**Asynchronous interrupt / synchronous interrupt (i.e., exception/fault/trap).** Circle only one of A or S.

1. A / S Divide by zero

2. A / S CPU timer interrupt

3. A / S Completion of I/O operation

4. A / S System call that invokes the kernel

5. A / S Response to attempted execution of privileged instruction in user mode

**True / false.** Circle only one of T or F.

6. T / F A guest OS runs in a virtual machine provided by a host OS.

7. T / F On a multiprocessor, an interrupt causes all available processors to respond.

**Fill in the blanks.**

8. The generic response to an interrupt is:

save the \_\_\_\_\_\_PC\_\_\_\_\_\_\_\_\_\_\_\_\_\_ and the \_\_\_\_\_\_PSR\_\_\_\_\_\_\_\_\_\_\_\_\_\_

change execution mode to \_\_\_\_\_\_Kernel Mode\_\_\_\_\_\_\_\_\_\_\_\_\_\_

disable or restrict further \_\_\_\_Interrupts\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

load the new \_\_\_\_\_PC\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ from the \_\_\_\_\_Interrupt Vector Table\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

9. An interrupt return (iret) instruction needs to restore the \_\_\_\_PC\_\_\_\_\_\_\_\_\_\_\_\_ and the \_\_\_\_\_PSR\_\_\_\_\_\_\_\_\_\_\_ to provide restartable execution.

**Short Answer.**

10. Identify the two major differences between a jump-to-subroutine instruction (i.e., procedure call instruction) and a syscall instruction (i.e., software interrupt or trap instruction).

JSR doesn’t change the execution mode, while syscall goes into kernel mode.

JSR specifies an address for the entry point, while syscall takes an entry point from the Interrupt Vector Table

11. What bad thing could happen if the user had access to the CPU timer and could change the value?

The user could reset the timer and makes it run in an infinite loop.

12. What does the acronym TOCTOU stand for?

Time of check, time of use.