

- 1) In the context of operating systems, what are the advantages and disadvantages of the layered approach to system design? What architectural changes may lead to improved performance?
- 2) Briefly describe the *states* in the process model, and show the transitions between these states (make a drawing). Describe an event that might cause one of such transitions.
- 3) Answer the following:
 - a. Multi-tasking enables more than one process to apparently execute simultaneously. How is this achieved on a single-processor computer?
 - b. Explain what happens when a *timer interrupt* occurs that eventually results in a *context switch* to another process?
- 4) List the resources (and attributes) used when a thread is created? How do they differ from those used when a process is created? Give the reasons for your answer.
- 5) A C program segment has the following code:

```
pid1=fork();  
pid2=fork();  
pid3=fork();  
...
```

Including the parent process (say P1), how many processes in total are there after all the fork() are executed? Numbering these as P2, P3 ..., show the parent-child relationship among these.