NOTE: THIS TEST IS OPEN BOOK. IF YOU DON’T KNOW THE ANSWER, LOOK IT UP. ALSO FEEL FREE TO GO TO THE POWERPOINTS OR OTHER HELPFUL FILES IN CANVAS. I MUST RECEIVE THE COMPLETED TEST AT [HRHINE@COLLIN.EDU](mailto:HRHINE@COLLIN.EDU) BY 11:59 PM, July 15, 2023. DON’T FORGET, I EXPECT A THOUGHTFUL RESPONSE TO THE ESSAY QUESTION. DON’T BLOW IT OFF. BE SURE TO PUT YOUR FIRST INITIAL AND LAST NAME IN THE NAME OF THE TEST FILE YOU SEND BACK TO ME. 2 POINTS OFF IF I HAVE TO RENAME YOUR FILE! If you send your test to me in pdf format, I cannot edit pdf files so you will not be able to see what you got wrong. If you want to see what you got wrong send me the test as a Word or Pages document.

**NAME \_\_ Rohit\_Truesdale\_\_**

**GRADE \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

1. Which unit of the CPU controls the flags register?

By the CPU’s control unit

1. If both inputs of an And gate are set (ie, =1) what is the value of the output of the And gate?

output comes out to be: 1

1. Memory can be either read or written to. How does the memory know which action to perform?

When its read there exists and address bus, Enable verification wire, and a data bust with order. When its write, only Address bus, data Bus and a set wire are engaged to represent write opposed to read.

1. RAM (Random Access Memory) -- what makes it random?

Any of what is stored in memory can be accessed anywhere in whatever order

1. CRCS, also called checksums, are used to validate transmitted packets. What is the function used to calculate a checksum called?
2. Linking c. compiling
3. Hashing d. assembling

6. Typically, data translation and data transformation are used to \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ data bases.

a. shrink the size of b. simplify

c. prevent changing of c. validate

1. Which of the following is correct
2. Attempting to anonymize a large set of patient health records for public research use is unlikely to be successful.
3. We can usually successfully anonymize a large dataset of patient health records for public research use by replacing patient names with numbers.
4. We can usually successfully anonymize a large dataset of patient health records for public research use by replacing patient names with numbers, and removing street addresses.
5. We can usually successfully anonymize a large dataset of patient health records for public research use by leaving the patient names, but removing their street address, towns, and zip codes from the dataset.
6. What information do the first 4 bits of the IPv4 and the IPv6 packet give?

The first four bits allow a system to discern the difference between what type of packet is going about to be interpreted. For IPv4 packets, these bits are always set to '0100', indicating that it is an IPv4 packet. For IPv6 packets, these bits are always set to '0110', indicating that it is an IPv6 packet.

1. How can you allow the CPU to ignore a *Maskable interrupt* (IRQ) ?

Apparently every maskable interrupt has a bit that can flip to signify the cpu to either respond or ignore the request. If the bit is set to 1, cpu responds, if it is 0 cpu ignores.

1. How is the Arithmetic Logic Unit able to do a subtraction in a compare instruction without changing the value of either the register or the memory, whichever applies?

When we compare things, we usually use subtraction to find out if one thing is bigger, smaller, or equal to another thing. The subtraction gives us a result, and based on that result, we update some flags that tell us if the answer is negative, positive, or zero. However, unlike regular subtraction where we save the result in a register, in comparison instruction, we don't save the result anywhere. This means that the value of the things we're comparing, like numbers stored in registers or memory, doesn't change. We just check the flags to see the result of the comparison.

**FILL IN THE BLANK:**

1. \_\_\_\_\_\_\_\_\_more code: Scripts, Parsers, Validators..etc\_\_\_\_\_\_\_\_\_\_ make required changes to databases so that very little manual effort is needed.

**TRUE OR FALSE:**

12. \_\_F\_\_\_ Sequence information in the IP packet header allows correct handling of lost, delayed, or out-of-sequence packets.

13. \_\_\_T\_\_ Each decision point in a program is a point of vulnerability.

14.\_\_\_T\_\_ In modern protocol design, protocols are layered to form a *protocol stack*.

15. \_\_T\_\_Multiple numbers, be it address or data, can be on the bus at a time.

16. \_\_T\_\_Device drivers typically operate in a highly privileged environment.

17. \_\_F\_\_ Device drivers cannot cause system operational issues if something goes wrong.

18. \_\_T\_\_ Hardware interrupts are used by devices to communicate that they require attention from the operating system.

19. \_\_T\_\_ A software interrupt is caused either by an exceptional condition in the processor itself, or a special instruction in the instruction set which causes an interrupt when it is executed.

20. \_\_F\_\_\_ . The number of hardware interrupts is not limited by the number of interrupt request (IRQ) lines to the processor.

21. \_\_F\_\_ An interrupt can only be triggered by a leading edge.

22. \_\_F\_\_ The run-time stack is handled by the BIOS.

23. \_\_\_T\_\_ If using AND or OR, for example, the two operands must be the same size.

24. \_\_\_T\_ Combinatorial explosions are the unwelcome result of complexity, especially the use of many decision points.

25. \_\_\_T\_\_ A typical use of an interrupt is to sense key-presses. ctrl c for most terminate terminals

26. \_\_T\_\_ Memory locations have addresses, and a memory location might contain an address.

27. \_\_T\_\_\_ The human brain is hard-wired to look for patterns.

28.. \_F\_\_ Translation of data means that the value in the field or cell is modified.

29. \_\_T\_\_ Semiconductors only behave as electrical conductors some of the time.

30. \_\_F\_\_ Half-duplex links can send and receive data at the same time.

**Essay question:**

We have probably all heard by now about the drones the military uses. There

are no people on it, but it is piloted remotely. Now, there are pilotless drones, the X-47B model, steered by on-board robots and currently being tested by the Navy on Chesapeake Bay. They land themselves on aircraft carriers, they know what kind of weapon they carry, when and where they need to refuel with an aerial tanker, and whether there is a nearby threat.

“More aggressive robotry development could lead to deploying far fewer U.S. Military personnel to other countries, achieving greater national security at a much lower cost and most importantly, greatly reduce casualties.” --Simon Ramo (author of ***Let Robots Do The Dying***)

“Lethal actions should have a clear chain of accountability. This is difficult with a robot weapon. The robot cannot be held accountable. So is it the commander who used it? The politician who authorized it? The military’s acquisition process? The manufacturer?” Noel Sharkey (computer scientist and robotics expert)

What are your thoughts on this issue?

Not that I’m entirely a pacifist, but sometimes you have to wonder what could have been built with the same man hours put into tools of destruction, espionage, and control? I think it’s very cool that we have these very complex platforms that autonomously fly around and have super abilities like performing the calculations that require mid-flight precision for fueling from another plane. That's awesome. We could build the fastest distribution system using the same technologies but just in a different market. For now let’s figure out who to blame, when the government lands it on someone else's house in a different country.

I’d say I really started being intrigued by politics in the last year and half. I love watching debates between senate, house representatives, committees, and cabinet members but one thing I’ve really learned (whether this is a human thing, or just really very apparent in politics) is, people never take the blame, and someone else is always out there trying to find the people to blame. I get that its bad flak for most public representatives, but I'd vote for someone who is willing to say “We messed up and this is how we fixed it after”. We would have an economic explosion, if our culture influenced people to step up, take the blame, then learn from it and fix the problem. The economical world of computers and many other markets have already proved that iteration is a great means of growth, yet we refuse to iterate when it comes to humans needing to change something within themselves.

I think the real right answer is, if you want to blame someone for a mishap, simply detective your way through until you find the team that was responsible for the error in the particular production of the plan, then you address them and their fault. then go back and reiterate.

I think a robot weapon itself isn't what you hold accountable ever. No one ever holds an atomic bomb itself accountable (what does that even mean) but rather the countries that house it.

By the way this isn’t a part of the essay but I wanted to mention, I had a friend who helped create and train some algorithms to allow autonomous flight for these drones a few years back, and he told me how sophisticated these drones actually are. I hope one day they get used for something else, other than spying, and providing airstrikes.