BRAC University, Dhaka
Department of Computer Science and Engineering

CSE321: Operating Systems, Spring 2024, Quiz - 1

Marks: 15 **Time: 20 Min**

Name:	ID:	Section:

1. Determine if the following sentences are true or false. For any false sentence, write its correct form. 5*1 = 5

   i. A bootloader program is stored inside ROM. (F)
   A bootstrap program is stored inside ROM.

   ii. A program is a passive entity. (T)

   iii. The short-term scheduler dictates the degree of multiprogramming. (F)
   LTS dictates the degree of multiprogramming.

   iv. A monolithic OS is easier to debug. (F)
   It is difficult to debug.

   v. A process state changes from *running* to *ready* because of an I/O operation. (F)
   Its state changes from running to waiting because of an I/O operation.

2. Fill in the blanks 4*1 = 4

   i. A process state changes from _new/running/waiting__ to ready

   ii. Mode bit is assigned a value of _1___ & __0____ for the user and kernel mode respectively.

   iii. Examples of two information stored in a PCB are _any two of: process state, PC, registers, scheduling information, memory management info, accounting info, I/O status info

   iv. A long term schedule resides in __a hard disk_____

3. Briefly answer the following questions. 3*2 = 6

   i. You have installed your favourite game in your system. Once installed, can we consider it as a program or process? What happens when we double click the game?
   Once installed, it is considered as a program. When we double click the program, it is transformed into a process by adding additional metadata as required to build the PCB and loaded into the memory to be executed by the CPU.

   ii. During execution, the installed game will need to access a few OS services. How can it access these services?
   By utilising the system call interface to execute the specific system call.

iii. Write the output for the following pseudocode:

```
int main()
{
   int x = 3;
   pid_t a = fork();
   if(a==0){
            x = x -1;
            printf("value of x is: %d", x);
   }
   else if (a>0){
     wait(NULL);
      x = x * 4;
      pid_t y = fork();
      if(y == 0) x = x + 2;
      printf("value of x is: %d", x);
   }
   return 0;
}
```

value of x is: 2value of x is: 12value of x is: 14

Sanitised output:

value of x is: 2

value of x is: 12

value of x is: 14