## Principles of Programming Languages - Final

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## **1** Instructions

- 1. Each question is worth 4 points.
- 2. Attempt as many problems as you can. You will be given partial credit, as per the policy discussed in class.

## 2 Problems

- 1. Describe with examples the difference between storage semantics and pointer semantics when it comes to assignment statements in a programming language.
- 2. Consider the following fragment of C code.

```
int x = 2;
switch (x) {
   case 1: if (x >2)
   case 2: x++;
   default: break;
}
```

Explain whether or not the code is syntactically correct? If so, what is the value of x when the fragment has completed execution.

3. Consider the following function definition:

```
sum( x, y )
{
    return x+y;
}
```

Using the Hindley-Milner type-checking scheme, infer the type of *sum()* and its parameters.

- 4. Describe the different types of parameter passing mechanisms commonly found in programming languages, with one example of each.
- 5. Briefly describe the different techniques to reclaim storage in a programming environment.