

## Problem 5 of 8

# Signals

Consider the following C source code.

- **Assume all system calls succeed.**
- **Assume no other processes send signals.**
- Note that `getppid()` returns the parent PID.

```
#include "csapp.h"

static volatile pid_t pid;

static void sigint_handler(int sig) {
    Kill(pid, sig);
}

int main() {
    sigset_t empty, mask;
    Sigemptyset(&empty);
    Sigemptyset(&mask);
    Sigaddset(&mask, SIGINT);

    Sigprocmask(SIG_BLOCK, &mask, NULL); // REMOVED IN #2
    Signal(SIGINT, sigint_handler);

    pid = Fork();
    if (pid == 0) {
        pid = getppid();
        Kill(getpid(), SIGINT);
        Sigsuspend(&empty);
        printf("B");
        exit(0);
    }

    Kill(getpid(), SIGINT);
    Sigsuspend(&empty);
    printf("A");

    Waitpid(pid, NULL, 0);
    return 0;
}
```

## Question 1

The program is compiled and executed on a Shark machine.

1) Which of the following may happen? Select **all** possibilities.

- ☐ Program fails to compile
- ☐ Program hangs
- ☐ Program exits normally
- ☐ Program exits abnormally

2) Which of the following outputs may occur? Select **all** possibilities.

- ☐ (no output)
- ☐ A
- ☐ B
- ☐ AB
- ☐ BA

## Question 2

**The line marked // REMOVED IN #2 is now omitted.** The program is re-compiled and re-executed on a Shark machine.

**3)** Which of the following may happen? Select **all** possibilities.

- ☐ Program fails to compile
- ☐ Program hangs
- ☐ Program exits normally
- ☐ Program exits abnormally

**4)** Which of the following outputs may occur? Select **all** possibilities.

- ☐ (no output)
- ☐ A
- ☐ B
- ☐ AB
- ☐ BA