1. a) No. User function executes instruction in user mode, while system call executes trap instruction to move a process into kernel mode so previleged operation can be executed

   b) No. If the both threads are reading shared variable, then concurrency error will not occur, and further more, concurrency error will not occur if only one of two threads are guarrenteed of updating the shared variable, and the other thread is reading the shared variable without importance of which ever state, before the update or after the update, it reads.

   c) No. Multiple threads under the same process share same code and data in heap memory. data in stack memory is not shared.

   d) No. The process of switching two processes process via `switch` system call occurs in kernel mode.

   e) No. External fragmentation occurs when there are holes in disk because the space cannot be filled by data blocks of a file

   f) No. Solid state drive focusing on putting close blocks together would result in a condition called wear out, and we want to avoid wear out as much as possible.

2. a) When CPU has resources to execute the thread in ready state

   Correct Solution

   Kernel dispatches the process

   b) A signal (e.g `pthread_cond_wait`)

   Correct Solution

   System call or signal that causes a process to be put from running state to blocked state

   c) An event signaling the thread to come back from blocked to running state (e.g `pthread_cond_signa`

   d)
   - Switching of mode flag from user mode to kernel mode
   - Saving of user registers to kernel stack

   Correct Solution

   Timer interrupt, system call

   e) This question is omittd. It is not covered in course yet.

   Notes

   - I need to review thread
   - I need to review system call in more detail (especially context switch)

3. This question is omittd. It is not covered in course yet.

4. a) 1.Three inodes are read (`root directory, cs, dw.txt`). With size of 128 bytes per inode, all inodes can fit into one inode block

   b) 2. One is for root directory and the other is for `cs`

   c) Minimum of 1 single indirect pointer. Inode stores 12 direct pointers to data blocks, 1 pointer to single indirect block, and 1 pointer to double indirect block, and 1 pointer to triple indirect block. It follows from the line `(13 * 4096) + 2048` that file `dw.txt` occupies at least 14 data blocks, and since first 12 will be pointed by direct pointer, the remaining 2 will be pointed by a single indrect pointer.

   d) 1. It is the data block that is being read.