Exercise session
(Processes)

Operating Systems – EDA092/DIT400

UNIVERSITY OF
GOTHENBURG

Question 1

Describe the actions taken by a kernel to context-switch between processes

Question 2

What is printed by this program?

```c
#include <stdio.h>
#include <sys/types.h>
#include <unistd.h>

#define SIZE 5

int nums[SIZE] = {0,1,2,3,4};

int main()
{
    int i;
    pid_t pid;
    pid = fork();
    if (pid == 0) {
        for (i = 0; i < SIZE; i++) {
            nums[i] *= -i;
            printf("CHILD %d\n",nums[i]);
        }
    }
    else if (pid > 0) {
        wait(NULL);
        for (i = 0; i < SIZE; i++)
            printf("PARENT: %d\n",nums[i]);
    }
    return 0;
}
```

Question 3

What is printed by this program?

```c
#include <stdio.h>
#include <sys/types.h>
#include <unistd.h>

int main()
{
    pid_t pid, pid1;
    pid = fork();
    if (pid < 0) {
        fprintf(stderr, "Fork Failed");
    }
    else if (pid == 0) {
        pid1 = getpid();
        printf("child: pid = %d", pid)
        printf("child: pid1 = %d", pid1)
    }
    else if (pid > 0) {
        pid1 = getpid();
        printf("parent: pid = %d", pid)
        printf("parent: pid1 = %d", pid1)
        wait(NULL);
    }
    return 0;
}
```

Question 4

Consider a multiprogrammed system with degree of 5. If each process spends 40% of its time waiting for I/O, what will be the CPU utilization?

Question 5

To use cache memory, the main memory is divided into cache lines, typically 32 or 64 bytes long. An entire cache line is cached at once. What is the advantage of caching an entire line instead of a single byte or word at a time?