CMPE283 – Virtualization
Midterm Exam

Name:_____

This exam is governed by the rules posted in the class Canvas discussions forum.

Select the best answer for each question. Questions 1-10 are worth 5 points each. Questions 11-12 are worth 10 points each.

1. _____ True/False : Prior to the introduction of Intel VMX/AMD SVM, it was not possible to run an unmodified guest OS as a virtual machine on the x86 platform.

2. _____ Which of the following is a feature provided by a VMM?

A. Hiding/masking CPU features from VMs
B. Scheduling user processes on CPUs
C. Ensuring valid arguments to system calls
D. All of the above
E. None of the above

3. _____ Which of the following best describes the size of the virtual address space on 32-bit Intel CPUs?

A. Always 32 bits
B. Always more than 32 bits
C. Sometimes more than 32 bits, depending on the CPU
D. None of the above

4. _____ When operating in 64 bit (long) mode, the depth of the processor's paging structures (page directory/page table) is:

A. 2 levels deep
B. 3 levels deep
C. 4 levels deep
D. There is not enough information provided to answer the question accurately

5. _____ Which statement best describes time spent in VM Exit processing?

A. Time spent processing exits contributes negatively to VM performance
B. Time spent processing exits contributes positively to VM performance
C. Time spent processing exits has no bearing on VM performance
D. There is not enough information provided to answer the question accurately

6. _____ True/False: In a typical modern VMM using hardware assisted virtualization, a guest OS kernel runs in ring (privelege level) 0?

7. _____ Which statement best describes the treatment of external (host) interrupts raised while a guest VM is executing?

A. The interrupt is always dispatched immediately to the VM
B. The interrupt is always dispatched to the VM during the next VM entry
C. The interrupt is always dispatched immediately to the VMM
D. The treatment of the interrupt is controlled by the “external interrupt exiting” VMX control
E. None of the above

8. _____ Which of the following will occur if “exit on HLT” is disabled and a guest OS executes the HLT instruction, when running on a multiprocessor machine?

A. The VCPU will become unresponsive until a virtual interrupt is delivered
B. The PCPU will become unresponsive until a physical interrupt is delivered
C. The hypervisor will be unable to schedule other VCPUs on the PCPU that is halted
D. All of A,B, and C
E. None of A,B, or C

9. _____ Which of the following will occur if a guest OS executes “CPUID”?

A. The guest VM will always exit to the VMM
B. The guest VM will exit to the VMM if it is currently executing kernel code (eg, privilege level 0)
C. The guest VM will exit to the VMM if it is currently executing usermode code (eg, privilege level 3)
D. The guest VM will exit (or not) depending on the value of the “exit on CPUID” VMX control, regardless of privilege level

10. Describe the processor and VMM's behavior when a guest VM executes “SGDT”.

11. Describe how global pages are used and why they are beneficial to an operating system.

12. What considerations should the hypervisor author make when determinining which VMX controls to enable?