

## Paper 1 Sample Questions

1

Colours are represented by a computer as a combination of the three primary colours: red, green and blue.

Numerical values are used to represent the different shades of each primary colour. These values range from 0 to 255 in decimal, or 00 to FF in hexadecimal.

(a) State why hexadecimal numbers are frequently used in computing.

[1]

(b) State the number of bits used to represent a non-primary colour, such as yellow.

[1]

(c) State the maximum number of colours that can be represented in a computer pixel.

[1]

2

Convert this hexadecimal number to denary/decimal (show your working):

A3

[2]

3

Complete the following truth table where:

$$X = A \text{ OR } B$$

$$Y = A \text{ NOR } C$$

$$Z = X \text{ AND } Y$$

| A | B | C | X | Y | Z |
|---|---|---|---|---|---|
| 0 | 0 | 0 |   |   |   |
| 0 | 0 | 1 |   |   |   |
| 0 | 1 | 0 |   |   |   |
|   |   |   |   |   |   |
|   |   |   |   |   |   |
|   |   |   |   |   |   |
|   |   |   |   |   |   |
|   |   |   |   |   |   |
|   |   |   |   |   |   |
|   |   |   |   |   |   |

[4]

4

Define the Boolean operator AND.

[2]

5

The Control Unit (CU) in a microprocessor (CPU) is responsible for decoding instructions and controlling other components of the CPU to make it work.

Which component is responsible for calculations and logic operations?

[1]

6

A keyboard is commonly used for inputting data into a computer system.

Identify another method of inputting data that can improve the accessibility of a computer system for some users.

[1]

7

Construct a trace table for the following algorithm.

```
K = 1
N = 1
M = 2
loop while K < 5
    output (N,M)
    K = K + 1
    N = N + 2
    M = M * 2
end loop
```

[5]

8

Outline one reason why accurate user documentation is necessary for a system.  
*Consider the command term outline. Give a reason and expand.*

[2]

NUMBERS is an array that holds only positive integers.

An algorithm is needed to copy each three-digit number from the array NUMBERS to the array three, only where the last digit is between 5 and 9 inclusive.

For example:

If NUMBERS = {9, 3456, 125, 237, 45679, 368, 293}

then the contents of the array, THREE, is:

|     |     |     |
|-----|-----|-----|
| 125 | 237 | 368 |
|-----|-----|-----|

If NUMBERS = {1234, 56, 90, 324, 870}

then the array THREE is empty and a message such as "No such numbers", should be outputted.

Construct this algorithm using pseudocode . You may assume that the array THREE is initialized with a sufficient number of elements.