Name _____

Student number _____

SE 2AA4 Winter 2007

Quiz 11 Answer Key

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You have 10 minutes to complete this quiz consisting of 2 pages and 4 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) [4 pts.] Which kind of MIS is usually the most suitable for a module that implements a data structure?

    (a) Relational input/output MIS.

    (b) Axiomatic input/output MIS.

    (c) Before/after MIS.

    (d) Trace MIS.

(2) [4 pts.] A state machine is *deterministic* if

    (a) It has a finite number of states.

    (b) It has a finite number of outputs.

    (c) Its initial state is fully specified.

    (d) Its output and next state relations are functions.

(3) [4 pts.] Fill in the blank. A specification of an abstract data type should follow the slogan

    no **junk**, *no* **confusion**.

Quiz continues on next page.   **1/2**

(4) [8 pts.] The following is a before/after specification of a procedure named `hamlet`.

    (a) `hamlet : int → int`.

    (b) Exceptions: none.

    (c) State constants: none.

    (d) State variables: `a, b : int` [initially $a = b = -1$].

    (e) Behavior rules:

Input $x : \texttt{int}$	Output $y : \texttt{int}$	State Transition	Exception
$x < 0$	$y = 0$	$a' = 0$ $b' = b$	
$0 \leq x$	$y = a + b$	$a' = 0$ $b' = a + b$	

Write a procedure in C that satisfies this specification.

Answer:

```c
int hamlet(int x) {
  if (x < 0) {
    a = 0;
    return 0;
  }
  else {
    int temp = a + b;
    a = 0;
    b = temp;
    return temp;
  }
}
```