

Solution Assignment # 01

Fall 2011

Marks: 20

Question # 1:

“Commonly it considered that degree of multiprogramming is affecting CPU utilization and always increase the CPU utilization.” In either case “yes” or “no”, justify the given statement with strong arguments. Write the answer in your own words.

CPU utilization increases as long as degree of multiprogramming up to a certain limit or CPU utilization reaches its maximum point. If the degree of multiprogramming keeps increasing, CPU utilization will decrement drastically and trashing will occur. To increase CPU utilization and stop trashing, we have to decrease the degree of multiprogramming then.

The CPU utilization if then given by the formula:

$$\text{CPU utilization} = 1 - p^n$$

Where p is a fraction p of its time waiting for I/O to complete and n is the number of processes in memory at once.

Question # 02:

```
#include <sys/types.h>
#include <stdlib.h>
#include <stdio.h>
void main(){
    int pid, status;
    pid_t child, beforeparent, afterparent;

    beforeparent = getpid();

    printf("\nProcess id for parent before fork() call:%d \n\n", beforeparent);
    pid = fork();
    if(pid == -1) {
        printf("fork() failed\n");
        //exit(1);
    }
    else {
        if(pid == 0){ /* Child */
            child = getpid();
            printf("I AM CHILD PROCESS: \n\n");
            printf("CHILD PROCESS ID: %d \n\n", child);
            exit(1);
        }
        else { /* Parent */
            wait(&status);
            afterparent = getpid();
            printf("I AM PARENT PROCESS : \n\n");
            printf("PARENT ID Before Fork() CALL: %d \n\n ", beforeparent);
            printf("PARENT ID After Fork() CALL: %d \n\n ", afterparent);
            exit(1);
        }
    }
}
```