Computer Design

The way in which an instruction’s operands are specified is dependent on the type of internal storage in the processor. Processors which have no internal storage use memory.

(a) Describe the advantages of including some form of internal storage, such as an accumulator, in the processor. [5 marks]

(b) Describe three types of internal storage. In each case describe the format of an addition instruction. Indicate the presence of any implicit operands where necessary. [7 marks]

(c) Describe how data-forwarding improves performance in a pipelined load/store architecture (RISC). What common characteristic of programs often causes this performance improvement to be very significant? [8 marks]