Name: _____

Directions: **Work only on this sheet** (on both sides, if needed); do not turn in any supplementary sheets of paper. There is actually plenty of room for your answers, as long as you organize yourself BEFORE starting writing.

1. (20) List the various arrays from our book that are created by the OS. In each case, state whether the array is accessed by the hardware.

array name in book	hardware access?

2. Running the Linux **pstree** command displays "parents" and "children" of processes. Suppose we run the command on CSIF, and notice that there is a **gcc** process running.

(a) (15) The likely parent of that process is either _____ or _____ or _____ or ... (Fill in as many command names as appropriate; answer "none" if there is likely no parent.)

(b) (15) The likely child of that process is either _____ or _____ or _____ or ... (Fill in as many command names as appropriate; answer "none" if there is likely no child.)

3 (20) Consider the 11-line excerpt of Linux internal code on p.186, at the instant just before line 12 is executed. Suppose at that time, c(ESP) = 0x8000. What will be in memory location 0x8000 at that time?

4. Consider the threads example that begins on p.190.

(a) (15) For each of the following variables in the code, write either SAAT ("same address across threads") or DAAT ("different address across threads").

kb	
nthreads	
id[0]	

(b) (15) Suppose we run the program with the command

```
% hw /dev/pts/2 /dev/pts/5 /dev/pts/6
```

and we then type **ps axH** in another window. In the output of this latter command, we will likely see _____ entries for **hw**, _____ of which are in Run state, and _____ of which are in Sleep state.

Solutions:

1.

array	hardware access?
memory-allocation table	no
process table	no
page table	yes
interrupt vector table	yes

2a. tcsh, **make**

2b. cpp, **cc1**, **as**, **ld**

3. PC value of the process that we are about to resume (called **v** in the text)

4a.

kb	DAAT
nthreads	SAAT
id[0]	SAAT

4b. 4, 1, 3