

*What happens when 'LDA s' is run?*

1

*What happens when 'STA s' is run?*

2

*What happens when 'ADD s' is run?*

3

*What happens when 'SUB s' is run?*

4

*What happens when 'JMP s' is run?*

5

*What happens when 'JGE s' is run?*

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*What happens when 'JNE s' is run?*

7

*What three steps occur during the fetch phase?*

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$$[s] = ACC$$

$$ACC = [s]$$

2

1

$$ACC -= [s]$$

$$ACC += [s]$$

4

3

*if*  $ACC \neq 0$  *then*  $PC = s$

$PC = s$

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1. Use  $PC$  as address to read memory
2. Save result of read in  $CPU$
3. Increment  $PC$  read

*if*  $ACC \neq 0$  *then*  $PC = s$

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*What control signals do all registers need?*

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*What control signal does a multiplexer need?*

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*What control signals does the memory need?*

11

*Which 3 signals control the ALU?*

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*What is a process?*

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*What is the address space?*

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*What is a thread?*

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*What is multi-threading?*

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*A signal to select an input*

*An enable signal*

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*add, sub & byp*

*Ren (read enable) and Wen (write enable)*

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*All memory locations the process can use.*

*A program in execution, the thread + address space.*

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*This is where we have multiple threads within the same process*

*A sequence of instructions that are obeyed.*

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*How do we make programs think they have sole use of memory?*

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*What are the three different approaches to engineering an OS?*

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*What are the three process states?*

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*In the diagram, what is happening at each stage?*

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*What is a PCB table?*

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*In scheduling, what do the following mean?*

1. CPU burst
2. I/O burst
3. CPU bound
4. I/O bound

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*What is a processes turnaround time?*

23

*What is a processes waiting time?*

24

*Monolithic, layered and micro-kernels.*

*Use **relocation**, where we swap a program out of memory and later swap it back in.*

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1. *Process need to wait for I/O or event.*
2. *Process forcibly preempted - **in-  
interrupt / relinquish CPU /  
time-slice expired.***
3. *Scheduler selects process to run.*
4. *I/O or event occurs.*

*Running, ready, blocked*

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1. *Process executing on CPU*
2. *Process blocked, waiting for I/O*
3. *Long CPU bursts*
4. *Short CPU bursts*

*Process control block, it contains all of the information needed about processes.*

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*The time that the process waits to run.*

*The time from a process being submitted to it getting completed.*

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*Briefly explain the first come first served scheduling algorithm.*

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*What is meant by pre-emptive scheduling?*

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*What is meant by non-pre-emptive scheduling?*

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*What is the fixed time amount called in non-pre-emptive processing?*

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*Briefly explain the shortest remaining time first scheduling algorithm.*

29

*What is process starvation?*

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*In scheduling, what are static priorities?*

31

*In scheduling, what are dynamic priorities?*

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<i>Scheduling where processes run until they are terminated or blocked.</i>	<i>The first process in the ready state gets CPU time first. Once it is blocked or complete, the next process in the queue is run. Processes that require CPU time are added to the back of the queue.</i>
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<i>The ‘time-slice’ or ‘time-quantum’.</i>	<i>Scheduling where a process can run for some fixed maximum time, once it has reached its maximum time, it is interrupted and set ‘ready’ and the scheduler runs the next process.</i>
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<i>When the scheduling algorithm leaves a process out for a long time, causing the process to not receive any CPU time.</i>	<i>For each newly ready process, if CPU-burst is less than the time to complete the running process then context-switch and run the new process.</i>
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<i>Priorities that are assigned by the system to achieve certain goals.</i>	<i>Priorities that are predetermined for each process.</i>
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- What do the following terms mean?*
- 1. Data inconsistency*
  - 2. Synchronisation*
  - 3. Critical section*
  - 4. Mutual exclusion*

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*What is deadlock?*

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*What is the base register of a program?*

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*What is the limit register of a program?*

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*What is the base register usage sequence?*

37

*What is the limit register usage sequence?*

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*What is the virtual address?*

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*What performs the virtual to physical address conversion?*

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*Where there are a set of waiting processes where each process is waiting for something that can only be provided by another of the processes.*

1. *Disagreement about data values*
2. *Using appropriate policies and mechanisms to ensure the correct operation of cooperating processes*
3. *Section of code in which shared data is used*
4. *At most 1 process can be in its critical section at once*

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*A register that is loaded with the length of the program.*

*A register that is loaded with the physical address where the program begins in memory.*

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*When the base register usage sequence happens, the OS checks if the address offered is greater than the value in the limits register, in which case a fault is generated and access aborted.*

*When the processor references memory, either fetch an instruction or read or write a data word, the CPU hardware automatically adds the base value to the address generated by the processor before sending the address out on the memory bus.*

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*The memory management unit (MMU)*

*An address that is generated by a program. It is converted to the actual 'physical address' which is used in memory.*

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*What is the difference between a partition and a program?*

41

*What are the two main reasons for virtual memory in a computer system?*

42

*What is a page table?*

43

1. *To allow a processor to address a much larger address space than is implemented by the physical memory*
2. *To support the OS in the management of processes*

*A partition is: division of the storage area of a memory.  
A program is: supplies a computer with a set of pre-written instructions.*

*A table used by the MMU to translate from a virtual to a physical address.*