A

AQA

A-level
COMPUTER SCIENCE

Paper 2

7517/2

Insert

TABLE 1 for use in answering Question 10

FIGURE 8 for use in answering Question 14.1

[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.**
`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**

[Turn over]

`AND Rd, Rn, <operand2>`	**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`.
`ORR Rd, Rn, <operand2>`	**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`.
`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** `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.**

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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.**

- `Rm` **– 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.

[Turn over]

FIGURE 8

LETTER	ENCODING
A	11000
B	10011
C	01110
D	10010
E	10000
F	10110
G	01011
H	00101
I	01100
J	11010
K	11110
L	01001
M	00111

LETTER	ENCODING
N	00110
O	00011
P	01101
Q	11101
R	01010
S	10100
T	00001
U	11100
V	01111
W	11001
X	10111
Y	10101
Z	10001

END OF SOURCE MATERIAL

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