Worksheet #2: First Look

True/False Section

1. In a computer system, a clock provides a way to synchronized different things that are happening in the computer.
	- True

2. In a computer system, the clock also keeps the time of day.
	- False

3. In most computer systems, memory is composed of lots of â\200\234bitsâ\200\235 that can remember data. Each bit can remember the number 0, 1, or 2.
	- False. 0 and 1 only

4. The type of memory that holds a program when it is being executed by the computer is generally called the primary memory or primary storage, and it is also called RAM (random access memory).
	- True

5. ERAM is a type of random access memory that is extra fast.
	- False

6. Secondary storage is another type of memory that is faster than primary storage, but cost more money, so there is less of it in a computer.
	- False

7. In a modified Harvard architecture, certain areas of memory can be configured as read-only, executable, and/or read-write.
	- True

8. In a 5-stage instruction execution cycle, the fetch stage is used to fetch an instruction to execute.
	- False

9. In a 5-stage instruction execution cycle, the fetch operands stage is used to fetch anything that the instruction might need from memory (that is, any operands needed by the instruction).
	- True

10. In main memory, in virtually all current modern processing architectures, each byte in memory has an address.
	- True

11. Theoretically, you could design a computer architecture where only each double word (the equivalent of 4 bytes) is addressable.
	- True

12. In the x86-64 architecture, there are 16 general purpose registers that are 64-bit in size.
	- True

13. If I just want to access the lowest byte of the RAX register, I can reference AL in instructions.
	- True

14. If I just want to access the lowest byte of the RDI register, I can reference DIL in instructions.
	- True

15. If I just want to access the lowest byte of the RFLAGS register, I can reference RFL in in
structions.
- False

16. The RIP register has the address of the last instruction that caused the computer to die.
- False

17. The address bus (or the address portion of the system bus) allow the memory to tell the pr
ocess the
address of the memory that was just read.
- True

18. In an x86 assembly program, the instruction can be either an actual x86 instruction, a pse
udo
instruction, a directive, or the name of a register.
- False

19. Instructions always has at least one operand.
- False. The xlat instruction does not require an operand

20. You can use either the ; (semicolon) or # (hash tag) to start a comment.
- True

21. In little-endianness, the memory address of a given value in memory, whether taken as a by
te,
word, double word, or quad word, is the same.
- True

22. There is only one set of page tables used on an x86-64 computer.
- False

23. A page fault tells the OS that a page is not in physical memory.
- False

24. Page tables for a specific process must be in memory while a program is running in that pr
ocess.
- True

Short Answer

1. What is the difference between these three sections:
a. .data
- Holds label declarations and other predefined data needed for program flow
b. .text
- The instructions the program will execute.
c. .bss
- Uninitialized data is stored here. Variables are declared but have no conten
t

2. What is the decimal equivalent of these byte sized binary numbers?
a. 10000000
- Unsigned: 128
- Signed: -128
b. 11111111
- Unsigned: 255
- Signed: -1

3. In your own words, give a definition of little-endianness.
- LSB is first. If DEADBEEF is stored, it will be stored as DEADBEEF where in big endi
an it would be stored as FEEBDAED
4. On a 64-bit Linux system (how big is the page size?) How many pages are available on a comp
uter
that has 8 Gigabytes of memory?
- 4 GB per page. Therefore we have 2 pages. This information may vary, run ‘getconf PA

GESIZE‘ and the page size is given in bytes.

5. What is the difference between the EIP register and the RIP register?
   - EIP register is the 32bit version of the RIP register

6. What is the name of the 32-bit register equivalent of the R8 register?
   - r8d