



AS

COMPUTER SCIENCE

Paper 2

7516/2

Insert

**TABLE 1 for use in answering
Questions 9.1 and 9.2**

[Turn over]

TABLE 1 – standard AQA assembly language instruction set

LDR Rd, <memory ref>	Load the value stored in the memory location specified by <memory ref> into register d.
STR Rd, <memory ref>	Store the value that is in register d into the memory location specified by <memory ref>.
ADD Rd, Rn, <operand2>	Add the value specified in <operand2> to the value in register n and store the result in register d.

SUB Rd, Rn, <operand2>	Subtract the value specified by <operand2> from the value in register _n and store the result in register d.
MOV Rd, <operand2>	Copy the value specified by <operand2> into register d.
CMP Rn, <operand2>	Compare the value stored in register _n with the value specified by <operand2>.
B <label>	Always branch to the instruction at position <label> in the program.

TABLE 1 continues on the next page

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B<condition> <label>

Branch to the instruction at position <label> if the last comparison met the criterion specified by <condition>.

Possible values for <condition> and their meanings are:

EQ: equal to

NE: not equal to

GT: greater than

LT: less than

AND Rd, Rn, <operand2>	Perform a bitwise logical AND operation between the value in register r_n and the value specified by <operand2> and store the result in register d.
ORR Rd, Rn, <operand2>	Perform a bitwise logical OR operation between the value in register r_n and the value specified by <operand2> and store the result in register d.

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EOR Rd, Rn, <operand2>	Perform a bitwise logical XOR (exclusive or) operation between the value in register n and the value specified by <operand2> and store the result in register d.
MVN Rd, <operand2>	Perform a bitwise logical NOT operation on the value specified by <operand2> and store the result in register d.

LSL Rd, Rn, <operand2>	Logically shift left the value stored in register r_n by the number of bits specified by <operand2> and store the result in register r_d.
LSR Rd, Rn, <operand2>	Logically shift right the value stored in register r_n by the number of bits specified by <operand2> and store the result in register r_d.
HALT	Stops the execution of the program.

[Turn over]

LABELS: A label is placed in the code by writing an identifier followed by a colon (:). To refer to a label the identifier of the label is placed after the branch instruction.

INTERPRETATION OF <operand2>

<operand2> can be interpreted in two different ways, depending on whether the first character is a # or an R:

- **# – use the decimal value specified after the #, eg #25 means use the decimal value 25**
- **R_m – use the value stored in register _m, eg R₆ means use the value stored in register 6**

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The available general purpose registers that the programmer can use are numbered 0–12

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