

1. [6 pt] Enumerate two differences between interrupts and exceptions. Also give an example of each.
2. [8 pt] What are zombie processes in Unix? Can you kill them? What is the reason for their existence? What are the resources used by them?

3. [5 pt] What is the difference between a process and a daemon in Unix?

4. [5 pt] In `fork`, `join`, and `quit` primitives, we remarked that the `join` primitive is indivisible. Why is this such a requirement?

5. [10 pt] Does the following code satisfy critical section problem for two processes? Explain your answer.

```
extern bool flag[2] = {false, false}; // Shared with initialization as shown
extern int  turn = 0;                  // Shared with initialization as shown

process p ( const int i )              // i is 0 or 1 to identify process
{
    while ( 1 )
    {
        flag[i] = true;
        while ( flag[1-i] )
            if ( turn == 1-i )
            {
                flag[i] = false;
                while ( turn == 1-i );
                flag[i] = true;
            }

        critical_section ( i );

        turn = 1 - i;
        flag[i] = false;

        remainder_section ( i );
    }
}
```

6. [5 pt] What is the difference between monolithic kernel and microkernel architecture? Why does microkernel run slower compared to monolithic kernel? What kernel architecture is used in Unix, Linux, and Windows NT?
7. [4 pt] Give two examples (each) of applications in Unix that utilize synchronous and asynchronous messaging primitives.