United International University
Course: Operating Systems (CSE 4509)
Class Test 1, Set B
Total Marks: 20, Time: 40 minutes

1) Consider the following two programs.

This is f1.c

```
1. int r1 = fork();
2.     if(r1 == 0)
3.     {
4.         printf("When you read, don't just consider what the author
   thinks, consider what you think\n");
5.         char *args[2];
6.         args[0] = strdup("./f2");
7.         args[1] = NULL;
8.         execvp(args[0], args);
9.         printf("We don't read and write poetry because it's cute.\n");
10.    }else
11.    {
12.        waitpid(r1, NULL, 0);
13.        int r2 = fork();
14.        if(r2 == 0)
15.        {
16.            printf("But there's nothing worse than regret.\n");
17.        }else
18.        {
19.            waitpid(r2, NULL, 0);
20.            printf("Truth is like a blanket that always leaves your
   feet cold!\n");
21.        }
22.    }
```

(1) (3) (4)

↳ this will not print

This is f2

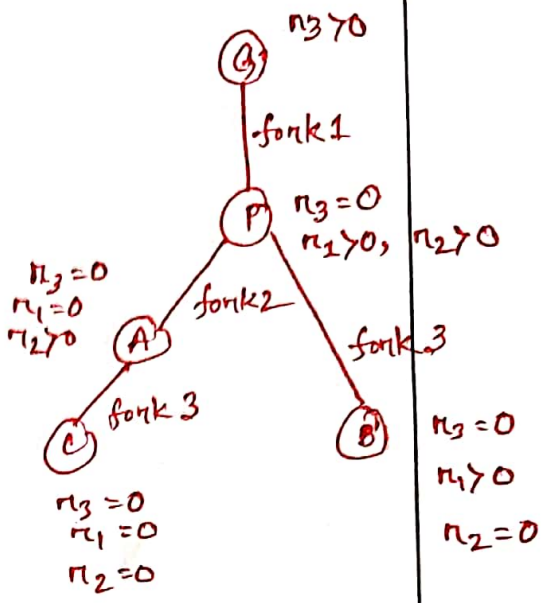
```
1. int main()
2. {
3.     printf("And you can fail, as long as you're trying hard\n");
4. }
```

(2)

What will be the output if we run f1.c? [6]

2) Consider the following program:

```
1.    int r3 = fork();
2.    if(r3 == 0) //child
3.    {
4.        int r1 = fork();
5.        int r2 = fork();
6.        if(r1 == 0 && r2 > 0)
7.        {
8.            waitpid(r2, NULL, 0);
9.            printf("Gohan\n");
10.       }
11.       else if(r1 > 0 && r2 == 0)
12.       {
13.           printf("Gotten\n");
14.       }
15.       else if(r1 ==0 && r2 == 0)
16.       {
17.           printf("Pan\n");
18.       }
19.       else
20.       {
21.           waitpid(r2, NULL, 0);
22.           waitpid(r1, NULL, 0);
23.           printf("Goku\n");
24.       }
25.   }else //parent
26.   {
27.       waitpid(r3, NULL, 0);
28.       printf("Bardock\n");
29.   }
```



Gotten/Pan
Gohan
Goku
Bardock

Pan
Gohan
Gotten
Goku
Bardock

a) Draw the process tree for the above program, showing the values of r1, r2 and r3 for each process (if the process has r1 or r2 or r3 variable's value) [6]

b) What will be the output of the program? [4]

3) What is the difference between the system calls: wait() and waitpid()? [4]