "A's Silver Key").

Q20) True or false: In the Google File System (GFS), a client who wants to read a file can retrieve the file from any chunk server that has a replica, but a client who wants to write to the file, must send the updated data blocks to the GFS *master* node. (True/False)
