

1. Using the program shown in following , explain what will be the output at Line A.

```
int value=8;
int main()
{
    pid_t pid;
    /* fork a child process */
    pid = fork();
    if (pid == 0) { /* child process */
        value +=15;
    }
    else { /* parent process */
        /* parent will wait for the child to complete */
        wait(NULL);
        printf(" Parent :value= %d\n",value);/* LINE A */
        exit(0);
    }
}
```

The final value is: ①

填空题 (20 分) 20 分 (请按题目中的空缺顺序依次填写答案)

8

正确答案:

① 8

Parent :value= 8

2. The program shown below uses the Pthreads API. What would be output from the program at LINE C and LINE P?

```
#include <pthread.h>
#include <stdio.h>
int value=0;
void *runner(void *param); /* the thread */
int main(int argc, char *argv[])
{
    int pid;
    pthread_t tid;
    pthread_attr_t attr;
    pid = fork();
    if (pid == 0) { /* child process */
        pthread_attr_init(&attr);
        pthread_create(&tid, &attr, runner, NULL);
        pthread_join(tid, NULL);
        printf("CHILD: value = %d", value); /* LINE C */
    }
    else if (pid > 0) { /* parent process */
        wait(NULL);
        printf("PARENT: value = %d", value); /* LINE P */
    }
}

void *runner(void *param) {
    value=10;
    pthread_exit(0);
}
```

Output at Line C ①

Output at Line P ②



填空题 (20 分) 20 分 (请按题目中的空缺顺序依次填写答案)

①

②

正确答案:

① 10

CHILD: value = 10

② 0

PARENT: value = 0

3. The context-switch time is OS overhead. The context-switch overhead depends on the following factors Except:

单选题 (10 分) 10分

- A. The complexity of the OS and PCB
- B. Number of Processes in Run Queue
- C. Multiple sets of registers per CPU
- D. Multiple contexts loaded at once

正确答案: B

4. When a process is first launched, the operating system does not know the size of this segment:

单选题 (10 分) 10分

- A. text
- B. data
- C. bss segment
- D. heap

正确答案: D

5. Similar to the process, the OS maintains a TCB (thread control block) for each thread. What information is stored in a thread control block (TCB)?

单选题 (10 分) 10分

- A. List of open files.
- B. Stack Pointer
- C. Memory Map
- D. Process ID

正确答案: B

6. Switching between user level threads of the same process is often more efficient than switching between kernel threads because:



单选题 (10 分) 10分

- A. User level threads require tracking less state.
- B. User level threads share the same memory address space.
- C. Mode switching is not necessary.
- D. Execution stays within the same process with user level threads

正确答案: C

7. Which of the following components of program state are shared across threads in a multithreaded process? (multiple choices)

多选题 (10 分) 10分

- A. Register values
- B. Heap Memory
- C. Global Variables
- D. Stack Memory

正确答案: B C

8. If all processes I/O bound, the ready queue will almost always be \_\_\_\_\_, and the Short term Scheduler will have a \_\_\_\_\_ to do.

单选题 (10 分) 10分

- A. full, little
- B. full, lot
- C. empty, little
- D. empty, lot

正确答案: C

