SNS COLLEGE OF TECHNOLOGY

Kurumbapalayam (Po), Coimbatore – 641 107

An Autonomous Institution

Accredited by NBA – AICTE and Accredited by NAAC – UGC with 'A' Grade

Approved by AICTE, New Delhi & Affiliated to Anna University, Chennai

COURSE NAME : **23CST202-OPERATING SYSTEMS**

II YEAR / IV SEMESTER

Unit 1-OVERVIEW AND PROCESS MANAGEMENT

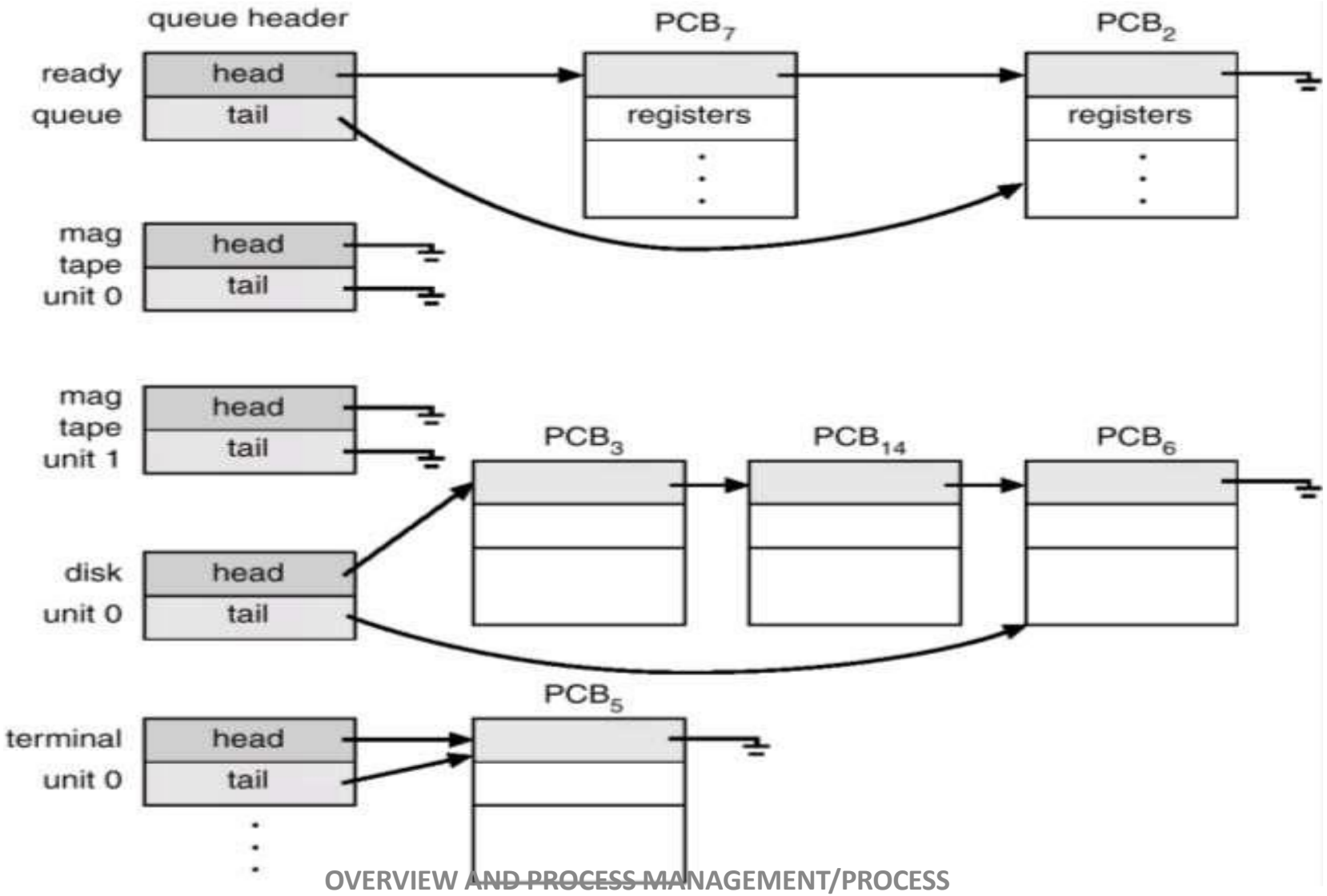
Topic : Process Scheduling

Process Scheduling Queues

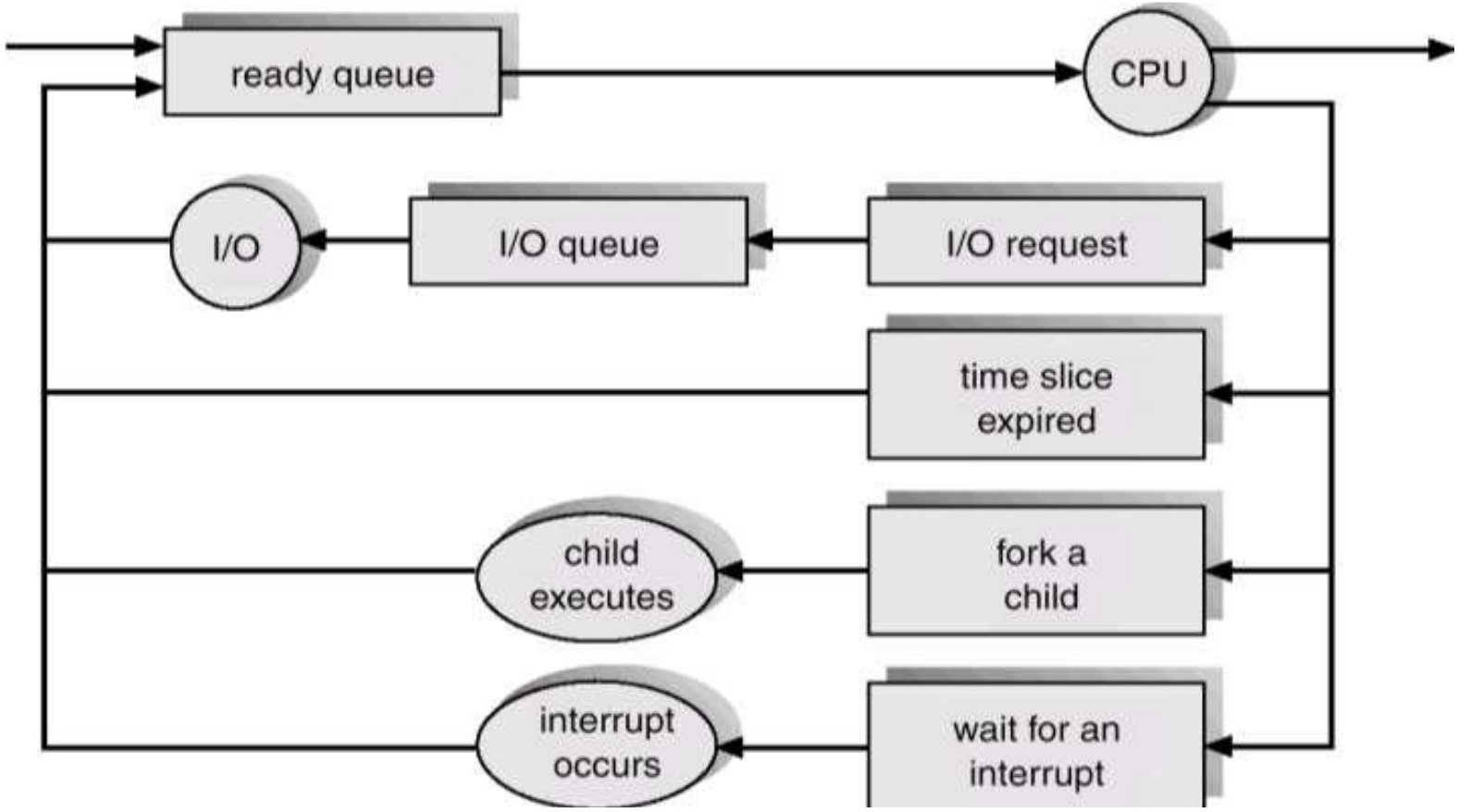
The objective is to try to keep the CPU as busy as possible for maximum CPU utilization & throughput –on a single CPU m/c only one process at a time can be allocated CPU

- Job queue –set of all processes in the system (even processes which are ready to run but are still in secondary memory)
- Ready queue –set of all processes residing in main memory, ready and waiting to execute ie waiting for CPU to be allocated
- Device queues –set of processes waiting for an I/O device to become free (as it may be busy with some other processes
- In the life time of the process, the process may go thru various queues

Ready Queue And Various I/O Device Queues



Representation of Process Scheduling

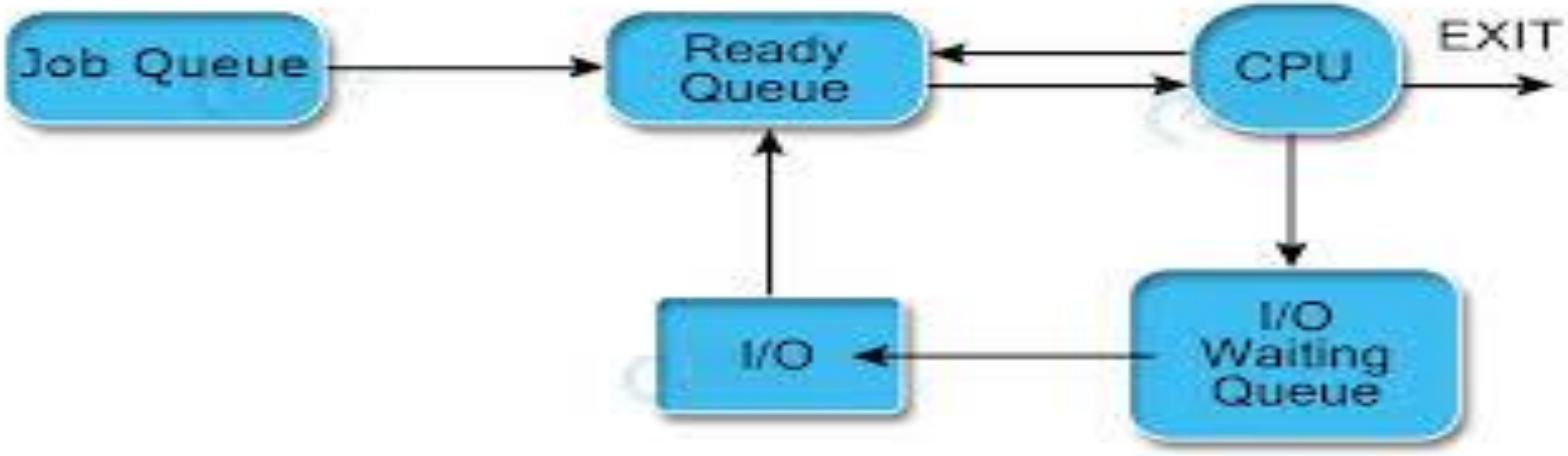


Note : The process could be removed forcibly from the CPU, as a result of an interrupt and put back in the ready queue.

- resources that serve the queue
- QUEUES

Schedulers

- ShortLong-term scheduler (or job scheduler) –selects which processes should be brought into the ready queue.
long-term scheduler (or CPU scheduler) –selects which process should be executed next and allocates CPU.

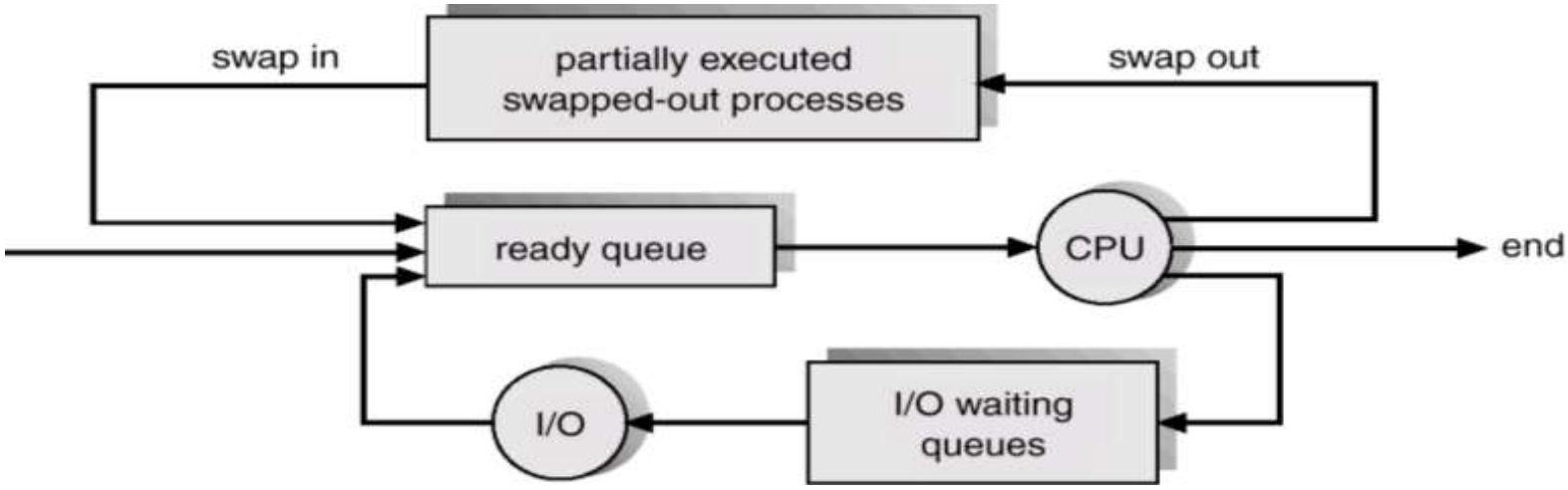


Schedulers (Cont.)

Short-term scheduler is invoked very frequently (milliseconds) so □(must be fast). →{ as the process will run for a short time (interactive) then i/o will occur or time slice will expire }

- Long-term scheduler is invoked very infrequently (seconds, minutes) □(may be slow).→{ as new process are not created so frequently }
- The long-term scheduler controls the *degree of multiprogramming.* →*The degree of multiprogramming is stable if the rate of creation of processes is equal to the rate of termination of the process so as to keep the multiprogramming stable. The long term scheduler should be invoked whenever some process terminates or leaves the system*
- **L.T.S**should select a good mix of i/o bound and CPU bound process so as to make efficient and optimal use of all the i/o devices and CPU
- Processes can be described as either:
  - ☞I/O-*bound process*–spends more time doing I/O than computations, many short CPU bursts.
  - ☞*CPU-bound process*–spends more time doing computations; few very long CPU bursts.

Addition of Medium Term Scheduling
(In time sharing system generally long term scheduler is absent and in place a medium term scheduler is used)



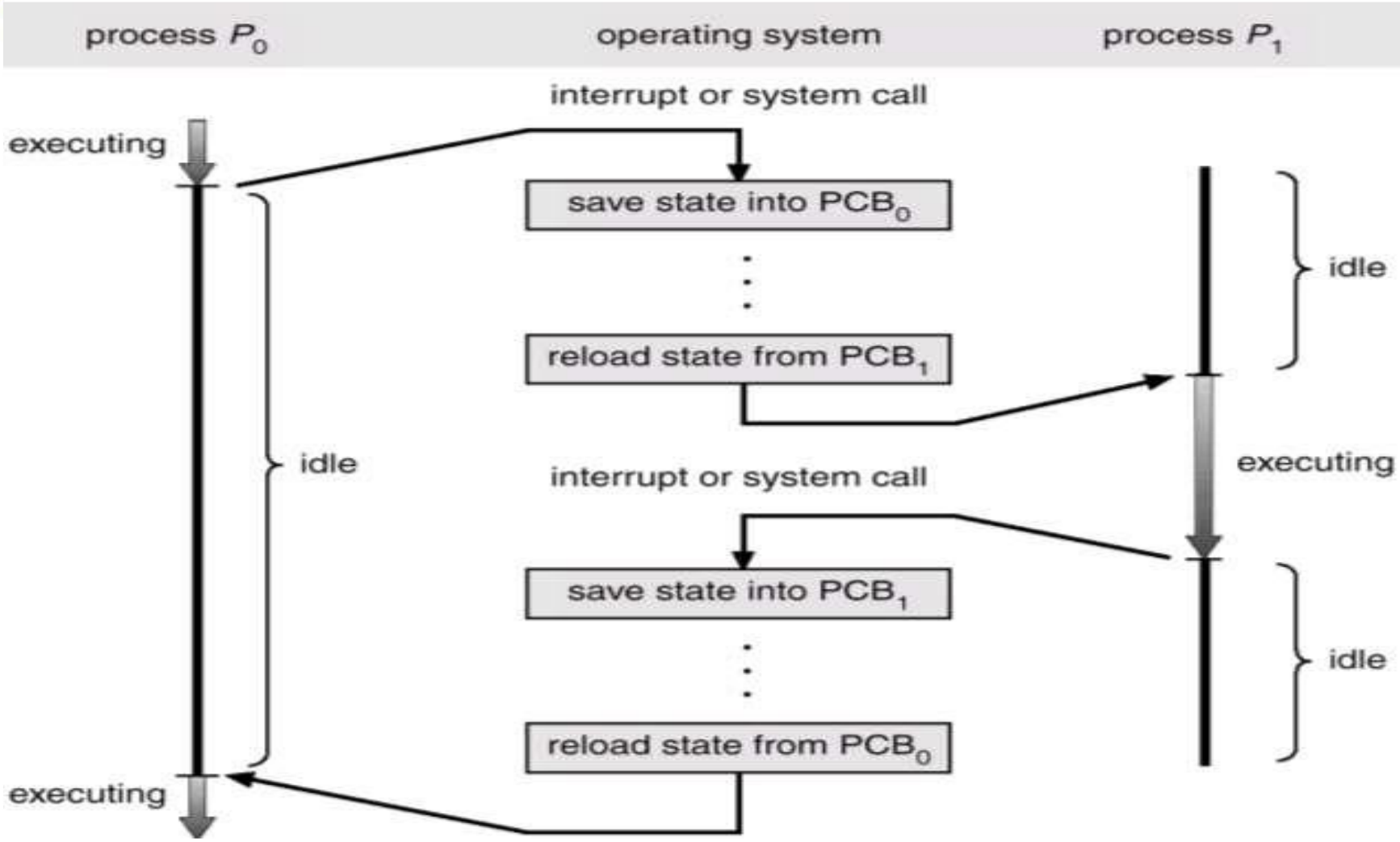
The key idea behind medium term scheduler is that some times it can be advantageous to remove process from memory (and from active contention of CPU) and thus to decrease the degree of multiprogramming. At some later time the process can be reintroduced into memory and its execution can be continued where it left off. This scheme is called swapping. Swapping (medium term scheduler) may be necessary to improve the process mix or because a change in memory requirement has overcommitted available memory, requiring memory to be freed.

Context Switch

When CPU switches to another process, the system must save the state of the old process and load the saved state for the new process.

- Context-switch time is a pure overhead and the system does no useful work while switching.
- Time dependent on hardware support.

CPU Switch From Process to Process



THANK YOU