BRAC University, Dhaka
Department of Computer Science and Engineering

CSE321: Operating Systems
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 bootstrap program is stored inside RAM. (F)
   It is stored in the ROM
   ii. A process is an active entity. (T)
   iii. The short-term scheduler dictates the degree of multiprogramming. (F)
   The long-term scheduler dictates the degree of multiprogramming.
   iv. Cooperating processes do not affect each other. (F)
   Independent processes do not affect each other.
   v. A process state changes from *running* to *ready* because of an interrupt. (T)
2. Fill in the blanks 4*1 = 4
   i. The condition for a consumer to consume an item is:__the buffer must be non-empty____
   ii. Mode bit is assigned a value of ___1_____ & ___0_____ for the user and kernel mode respectively.
   iii. The PCB of a ~~state~~ process stores ____state information of a process__
   iv. Two advantages of shared memory are:____fast_____ & _____used for sharing large amount of data_____.
3. Briefly answer the following questions. 3*2 = 6
   i. Why do a producer and consumer need to be synchronised with each other?

   If a producer procures more than what a consumer can consume, the shared buffer will overflow. Alternatively, when the consumer tries to consume an empty shared buffer, it will cause an error.

   ii. Differentiate between a short-term and long-term scheduler.

   A short-term scheduler is stored in memory while a long-term scheduler is stored in the secondary memory. A short-term scheduler is executed much more frequently than a long term scheduler.

iii. Write the output for the following pseudocode:

```
int main()
{
   int x = 1;
   pid_t a = fork();

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

Output: value of x is: 4value of x is: 0value of x is: 2

Sanitised output:

value of x is: 4

value of x is: 0

value of x is: 2