Name _____

Student number _____

CS 2SC3 and SE 2S03 Fall 2008

Quiz 9 Answer Key

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You have 10 minutes to complete this quiz consisting of 2 pages and 5 questions. You may *not* use your notes and textbooks, nor may you use any calculators or other electronic devices. Circle the *best* answer for the multiple choice questions, and write the answer in the space provided for the other questions. Good luck!

(1) [2 pts.] In C, what is the type of the expression

```
malloc(sizeof(double))
```
?

(a) `double`.

(b) [`double *`.]

(c) `struct double`.

(d) [None of the above.]

(2) [2 pts.] Let $A = \{1, 2, 3\}$ and $B = \{0, 1, 3, 4\}$. How many elements are in the disjoint union of A and B?

(a) 3.

(b) 4.

(c) 5.

(d) [7.]

(3) [2 pts.] Which of the following OCaml types is *not* a type of lists?

(a) [`int * float * float * bool`.]

(b) `int list`.

(c) `(int -> int) array`.

(d) `string`.

(4) [2 pts.] In OCaml, write a sum type named `days` that represents the seven days of the week.

`Answer`:

```
type days =
  | Sunday
  | Monday
  | Tuesday
  | Wednesday
  | Thursday
  | Friday
  | Saturday ;;
```

(5) [2 pts.] Assume the following type definition has been made in OCaml:

```
type int_bin_tree =
  | Leaf of int
  | Branch of int_bin_tree * int_bin_tree ;;
```

Write an OCaml function named `f` of type

```
int_bin_tree -> int_bin_tree
```

that, given a tree T (of type `int_bin_tree`) as input, returns a tree T' (of type `int_bin_tree`) that is obtained from T by replacing each integer in T with the integer 17.

`Answer`:

```
let rec f = function
  | Leaf _ -> Leaf 17
  | Branch (x,y) -> Branch (f x, f y) ;;
```