First Name:_____ Last Name: _____

1) A virtual machine (VM) is an emulation that provides a hardware interface.

- True
- False

2) A system VM allows a computer to share hardware resources amongst multiple operating systems.

- True
- False

3) When a computer runs multiple VMs, the first VM launched is called the host, and the other VMs are called the guests.

- True
- False

4) Another name for a VMM is a hypervisor.

- True
- False

5) A VMM is the same size as the corresponding OS.

- True
- False

6) A VMM should not allow a guest VM to change how resources are allocated.

- True
- False

7) A VMM runs in system mode, while a guest VM runs in user mode.

- True
- False

8)

Page fault	Protection	Virtual address	Address mapping	Virtual memory

	Mechanisms that prevent multiple processes that use the same hardware from interfering with each other.
	A technique where main memory is used as a cache for secondary storage.
	The process of mapping a virtual address to a physical address.
	An address that corresponds to a location in virtual space.
	A virtual memory miss.

9) In a virtual memory system, an _____ is typically written to the disk.

- individual word
- entire page

10) A _____ bit indicates if a page has been written since being read into memory.

- dirty
- use

11)

write-back	cache	fewer	status bits

	The TLB, or translation-lookaside buffer, is a special _____ that keeps track of recently used translations.
	Each TLB entry includes the physical page address, tag, and _____ .
	A TLB has _____ number of entries as a page table.
	A TLB entry is replaced using a _____ scheme.

12) Are the following TLB, virtual memory system, and cache miss combinations possible or impossible?

a. TLB hit, page table miss, cache miss

- Possible
- Impossible

b. TLB miss, page table miss, cache hit

- Possible
- Impossible

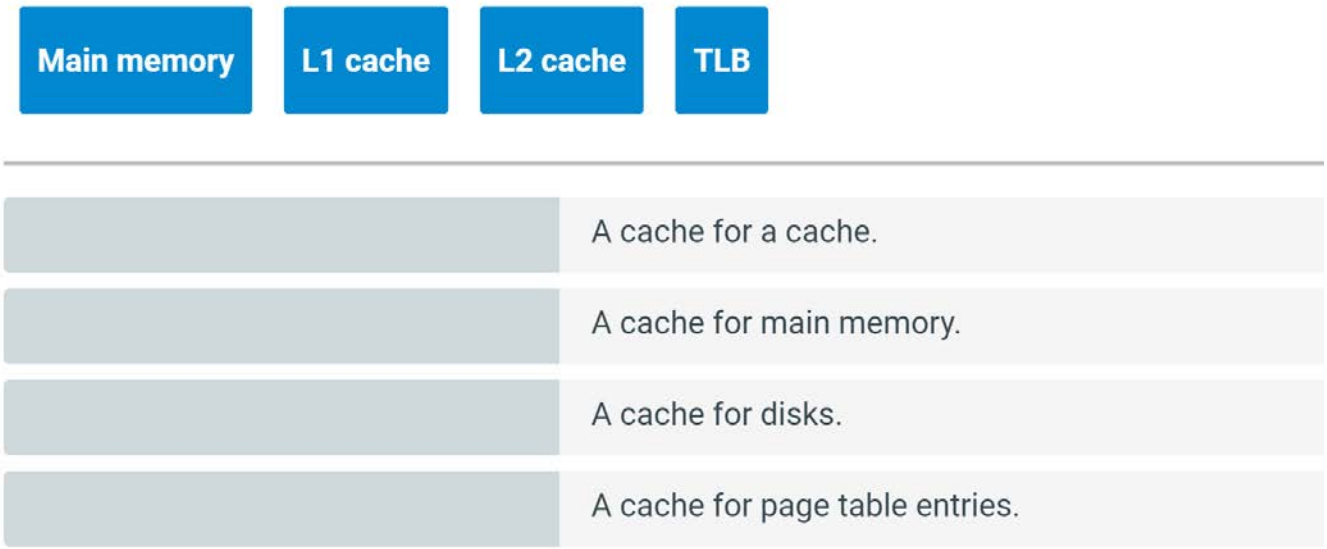
c. TLB hit, page table hit, cache miss

- Possible
- Impossible

d. TLB hit, page table miss, cache hit

- Possible
- Impossible

13)



14) The figure below depicts the memory system.

a. What is the function of TLB?
b. How many virtual pages numbers does the system have and how many bytes is each page?
c. Identify type of cache architecture
d. Complete the cache architecture by connecting the dash lines to appropriate physical address. Identify how many bits is each connection.