

### **Assignment 3**

1. In 32-bit mode, aside from the stack pointer (ESP), what other register points to variables on the stack?

**EBP**

2. Name at least four CPU status flags.

**Sign, Zero, Aux Carry, Overflow**

3. Which flag is set when the result of an unsigned arithmetic operation is too large to fit into the destination?

**Carry flag**

4. Which flag is set when the result of a signed arithmetic operation is either too large or too small to fit into the destination?

**Overflow flag**

5. (True/False): When a register operand size is 32 bits and the REX prefix is used, the R8D register is available for programs to use.

**True**

6. Which flag is set when an arithmetic or logical operation generates a negative result?

**Sign flag**

7. Which part of the CPU performs floating-point arithmetic?

**floating-point unit**

8. On a 32-bit processor, how many bits are contained in each floating-point data register?

**80 bits**

9. (True/False): The x86-64 instruction set is backward-compatible with the x86 instruction set.

**T**

10. (True/False): In current 64-bit chip implementations, all 64 bits are used for addressing.

**F**

11. (True/False): The Itanium instruction set is completely different from the x86 instruction set.

**T**

12. (True/False): Static RAM is usually less expensive than dynamic RAM.

**F**

13. (True/False): The 64-bit RDI register is available when the REX prefix is used.

**T**

14. (True/False): In native 64-bit mode, you can use 16-bit real mode, but not the virtual-8086 mode.

**F**

15. (True/False): The x86-64 processors have 4 more general-purpose registers than the x86 processors.

**F**

16. (True/False): The 64-bit version of Microsoft Windows does not support virtual-8086 mode.

**T**

17. (True/False): DRAM can only be erased using ultraviolet light.

F

18. (True/False): In 64-bit mode, you can use up to eight floating-point registers.

T

19. (True/False): A bus is a plastic cable that is attached to the motherboard at both ends, but does not sit directly on the motherboard.

F

20. (True/False): CMOS RAM is the same as static RAM, meaning that it holds its value with-out any extra power or refresh cycles.

F

21. (True/False): PCI connectors are used for graphics cards and sound cards.

T

22. (True/False): The 8259A is a controller that handles external interrupts from hardware devices.

T

23. (True/False): The acronym PCI stands for programmable component interface.

F

24. (True/False): VRAM stands for virtual random access memory.

F

25. At which level(s) can an assembly language program manipulate input/output?

Hardware and software (operating system and BIOS)

26. Why do game programs often send their sound output directly to the sound card's hardware ports?

It is faster and more efficient, which is necessary for games.