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COMPUTER SCIENCE

Paper 2

7516/2

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TABLE 1 shows the standard AQA assembly language instruction set that should be used to answer question part **10.1**

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.

<p>B<condition> <label></p>	<p>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:</p> <p>EQ: equal to NE: not equal to GT: greater than LT: less than</p>
<p>AND Rd, Rn, <operand2></p>	<p>Perform a bitwise logical AND operation between the value in register n and the value specified by <operand2> and store the result in register d.</p>
<p>ORR Rd, Rn, <operand2></p>	<p>Perform a bitwise logical OR operation between the value in register n and the value specified by <operand2> and store the result in register d.</p>
<p>EOR Rd, Rn, <operand2></p>	<p>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.</p>
<p>MVN Rd, <operand2></p>	<p>Perform a bitwise logical NOT operation on the value specified by <operand2> and store the result in register d.</p>

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

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

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

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