

### Quiz 1

<p><b>Question 1</b> (1 point)</p> <p>What does the file <i>vmlinuz</i> contain?</p> <ul style="list-style-type: none"><li><input type="radio"/> The Master Boot Record (MBR)</li><li><input type="radio"/> The initial RAM disk</li><li><input type="radio"/> The BIOS</li><li><input type="radio"/> The Linux kernel</li></ul>	<p><b>Question 2</b> (1 point)</p> <p>Apple's Rosetta is an example of a / an</p> <ul style="list-style-type: none"><li><input type="radio"/> container platform</li><li><input type="radio"/> emulator</li><li><input type="radio"/> virtual machine manager</li><li><input type="radio"/> resource manager</li></ul>
<p><b>Question 3</b> (1 point)</p> <p>A program in memory is called a</p> <ul style="list-style-type: none"><li><input type="radio"/> process</li><li><input type="radio"/> system</li><li><input type="radio"/> executable</li><li><input type="radio"/> device</li></ul>	<p><b>Question 4</b> (1 point)</p> <p>An operating system is using DMA to transfer a 512-byte block from a device to memory. How many interrupts are generated by this DMA transfer?</p> <ul style="list-style-type: none"><li><input type="radio"/> 1</li><li><input type="radio"/> 2</li><li><input type="radio"/> 512</li><li><input type="radio"/> None of the above</li></ul>
<p><b>Question 5</b> (1 point)</p> <p>Which of the following statements is false regarding system calls?</p> <ul style="list-style-type: none"><li><input type="radio"/> A number associated with each system call</li><li><input type="radio"/> Typically written in a high-level language (C / C++) or in assembly</li><li><input type="radio"/> Usually accessed by user programs via the system call interface</li><li><input type="radio"/> None of the above</li></ul>	<p><b>Question 6</b> (1 point)</p> <p>Which of the following components run in kernel mode for a microkernel design</p> <ul style="list-style-type: none"><li><input type="radio"/> Device driver</li><li><input type="radio"/> Filesystem driver</li><li><input type="radio"/> Interprocess communication</li><li><input type="radio"/> None of the above</li></ul>
<p><b>Question 7</b> (1 point)</p> <p>Hotmail and Outlook Online are examples of</p> <ul style="list-style-type: none"><li><input type="radio"/> Information-as-a-service</li><li><input type="radio"/> Platform-as-a-service</li><li><input type="radio"/> Software-as-a-service</li><li><input type="radio"/> Desktop-as-a-service</li></ul>	<p><b>Question 8</b> (1 point)</p> <p>Which of the following is false regarding hard disk drives?</p> <ul style="list-style-type: none"><li><input type="radio"/> Movement of the arm is not done using motor, instead of a heat coil</li><li><input type="radio"/> The head is connected to an arm, which is moved by an actuator</li><li><input type="radio"/> Read / write performed by a head on a platter</li><li><input type="radio"/> Stores data on a rotating platter(s) within the disk body</li></ul>
	<p><b>Question 10</b> (1 point)</p> <p>The act of moving a process in and out of main memory is called</p> <ul style="list-style-type: none"><li><input type="radio"/> swapping</li><li><input type="radio"/> caching</li><li><input type="radio"/> virtualizing</li><li><input type="radio"/> scheduling</li></ul>

## Quiz 2

### Question 1 (1 point)

Consider the following set of processes P1, P2, P3, and P4. Assume that the processes arrive at the same time.

Process	Burst Time
P1	7
P2	12
P3	5
P4	16

Under a *round-robin* (RR) scheduler with time quantum of 4, which process will complete its burst time first?

- ☐ P1
- ☐ P2
- ☐ P3
- ☐ P4

### Question 2 (1 point)

Consider the following set of processes arriving in the order P1 (first to arrive), P2, P3, and P4 (last to arrive)

Process	Burst Time
P1	7
P2	12
P3	5
P4	16

Under a *first-come, first-served* (FCFS) scheduler, which process will start **last**?

- ☐ P1
- ☐ P2
- ☐ P3
- ☐ P4

### Question 3 (1 point)

The following are correct about programs and processes **except**

- ☐ A process is a program in execution
- ☐ A program is an active entity
- ☐ One program can be several processes
- ☐ A process is an active entity

### Question 4 (1 point)

Which of the following is **not** a process state?

- ☐ New
- ☐ Ready
- ☐ Running
- ☐ Waiting
- ☐ Terminated
- ☐ All of the above are valid process states

### Question 5 (1 point)

If a parent process terminates without invoking wait(), its child processes shall become \_\_\_\_\_ processes.

- ☐ Zombie
- ☐ Orphaned
- ☐ Idle
- ☐ Redundant

### Question 6 (1 point)

Of the following, which is **not** a section of a process in memory?

- ☐ Heap
- ☐ Text
- ☐ Code
- ☐ Stack

### Question 7 (1 point)

Consider the following set of processes P1, P2, P3, and P4. Assume that the processes arrive at the same time.

Process	Burst Time
P1	7
P2	12
P3	5
P4	16

Under a *shortest-job-first* (SJF) scheduler, which process will start **last**?

- ☐ P1
- ☐ P2
- ☐ P3
- ☐ P4

### Question 8 (1 point)

CPU scheduling decisions may take place when a process

- Switches from running to waiting state
- Switches from running to ready state
- Switches from waiting to ready
- Terminates

Of the above, a scheduling scheme is considered **non-preemptive** if scheduling takes place

- ☐ Only under 1, 2, and 4
- ☐ Only under 1, 2, and 3
- ☐ Only under 1 and 4
- ☐ Under all 1, 2, 3, and 4

### Question 9 (1 point)

The two main type of queues pertaining to process scheduling are

- ☐ Run and wait queues
- ☐ Ready and I/O queues
- ☐ Run and I/O queues
- ☐ Ready and wait queues

### Question 10 (1 point)

A round-robin (RR) scheduling algorithm with a **large time quantum** shall tend towards the performance of which scheduling algorithm?

- ☐ Priority scheduling
- ☐ Shortest-remaining-time-first (SRTF)
- ☐ Shortest-job-first (SJF)
- ☐ First-come, first-served (FCFS)

### Quiz 3

#### Question 1 (1 point)

Of the following, which is **not true** regarding user-level threads?

- Schedulable by the kernel
- Supported above the kernel
- Typically managed using a thread library
- May impact performance depending on how threads are mapped

#### Question 2 (1 point)

Consider the following set of processes arriving in the order P1, P2, P3, P4, and P5. Assume that the processes arrive at the same time.

Process	Burst Time
P1	3
P2	6
P3	5
P4	2
P5	3

Under a *shortest-job-first* (SJF) scheduler, what is the **turnaround time for process P3**?

Provide your answer as a number (e.g., 17)

#### Question 3 (1 point)

Consider the following set of processes arriving in the order P1 (first), P2, P3, and P4 (last)

Process	Burst Time
P1	3
P2	4
P3	5
P4	7

Under a *round-robin* (RR) scheduler with time quantum of 2, what is the **average waiting time** across all the processes?

Provide your answer as a number (e.g., 17), up to 2 decimal places if necessary

#### Question 4 (1 point)

Each thread has its own copy of the following, except

- A program counter
- A thread identifier
- A heap
- A stack

#### Question 5 (1 point)

Consider the following set of processes arriving in the order P1 (first to arrive), P2, P3, and P4 (last to arrive)

Process	Burst Time
P1	3
P2	6
P3	2
P4	1

Under a *first-come, first-served* (FCFS) scheduler, what is the **total waiting time for process P3**?

Provide your answer as a number (e.g., 17)

#### Question 6 (1 point)

Which of the following statements is **not true** regarding real-time CPU scheduling and real-time tasks?

- Periodic real-time tasks are real-time tasks that are repeated after a certain time interval
- Examples of real-time scheduling algorithms include rate monotonic scheduling and earliest deadline first scheduling
- Aperiodic real-time tasks have a processing time  $t$ , deadline  $d$ , and a period  $p$
- Aperiodic real-time tasks are real-time tasks that occur at any random time

#### Quiz 4

<p><b>Question 1</b> (1 point)</p> <p>Which of the following is not an approach for signal handling in multithreaded programs?</p> <ul style="list-style-type: none"><li>○ Deliver the signal to an arbitrary thread within the process</li><li>○ Deliver the signal to certain threads in the process</li><li>○ Assign a specific thread to receive all signals for the process</li><li>○ Deliver the signal to the thread to which the signal applies</li></ul>	<p><b>Question 2</b> (1 point)</p> <p>Which of the following is not true regarding thread cancellation?</p> <ul style="list-style-type: none"><li>○ If a thread disables cancellation, cancellation requests will be discarded</li><li>○ Deferred cancellation allows the target thread to periodically check if it should be cancelled</li><li>○ In asynchronous cancellation, the target thread is terminated immediately</li><li>○ Thread cancellation is the act of terminating a thread before it has finished</li></ul>
<p><b>Question 3</b> (1 point)</p> <p>What parameters does the POSIX function <code>pthread_kill</code> takes in?</p> <ul style="list-style-type: none"><li>○ The thread identifier and the signal</li><li>○ The process identifier and the signal</li><li>○ The thread identifier, the processes identifier, and the signal</li><li>○ Only the signal</li></ul>	<p><b>Question 4</b> (1 point)</p> <p>What value would you initialize a semaphore to, for a binary semaphore?</p> <ul style="list-style-type: none"><li>○ 0</li><li>○ 2</li><li>○ 1</li><li>○ -1</li></ul>
<p><b>Question 5</b> (1 point)</p> <p>Of the following, which is not considered a form of hardware support for synchronization?</p> <ul style="list-style-type: none"><li>○ Support for instruction to disable / enable interrupt</li><li>○ Compare-and-swap instruction support</li><li>○ Test-and-set instruction support</li><li>○ Semaphores</li></ul>	<p><b>Question 6</b> (1 point)</p> <p>Which of the following best describes the concept of starvation?</p> <ul style="list-style-type: none"><li>○ Multiple processes reading and writing shared data; result depends on relative timing of processes</li><li>○ Multiple processes continuously change their states in response to changes in other processes without doing any useful work</li><li>○ Multiple processes wait for each other, and none can proceed any further</li><li>○ A process is stuck because it cannot obtain the resource(s) it needs to continue</li></ul>
<p><b>Question 7</b> (1 point)</p> <p>Which of the following function pairs are often associated with semaphores?</p> <ul style="list-style-type: none"><li>○ <code>V()</code> and <code>P()</code></li><li>○ <code>sleep()</code> and <code>wait()</code></li><li>○ <code>signal()</code> and <code>join()</code></li><li>○ <code>wakeup()</code> and <code>sleep()</code></li></ul>	