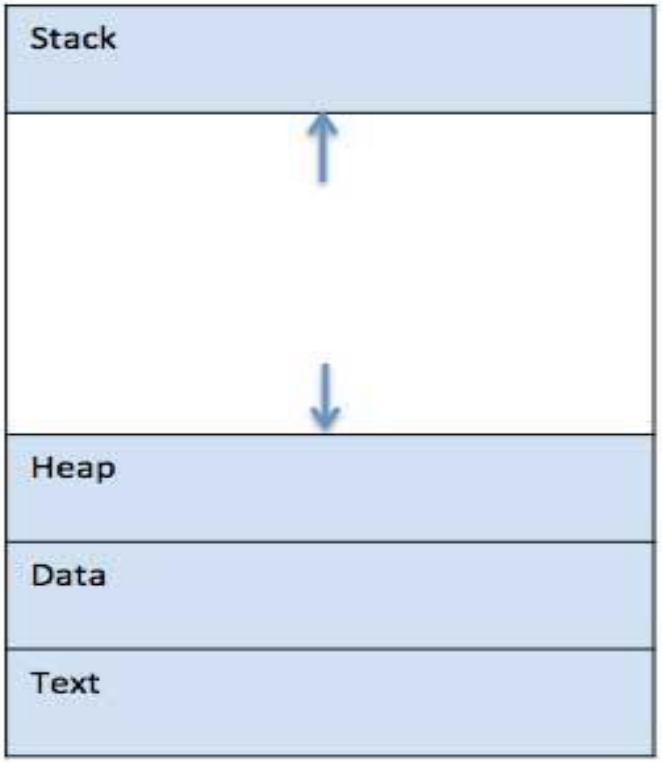
Process and its States

Process

- A program in execution is called process. A process is more than the set of instructions, besides it contains memory area, local, global variable, CPU registers, Program Counters.
- Process is an active entity that requires a set of resources, including a processors, program counters, registers, registers to perform its functions. Multiple process may associate with one program

Component of Computer System

- When a program is loaded into the memory and it becomes a process, it can be divided into four sections — stack, heap, text and data.



Types of Processes

- CPU Bound Process: If the process is intensive in terms of CPU operations then it is called CPU bound process.
- I/O Bound Process: If the process is intensive in terms of I/O operations then it is called IO bound process.

Process Control Block (PCB)

- Each process is represented in the OS by a PROCESS CONTROL BLOCK (PCB)- also called Task control Block.

Concept of Multiprogramming

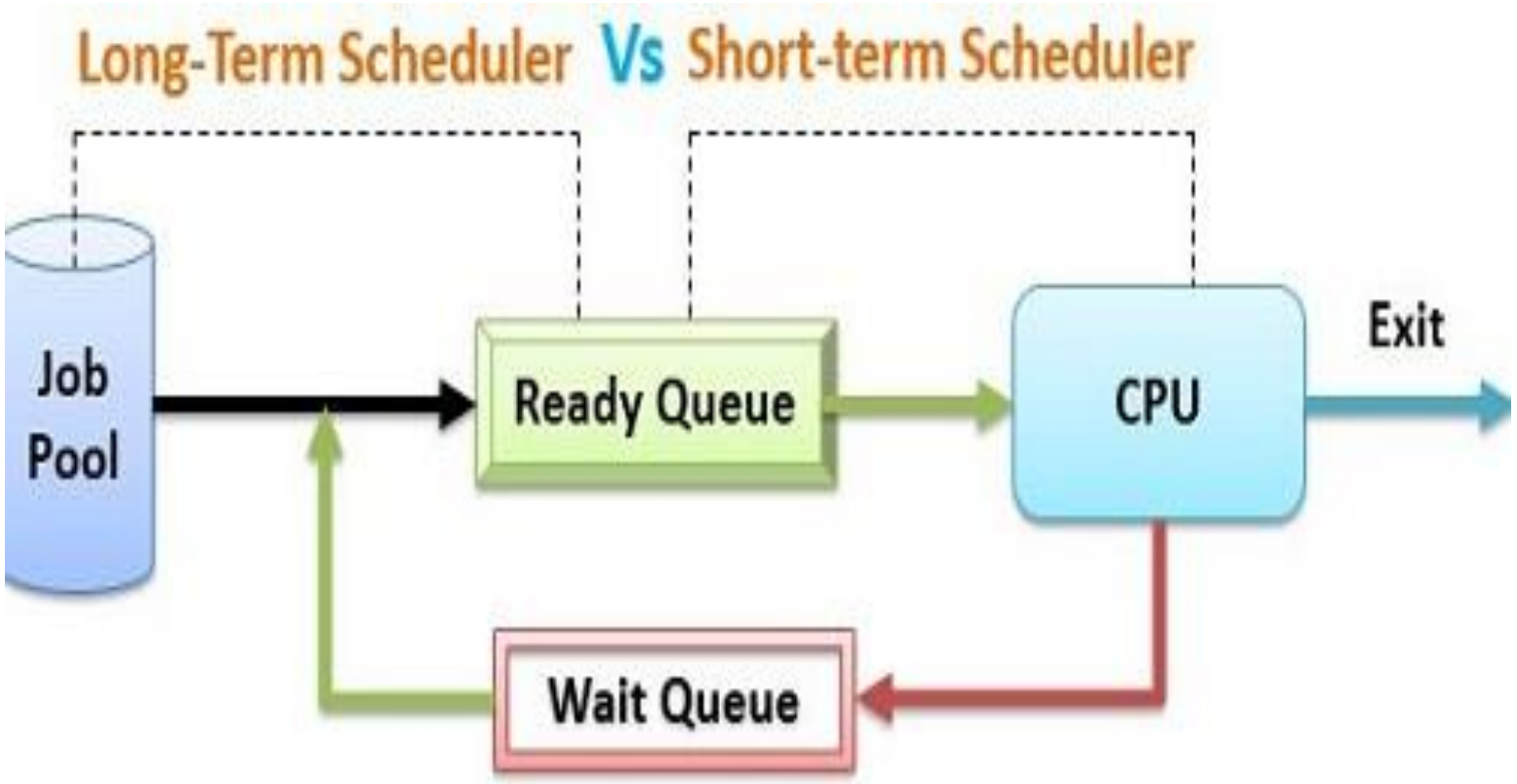
- Pre-emption – Process is forcefully removed from CPU. Pre-emption is also called as time sharing or multitasking.
- Non pre-emption – Processes are not removed until they complete the execution.

Schedulers

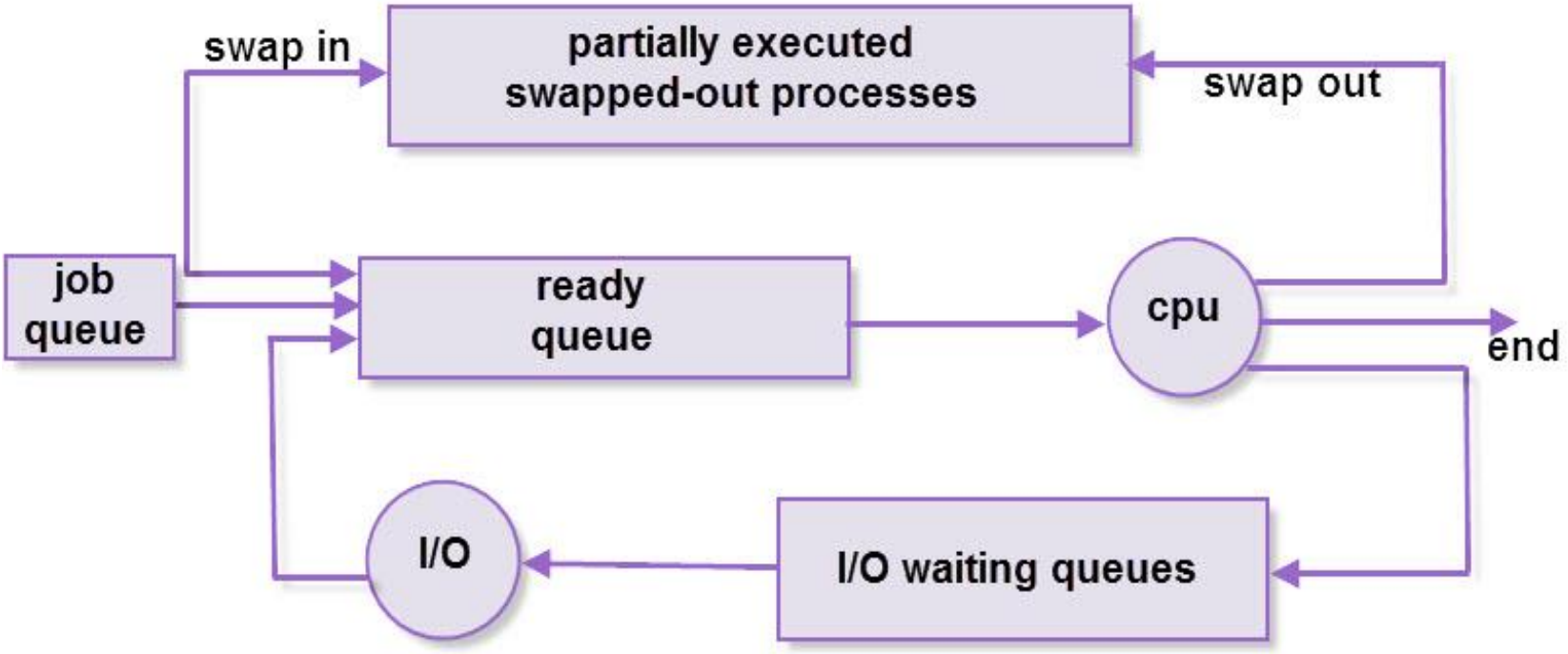
Schedulers are special system software which handles process scheduling in various ways. Their main task is to select the jobs to be submitted into the system and to decide which process to run. Schedulers are of three types −

- Long-Term Scheduler
- Short-Term Scheduler
- Medium-Term Scheduler

Long-Term Vs Short Term Scheduler

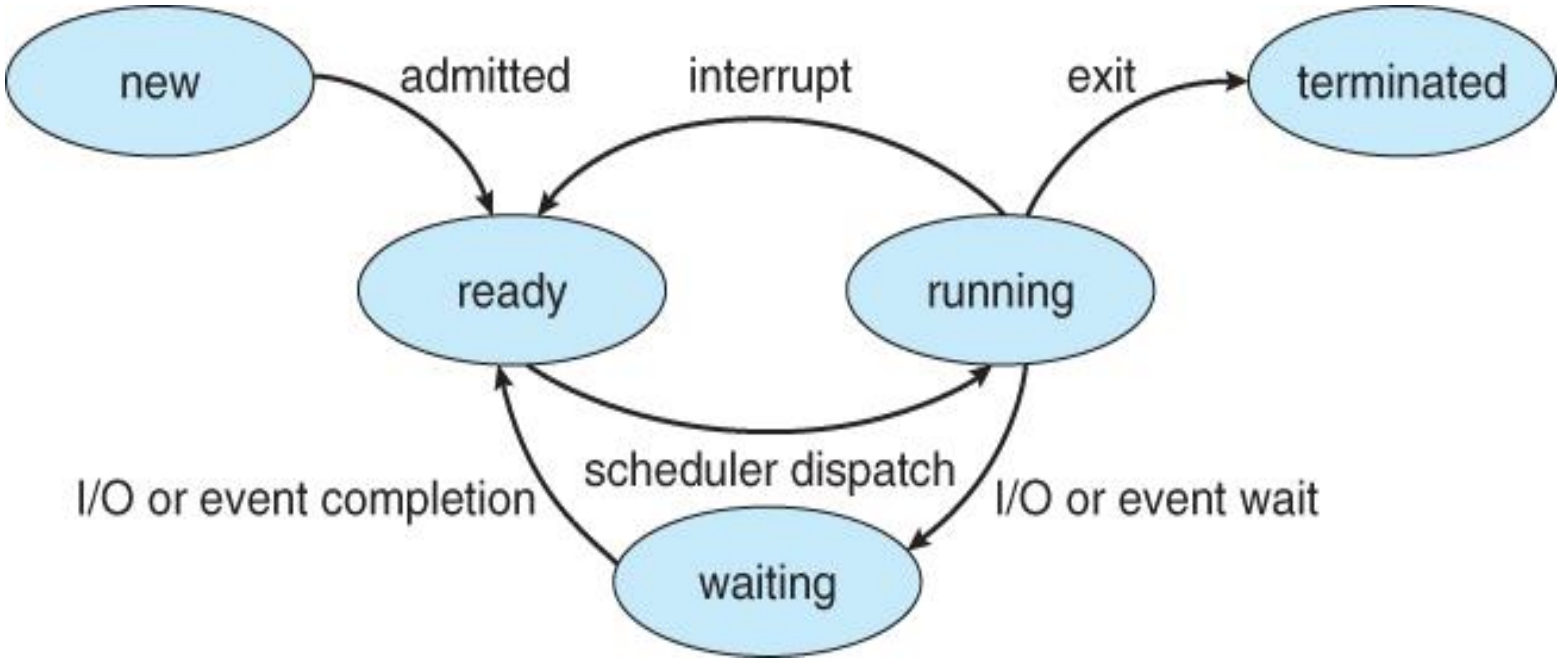


Medium Term Scheduler



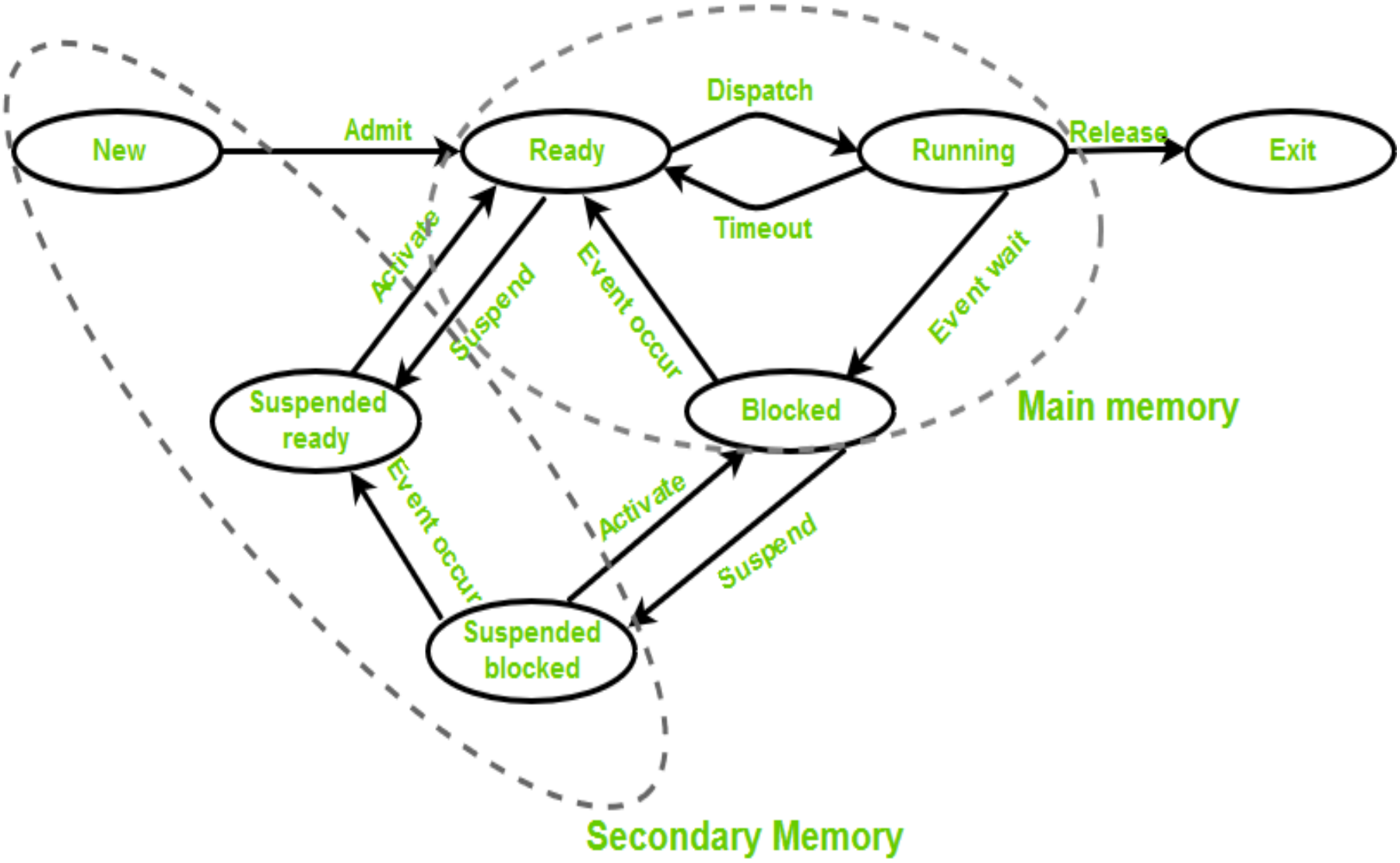
Addition of medium-term scheduling to the queuing diagram

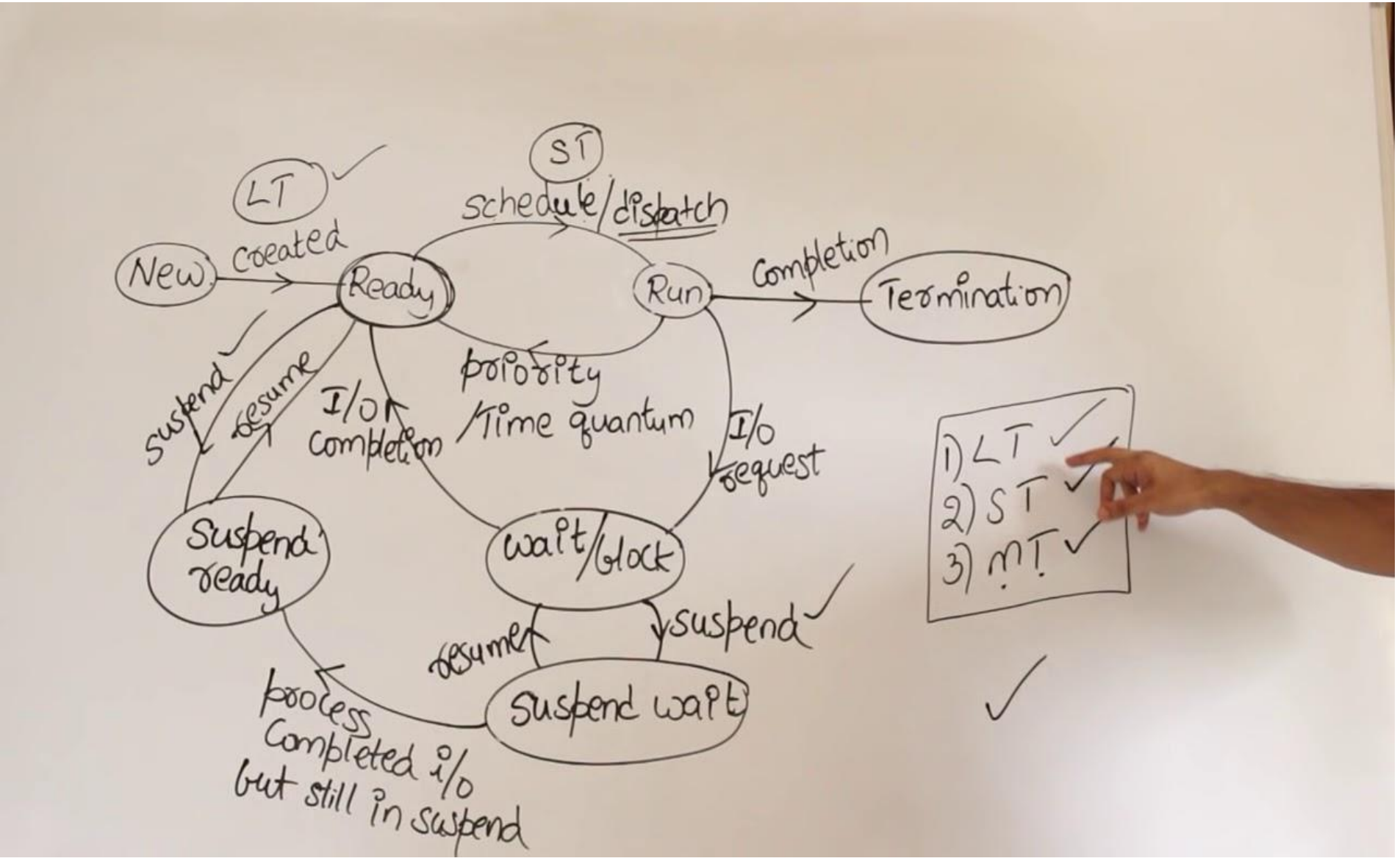
Process State Diagram (5-States)



Awake (Process-name) : New -> Ready
Dispatch (Process-name): ready -> running
Timerrunout (Process-name): running -> ready
Block(Process-name): running -> blocked
wakeup(Process-name): blocked-> ready

Process State Diagram (7 States)




LT
ST
schedule/dispatch
New
created
Ready
Run
Completion
Termination
suspend
resume
I/O completion
priority
Time quantum
I/O request
Suspend ready
wait/block
suspend
resume
process Completed i/o but still in suspend
Suspend wait
1) LT
2) ST
3) MT

Thank you