

## C13-14

The problems in this problem set cover lectures **C13** and **C14**

1.
  - a. Define a **robust** algorithm to carry out integer division using repeated subtraction. Your algorithm accepts two integers and returns the quotient and the remainder. **Hint:** What are the preconditions and postconditions of your algorithm?
  - b. **Implement** your algorithm as an Ada95 program, using exception handling to provide robustness.

Turn in a hard copy of your algorithm and code listing, and an electronic copy of your code.

2.
  - a. What is the **cyclomatic complexity** of the code fragment shown below?

```
loop
  exit when Flag := True;

  if A < 100 and B > 200 then
    if A > 50 then
      Sum := Sum + 2;
    else
      Sum := Sum + 1;
    end if;
  else
    if B < 300 then
      Sum := Sum - 1;
    else
      Sum := Sum - 2;
    end if;
  end if;
end loop;
```

**Hint:** Draw the control flow graph

- b. What is the minimum number of test cases needed to test the fragment of code shown below? **Justify your answer.**

```
if A < 100 and B > 200 then
  if A > 50 then
    Sum := Sum + 2;
  else
    Sum := Sum + 1;
  end if;
else
  if B < 300 then
    Sum := Sum - 1;
  else
    Sum := Sum - 2;
  end if;
```

```
end if;
```