SEM234 *Operating Systems*
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# Mock Exam

1. (a) Describe the possible states of a process and the transitions between them.

   (b) A mono-processor system has several processes in the ready-queue. One process displays a rotating graphics on the screen, four processes perform a long compilation and finally there is an editing process in the queue. The graphics process needs the processor 75% of the time to run smoothly. Assume further that the compilation processes and the editors access different disks. Describe the effects of Round-Robin, Shortest-Job-First and priority scheduling on the response time of these processes.

   (c) Suppose that a scheduling algorithm favours those processes that have used the least processor time in the recent past. Why will this algorithm favour I/O-bound programs and yet not permanently starve CPU-bound programs?

2. (a) Does a page fault rate of 1% ensure a satisfactory memory access time? Justify your answer.

   (b) Consider a demand-paging system with the following time-measured utilisations:

| | |
|---|---|
| CPU-utilisation | 20% |
| Paging disc | 97% |
| Other I/O-devices | 5% |

   Which (if any) of the following will (probably) improve CPU-utilisation? Explain your answer.

   (i) Install a faster CPU.
   (ii) Install a bigger paging disk.
   (iii) Increase the degree of multiprogramming.
   (iv) Decrease the degree of multiprogramming.
   (v) Install more main memory.
   (vi) Install a faster hard disk, or multiple controllers with multiple hard disks.