

1998 Paper 11 Question 2

Modula-3

The first half-dozen or so lines are missing from the program below. They include an `IMPORT` directive, a `TYPE` declaration and a `VAR` declaration. Suggest what the missing lines might be. [5 marks]

Describe how the program works, and give its resulting output. [15 marks]

```
PROCEDURE upk() =
  BEGIN
    k := k + 10
  END upk;

PROCEDURE jill() =
  BEGIN
    upk();
    k := k + 200
  END jill;

PROCEDURE jack (pr : MyProc; n : CARDINAL) =
  VAR
    a : CARDINAL;
  BEGIN
    a := 10*n;
    pr();
    IF n > 1000 THEN
      k := k + 1;
      jack (jill, n-1000);
      a := a + n
    END;
    k := k + a
  END jack;

BEGIN
  k := 0;
  jack (upk, 3000);
  IO.Put ("k = " & Fmt.Int(k) & "\n")
END UpkEtc.
```