

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("OS\n");
    fork();
    fork();
    pthread_create(&tid, NULL, thread, NULL);
    fork();
    printf("OS\n");
    pthread_create(&tid, NULL, thread, NULL);
    pthread_create(&tid, NULL, thread, NULL);
    return 0;
}
```

Output

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

Output

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;  
}
```

. Which is true regarding pipes?

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

Which is Fastest IPC?

- a) Message Queue
- b) shared memory
- c) Socket
- d) All of the mentioned

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 adding module in kernel _____

Command for module details _____

What is the output on the terminal after compiling?

```
printk(KERN_INFO "Hello World. \n");  
printk(KERN_INFO "Final Paper of OS");  
printk("GoodBye");  
return 0;
```

In which pattern pthread_create and pthread_join can create a serial execution of threads and parallel. Illustrate by writing code for 3 threads.

(2 marks)

True or false: Code in an OpenMP program that is not covered by a pragma is executed by all threads. (1 marks)

A hospital has four persons on reception to give their services to patients.

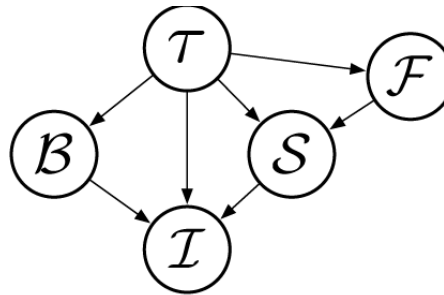
- Person 1 schedule appointments with doctors
- Person 2 handles fees submission
- Person 3 resolves Patients queries
- Person 4 resolves Doctors queries

Implement this system using pthread and OpenMP for 100 patients. Asuming 25 patients for each person. (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 T to node B means that function T must be called, and must return, before function B can be called.

(2 marks)



Write all possible output on executing the code below?

(3 marks)

```

sem_t mutex;
int i=0;
void* thread(void* arg)
{
    int a= *((int*)arg);
    i++;
    printf("%d\n",i);
    sem_wait(&mutex);
    printf("\n %d Entered..\n",a);
    sleep(4);
    printf("\nJust Exiting...\n");
    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; }
  
```

Output

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)**

Write output on executing the code below?

(2 marks)

```
int main(void)
{
    int i = 2700, j = 365;
    int x = 0;

    signal(SIGFPE, badprogram);
    cout << "Hello World" << endl;
    j = i / x;
    cout << "j = " << j << "\n";
    cout << "Good Bye" << endl;
    return 0;
}

void badprogram(int signumber)
{
    cout << "I am a bad program.." << endl;
    cout << "Very Bad" << endl;
    exit(1);
}
```

Output