CSc 372 Quiz 5: Midterm Warmup

Name	
UA Email	

This is a participation quiz and will be graded based on completion, not on accuracy. However, please do attempt to answer the questions as best you can so that I get an idea of where you are w.r.t. midterm preparedness. Put a `?` for questions you have no idea on.
Sources: reading assignments, ChatGPT conversation 4 Feb 2025.

Question 1 [2 pt]. The following code is a portion of the code snippet from lecture 6. What are the tokens for this program? (Separate the tokens with commas).

IF y { z = 42 }

Question 2 [2 pt]. Using the grammar rules as defined below, draw a parsing tree for the code in question 1.

```
start      -> stmts EOF
stmts      -> ε | stmt stmts
stmt       -> ifStmt | whileStmt
ifStmt     -> IF id { stmts }
whileStmt  -> WHILE id { stmts }
```

Question 3 [1pt]. Put the letter for the best answer or a ? in this box …………………….....
Which of the following is a match for this regular expression?

```
(0[1-9]|1[0-2])/(0[1-9]|[12][0-9]|3[01])/[0-9]{4}
```

A. 02/06/2025
B. 2/6/2025
C. 2/06/2025
D. 02/6/2025

Question 4 [1pt]. Put the letter for the best answer or a ? in this box ....

What are the primary advantages to using polymorphic type checking in a statically-typed language?

    A. The data type of every variable must be specified explicitly during function declaration, making the code less flexible but more predictable.

    B. It enables great flexibility in code design by allowing functions to work with different types without needing to rewrite or overload them, while still maintaining type safety.

    C. It makes code easier to write because type checking is bypassed altogether, allowing greater freedom in variable assignments.

    D. It reduces the complexity of type inference by explicitly requiring all types to be declared in advance, simplifying the type system.

Question 5 [1pt]. Put the letter for the best answer or a ? in this box ....

Which of these SML functions correctly concatenate a list of strings and in the right order?

```
A. fun concat (lst:string list) = foldl (fn (x,acc) => acc) "" lst
B. val concat = foldl (fn (_,a) => a+1) 0
C. val concat = foldl (fn (x,a) => a^x) ""
D. val concat = foldl (fn (x,a) => x^a) ""
```

Question 6 [1pt]. Put the letter for the best answer or a ? in this box ....

Which line below DOES NOT use or define a higher-order function?

```
A. fun square (x: real) = x * x
B. map Int.toString [1, 2]
C. fun pairString showa showb (a, b) = "(" ^ showa a ^ ", " ^
   showb b ^ ")"
D. val sum = foldl (fn (x, y) => x + y) 0 [1, 2, 3, 4]
```

Question 7 [1pt]. Put the letter for the best answer or a ? in this box ....

    Given:
```
fun applyTwice(f, x) = f(f(x));
val result = applyTwice(fn x => x + 2, 5);
```
    Which function is the lambda function, and what is the value of `result`?

```
A. fn x => x + 2, 7
B. applyTwice, 9
C. fn x => x + 2, 9
D. f(f), 9
```

Question 8 [1pt]. Write the SML code that uses a lambda function to determine if a number is even (Hint: Modulo in SML is 'mod').

Future Questions

Questions 6 [1pt]. Put the letter for the best answer or a ? in this box …………………..... ☐
Why is Ada used for safety-critical applications?
- A. The programming language is easy to learn and use.
- B. The programming language enforces strong data type rules and implements extensive runtime checks to minimize errors.
- C. The programming language has built-in support for managing parallel tasks in real-time systems.
- D. The programming language is popular so many people already know it.

Question 10 [1pt]. Put the letter for the best answer or a ? in this box …………………..... ☐
Which of the following is NOT a valid syntax rule defined by Backus-Naur Form (BNF)? Hint: Determine the Terminal vs Non-Terminal expressions.
- E. <op> ::= + | * | AND | OR
- F. <value> ::= INT | BOOL
- G. <expr> ::= <value> | <expr> <op> <expr>
- H. <value> ::= <op> ::= <expr>