

1994 Paper 1 Question 9

The Imperial system for Sterling currency was based on the *pound*, the *shilling* and the *penny*, with 12 pence per shilling and 20 shillings per pound. Define a Modula-3 record type to store an amount of money in pounds, shillings and pence. Allow for both positive and negative sums, and use sub-range types to restrict the values of fields in your data structure so that (for instance) the pence field always contains a number in the range 0 to 11. [4 marks]

Write procedures to convert an integer value in pence to the Imperial type you have just defined, and to convert from the Imperial type to text. The following examples illustrate aspects of the desired text corresponding to various numbers of pence. The library procedure `Fmt.Int` may be used to convert integer values to text.

```
0 → zero
1 → 1 penny
10 → 10 pence
60 → 5 shillings
80 → 6 shillings and 8 pence
252 → 1 pound and 1 shilling
479 → 1 pound, 19 shillings and 11 pence
1201 → 5 pounds and 1 penny
2400 → 10 pounds
-252 → minus 1 pound and 1 shilling
```

[16 marks]

Credit will be given for a clearly explained, concise and tidily presented solution. Minor syntax or punctuation errors in the Modula-3 code will not count heavily against you.