Department of Computing Sciences

CSCI 356 — Operating Systems
Homework Assignment #1-

Due: Thursday, September 07, 2017

Name: ID:

1. What are the components of any computer system? Briefly mention the role and the location of the operating system in the architecture.

2. Explain the Rio case study we discussed in class and how the operating system was utilized. What conclusions you draw from the study.

3. In batch systems, mention three different methods by which I/O functions were improved.

4. Answer the following regarding interrupts:
   a. In computer systems, what is the interrupt?
   b. Explain the difference between polling interrupts and the interrupts maintained in the interrupt vector table.
   c. Explain the interrupt handling process

5. Answer the following questions regarding processes:
   a. Define the "process".
   b. System call *fork()* is used to create processes. It takes no arguments and returns a process ID. Run the following code under UNIX (LINUX) environment and comment on the results:

```
#include  <stdio.h>
#include  <string.h>
#include  <sys/types.h>

#define   MAX_COUNT  200
#define   BUF_SIZE   100

void  main(void)
{
    pid_t  pid;
    int    i;
    char   buf[BUF_SIZE];

    fork();
    pid = getpid();
    for (i = 1; i <= MAX_COUNT; i++) {
        sprintf(buf, "This line is from pid %d, value =
%d\n", pid, i);
        write(1, buf, strlen(buf));
    }
}
```

6. What is the virtual address? Explain how virtual addresses are mapped into the physical memory.