United International University
Course: Operating Systems (CSE 4509)
Class Test 1, Set A
Total Marks: 20, Time: 35 minutes

1) Draw the state diagram of a process, showing the transitions from one state to another. [5]

→ See class note

2) Consider the following two programs.

This is f1.c

```
int r1 = fork();
if(r1 == 0)
{
    printf("Hope is a good thing\n");
    char *args[2];
    args[0] = strdup("./f3");
    args[1] = NULL;
    execvp(args[0], args);
    printf("May be the best of things\n");

}else
{
    waitpid(r1, NULL, 0);
    printf("I will be hoping that this letter finds you, and finds you
well.\n");
}
```

This is f3

```
int main()
{
    printf("No good thing ever dies\n");
    return 0;
}
```

What will be the output if we run f1.c? [5]

Output: Hope is a good thing
No good thing ever dies
I will be hoping that this letter finds you;
and finds you well.

3) **Consider the following program:**

```
int r1 = fork();
int r2 = fork();
if(r1 == 0 && r2 > 0)
{
    waitpid(r2, NULL, 0);
    printf("Gohan\n");
}else if(r1 > 0 && r2 == 0)
{
    printf("Gotten\n");
}else if(r1 ==0 && r2 == 0)
{
    printf("Pan\n");
}
else
{
    waitpid(r2, NULL, 0);
    waitpid(r1, NULL, 0);
    printf("Goku\n");
}
```

a) **Draw the process tree for the above program, showing the values of r1 and r2 for each process. [6]**

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

3(a) → Same as the practice problem solved in class, provided in fork animation slide

3(b) →

Possible output 1

Pan
Gotten
Gohan
Goku

Possible output 2

Gotten
Pan
Gohan
Goku

এ ছাড়াও বিভিন্ন output হওয়া সম্ভব।