

## 1994 Paper 3 Question 10

### Structured Hardware Design

A subsystem consists of a microprocessor core, RAM, ROM and a sophisticated DMA engine (which effectively consists of counters and random logic), and is to be built into a wide variety of modules with various peripherals.

Describe the following implementations of the subsystem, considering the merit of each approach, in terms of design effort and cost effectiveness.

- (a) a single chip using full custom design [6 marks]
- (b) using semi-custom technologies [6 marks]
- (c) using field programmable logic and standard parts [6 marks]
- (d) using only standard parts [2 marks]