Quiz - Paper 2

Instructions

- This quiz contains 25 multiple-choice questions.

- Select the best answer for each question.

- Time allowed: 30 minutes.

1. What is the difference between malloc() and calloc() in C?
   - A) malloc() allocates uninitialized memory while calloc() initializes memory to zero
   - B) malloc() allocates for one block while calloc() allocates for arrays
   - C) malloc() is faster than calloc() but uses more memory
   - D) There is no difference except parameter format

2. In C, what does the volatile keyword indicate?
   - A) The variable can be changed by external factors outside program control
   - B) The variable should be stored in fast access memory
   - C) The variable cannot be optimized away by the compiler
   - D) Both A and C

3. What does this C code snippet do?

   ```
   int x = 5;
   int y = x++ + ++x;
   ```

   - A) Sets y to 11
   - B) Sets y to 12
   - C) Causes undefined behavior
   - D) Compilation error

4. What's the output of: printf("%d", sizeof(int[10])/sizeof(int))?
   - A) 10
   - B) 40
   - C) Depends on the compiler
   - D) Memory address

5. What problem does this C macro solve?

```
#define max(a, b) \
  ({ typeof (a) _a = (a); \
     typeof (b) _b = (b); \
     _a > _b ? _a : _b; })
```

   - A) Avoids double evaluation side effects
   - B) Makes max work with any data type
   - C) Creates thread-safe maximum function
   - D) Both A and B

6. When your IDE autocompletes your curly braces, it's secretly thinking:
   - A) "I've prevented 17 syntax errors you would have made in the next hour"
   - B) "I'll still let you stare at this code for 20 minutes before you notice the semicolon is missing"
   - C) "Look at me doing the bare minimum and expecting gratitude"
   - D) "My human thinks they're coding but I'm doing all the real work here"

7. What's the real meaning of "RTFM" in technical support?
   - A) "I've never read the manual either but want to sound superior"
   - B) "This question is asked so often there's a shrine dedicated to it in the documentation"
   - C) "The answer is on page 573 of a 1200-page PDF I haven't opened since 2007"
   - D) "Let me Google that and pretend I knew all along"

8. When a developer says they'll fix a bug "when I have time," they actually mean:
   - A) "When the heat death of the universe makes this bug irrelevant"
   - B) "When the bug becomes sentient and fixes itself"
   - C) "When I've exhausted all possible excuses not to fix it"
   - D) "When three more customers report it and my manager questions my existence"

9. What happens when the product manager says "just one more quick feature before release"?
   - A) Time itself warps to create a reality distortion field where "quick" means "three more sprints"
   - B) Developers spontaneously develop the ability to age a decade in a week
   - C) The CI/CD pipeline achieves sentience and files for emotional distress
   - D) The feature is actually implemented quickly, and everyone is suspicious

10. What does "I've optimized our codebase" usually translate to?
    - A) "I've replaced readable code with arcane incantations that will summon debugging demons"
    - B) "It's 0.02% faster but completely unmaintainable"
    - C) "I've deleted all the comments because real programmers don't need them"
    - D) "I've rewritten someone else's perfectly functional code to match my preferences"

11. If Professor [X] says "Pointers are the foundation of C," the correct interpretation is:
    - A) "Your dreams will be haunted by memory leaks for the next semester"
    - B) "80% of you will submit segmentation faults instead of programs"
    - C) "I enjoy watching the exact moment your confidence leaves your body during labs"
    - D) "All of the above, and I'm not even sorry about it"

12. The half-life of free pizza in a programming lab is measured in:
    - A) Nanoseconds multiplied by the distance to the announcement email server
    - B) The time it takes for the last person wearing headphones to notice
    - C) Planck time units — it essentially disappears instantly
    - D) The compile time of your largest project divided by the number of hungry interns

13. Complete the equation: Debug time = (Hours spent writing the code) × (Hubris level) ÷ ?
    - A) Number of rubber ducks on your desk
    - B) Cups of coffee consumed while writing said code
    - C) Characters in your error message that actually help
    - D) Useful comments you didn't bother to write

14. What's the most effective way to name C pointers?
    - A) p_thing, pp_thing, ppp_thing until your keyboard breaks from overuse of the p key
    - B) thing_ptr, except when you forget and use ptr_thing, creating naming conventions chaos
    - C) Whatever cryptic abbreviation will confuse your future self the most
    - D) Single letters that give absolutely no hint about what they point to

15. Which debugging technique do C programmers fear admitting they use most?
    - A) Adding 500 printf statements and slowly removing them one by one
    - B) Staring intensely at the screen hoping the bug reveals itself out of intimidation
    - C) Explaining the problem to an inanimate object while colleagues silently judge
    - D) Giving up, rewriting the entire function, and creating three new bugs

16. True or False: Adding more comments to your C code makes the program run faster.
    - A) True, the compiler feels appreciated and optimizes out of gratitude
    - B) False, but it helps you remember what your code does five minutes after writing it
    - C) True, but only if your comments include compliments to the CPU
    - D) False, excessive comments create a text burden that weighs down execution speed

17. What's the technical term for C code that compiles with zero warnings?
    - A) Mythological artifact
    - B) Statistical impossibility
    - C) Compiler Stockholm Syndrome
    - D) Suspiciously broken but in ways we don't understand yet

18. If you dream about buffer overflows, does your brain crash?
    - A) Yes, that's literally what waking up disoriented is
    - B) No, the human brain implements dynamic memory allocation
    - C) Only if you've exceeded your daily stack of pancakes
    - D) It depends on whether your subconscious has garbage collection

19. When is it appropriate to use goto in modern C code?
    - A) Only when you want to make senior developers cry
    - B) When you're writing a compiler or operating system kernel
    - C) In very specific error handling cases that you'll have to defend in every code review
    - D) When you want to ensure job security through code no one else will touch

20. What happens if you run classic C code on a quantum computer?
    - A) All your uninitialized variables simultaneously contain every possible value
    - B) Pointers become so uncertain that even observed memory can't be trusted
    - C) Schrödinger's buffer: it's both overflowed and secure until measured
    - D) NULL becomes a philosophical concept rather than a memory address

21. If you code C with your eyes closed, why do segmentation faults still occur?
    - A) Because pointers can sense fear even without visual confirmation
    - B) Memory allocation failure is a state of mind, not a visual experience
    - C) The bugs are coming from inside your muscle memory
    - D) Your keyboard has learned your most common mistakes and makes them automatically

22. What's the correct ritual before running a C program for the first time?
    - A) Preparing a sacrificial backup of all your important files
    - B) Writing your will and testament in case of catastrophic memory corruption
    - C) Placing valgrind in a circle of salt around your computer
    - D) Repeatedly muttering "it's just a segfault, it's just a segfault" to build emotional resilience

23. How does commenting your C code in Klingon affect maintainability?
    - A) Increases it, as only the worthy will have the courage to modify your battle-tested code
    - B) Decreases it, unless your team consists entirely of Star Trek convention attendees
    - C) Creates a temporary causality loop where you become your own legacy code maintainer
    - D) Results in mandatory team-building exercises centered around Klingon language classes

24. What actually causes most "array index out of bounds" errors?
    - A) Off-by-one errors caused by the universal confusion about whether arrays start at 0 or 1
    - B) The compiler secretly adding or removing elements when you're not looking
    - C) Your absolute conviction that you "definitely allocated enough space for everything"
    - D) Cosmic rays flipping bits in your loop counters, obviously

25. How many C header files can a programmer include before their code achieves consciousness?
    - A) One more than whatever your current project has
    - B) #include <limits.h> has the answer, appropriately
    - C) It's inversely proportional to the programmer's understanding of each header
    - D) None, it's .c files all the way down