National University of Computer & Emerging Sciences, Karachi

Fall-2018 CS-Department

Lab Final

Course Code: CL205	**Course Name: Operating Systems Lab**
Instructor Name: Sumaiyah Zahid	
Student Roll No:	**Section:**

"If there is something, you don't know today. You will surely learn afterwards. Life is not an exam hall."

BEST OF LUCK!

Instructions

- Rules are made to break them. So, invent yours and I'll break.

Time: 90 minutes **Max Marks:** 40 points

This program will create ____ child processes and ____ threads? (5 marks)

```
int main()
{
    printf("abc\n");
    fork();
    pthread_create(&tid, NULL, thread, NULL);
    pthread_create(&tid, NULL, thread, NULL);
    fork();
    fork();
    printf("xyz\n");
    pthread_create(&tid, NULL, thread, NULL);
    return 0;
}
```

Output

Output

```
int main() {
        printf("%d\n", getpid());
        a=fork();
        b=fork();
        if (b>0){
        printf("%d\n", getpid());
        fork();
        printf("%d\n", getpid());
        }
        printf("     Done!\n");
return 0;
}
```

Write appropriate system calls in the blanks **(5 marks)**

```
int main(void) {
        int fd, retval;
        char buffer[] = "TESTDATA";

        fflush(stdin);
        retval = _______________("/tmp/myfifo",0666);
        fd = _______________("/tmp/myfifo",O_WRONLY);
        write(____________,____________,sizeof(buffer));
        close(fd);
        return 0;
}
```

Advantage of FIFO over pipe is

a) related processes can communicate
b) unrelated processes can communicate
c) all of the mentioned
d) none of the mentioned

Which is true regarding pipes?

a) half duplex
b) full duplex
c) message boundaries are preserved
d) unordered data

What is the difference between the following commands? **(5 marks)**

```
module_param(answer, int, 0644);
module_param_named(mod7_intparam, answer, int, 0644);
```

____
____
____

Command for compiling module ________________________________
Command for module details ________________________________

What is the output on the terminal after compiling?

```
printk(KERN_INFO "Hey! \n");
printk(KERN_INFO "Final Paper of OS”);
printk("GoodBye");
return 0;
```

What is the difference between the two program? **(2 marks)**

pthread_t t[N];
for (i = 0; i < N; i++)
pthread_create(&t[i], NULL, thread_func, NULL);
for (i = 0; i < N; i++)
pthread_join(t[i], NULL);
	pthread_t t[N];
	for (i = 0; i < N; i++) {
	pthread_create(&t[i], NULL, thread_func, NULL);
	pthread_join(t[i], NULL);
	}

____
____
____
____

True or false: Code in an OpenMP program that is covered by a pragma is executed by all threads.
(1 marks)

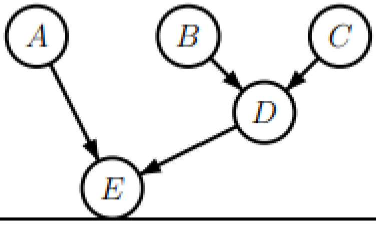
DevDay has 4 volunteers on their front desk.

- Volunteer 1 manages On day registration
- Volunteer 2 handles announcements
- Volunteer 3 handles sponsors
- Volunteer 4 resolve queries of participants

Implement this system using OpenMP for total 100 participants. Asuming 25 participants for each volunteer. **(5 marks)**

Write a sketch of a C program that uses Pthreads to execute the five functions in a way that is maximally parallel, but adheres to the above dependency graph.

The edge from node B to node D means that functionB must be called, and must return, before functionD can be called. **(2 marks)**



Write all possible output on executing the code below? (3 marks)

Output

```
sem_t mutex;
int i=0;
void* thread(void* arg)
{
   int a= * ((int*)arg);
   i++;
   printf("\nEntering..\n");
   sem_wait(&mutex);
   i++;
   printf("\n %d Entered..\n",a);
   printf(" Value of i is %d",i);
   sem_post(&mutex);
}
int main()
{
   sem_init(&mutex, 0, 1);
   pthread_t t1,t2;
   pthread_create(&t1,NULL,thread,&0);
   pthread_create(&t2,NULL,thread,&1);
   pthread_join(t1,NULL);
   pthread_join(t2,NULL);
   sem_destroy(&mutex);
   return 0; }
```

A certain bar is a well-known hangout for detectives. If a detective comes to the bar and there are no clients at the bar, the detective talks to the bartender. If one or more clients are present, the detective approaches the client who arrived earliest, and they leave the bar. If a client arrives and there are no detectives at the bar, the client orders a drink and waits. If there are one or more detectives, the client and the detective who arrived earliest leave the bar. What synchronization is necessary to ensure a correct system? **(5 marks)**

Write a code snippet which sets default behavior of ctrl+\, ignores ctrl+Z, assign funcA to ctrl+C.and func B to floating point error. (5 marks)

What is the output on executing the code below and pressing ctrl+Z 5 times? (2 marks)

```
int main(void)
{
            int i;
            signal(SIGSTP,  quit);
            signal(SIGKILL, quit);

            for (i = 1; i <= 20000000; i++)
            {
            }
}

void quit(int sig) {
            signal(sig, quit);
            cout<<”Ha Ha”;
}
```

Output