

CIS 343 – Structure of Programming Languages
Homework Assignment #7, Winter 2019
Topic: Control Flow

Due: Friday, April 12, 2019

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1. A _____ is any observable change in memory, input, or output.
a) side impact ☒ b) side effect c) side kick
2. In _____ notation, operators appear to the left of their operands.
☒ a) prefix b) postfix c) infix
3. In _____ evaluation, the operands are evaluated first and then the operator is applied to them.
a) normal order ☒ b) applicative order
4. The _____ evaluation corresponds to a bottom-up evaluation of the values at the nodes of the syntax tree representing an expression.
☒ a) normal order b) applicative order
5. _____ evaluation of expressions is the most common in programming languages.
a) Normal order ☒ b) Applicative order
6. _____ evaluation of expressions is also known as non-strict or delayed evaluation.
a) Applicative order ☒ b) Normal order
7. In _____ evaluation of an expression, each operator begins its operation before its operands are evaluated, and each operand is evaluated only if it is needed for the calculation of the value of the operation.
☒ a) normal order b) applicative order
8. Short-circuit evaluation of Boolean expressions is a form of _____ evaluation.
a) strict ☒ b) delayed
9. Given the following two function definitions:

```
int dbl(int x) { return x + x; }
```

```
int sqr(int x) { return x * x; }
```

Evaluate the expression **sqr(dbl(sqr(2)))** using both applicative order evaluation and normal order evaluation. Also, indicate how many additions and multiplications are performed under each method.

Show your work on the back of this page.