

CSCI 144 Chapter 2 Quiz

Which mode does the processor check each instruction before executing? 1 point

- ☐ Kernel-Mode
- ☐ Dual-Mode
- ☐ User-Mode
- ☐ Safe-Mode

In Kernel Mode, the operating system executes with protection checks turned off. 1 point

- ☐ True
- ☐ False

What 3 things must hardware support? Check all that apply: 3 points

- ☐ Privileged Instructions
- ☐ Dual Mode Operation
- ☐ Kernel Mode
- ☐ Memory Protection
- ☐ Memory Fragmentation
- ☐ Timer Interrupts



In addition to the 3 things, the hardware must also provide a way to safely _____ from user mode to kernel mode and back. (2 words) 1 point

Your answer

Match the definitions with the definition:

3 points

	Privileged Instructions	Dual Mode Operation	Kernel Mode	Memory Protection	Memory Fragmentation	Timer Interrupts
All potentially unsafe instructions are prohibited when executing in user mode.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Regardless of what the process does, the kernel must have a way to periodically regain control from the current process	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
All memory accesses outside of a process's valid memory region are prohibited when executing in user mode	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

While application programs can use only a subset of the full instruction set, the operating system executes in kernel mode with the full power of the hardware 0 points

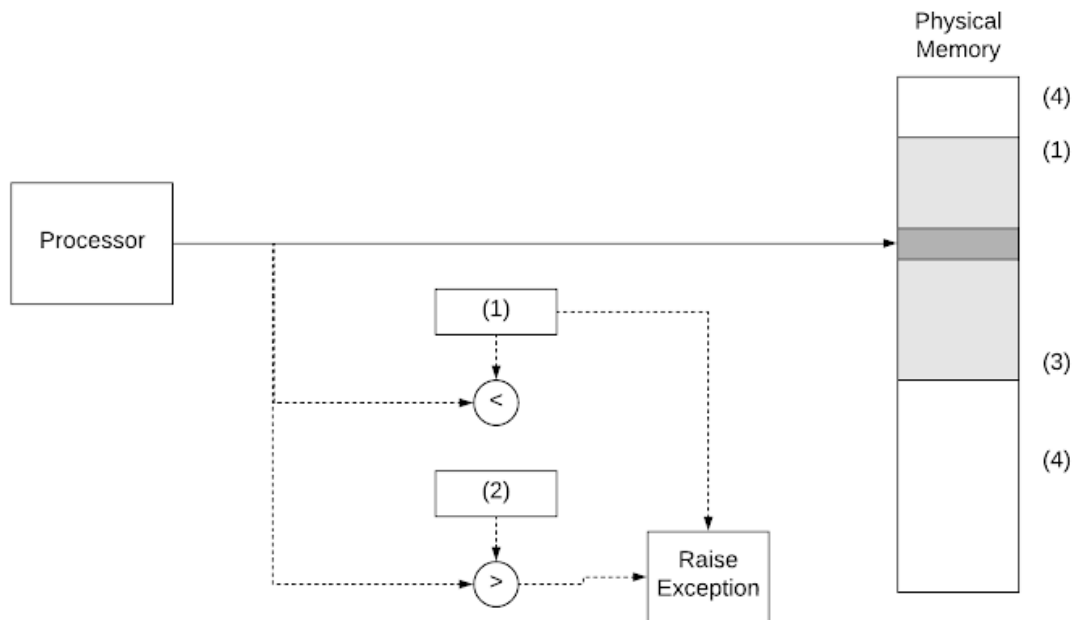
- ☐ True
- ☐ False



What happens if an application attempts to access restricted memory or attempts to change its privilege level? It will cause a: 1 point

Your answer

Please label Figure 2.5: "(1), (2), (3), (4)" 4 points



Your answer

Please check all the features physically addressed base and bound registers do not provide 4 points

- ☐ Expandable Heap and Stack
- ☐ Virtual Addressing
- ☐ Memory Sharing
- ☐ Memory Fragmentation
- ☐ Physical Memory Addresses



A device that can be set to interrupt the processor after a specified delay (either in time or after some number of instructions have been executed) is called a:

1 point

Your answer

The kernel knows if an application is in an infinite loop

1 point

- ☐ True
- ☐ False

What are the 3 reasons for the kernel to take control from a user process?

3 points

- ☐ Processor exceptions
- ☐ New process
- ☐ Resume after an Interrupt
- ☐ Interrupts
- ☐ Switch to a different process
- ☐ System calls
- ☐ User-level upcall

An interrupt is when the kernel loops, checking each I/O device to see if an event has occurred that requires handling.

1 point

- ☐ True
- ☐ False



Interrupts are also used to inform the kernel of the completion of I/O requests. 1 point

- ☐ True
- ☐ False

A processor exception is a hardware event caused by user program behavior that causes a transfer of control to the kernel. 1 point

- ☐ True
- ☐ False

Check all examples of processor exceptions: 4 points

- ☐ A process attempts to perform a privileged instruction
- ☐ A process accesses memory outside of its own memory region
- ☐ A process divides an integer by zero
- ☐ A process attempts to write to read only memory

Any procedure provided by the kernel that can be called from user level is a: 1 point

Your answer

Operating systems can NOT provide more than one system call 1 point

- ☐ True
- ☐ False



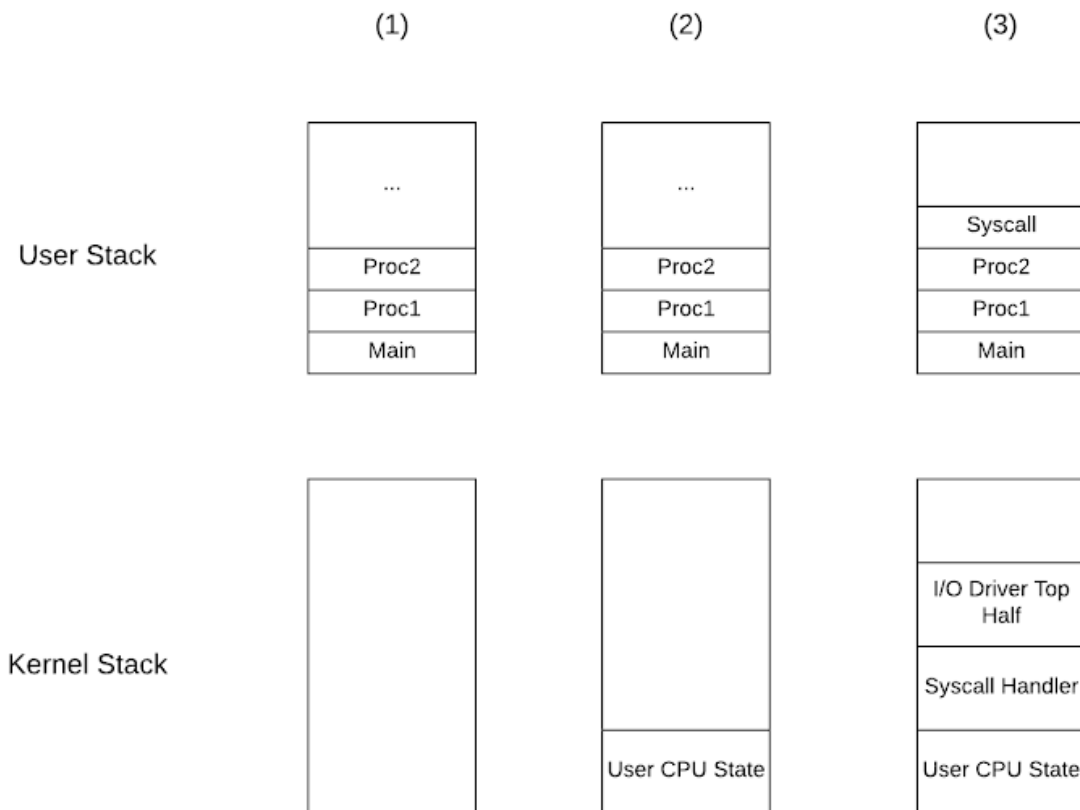
What are 4 reasons for the Kernel to transition to the User?

4 points

- ☐ Processor exceptions
- ☐ New process
- ☐ Resume after an Interrupt
- ☐ Interrupts
- ☐ Switch to a different process
- ☐ System calls
- ☐ User-level upcall

Please label Figure 2.9: "(1), (2), (3)"

3 points



Your answer



Interrupt masking is when interrupts are disabled during the handling of the existing interrupt and re-enabled when the processing is done

1 point

- ☐ True
- ☐ False

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