

## Computing year 12 SL/HL - Half-yearly Test Feb 2021

ANSWER ALL QUESTIONS – ALL WORKING SHOULD BE SHOWN

- 1) Fill in: [3]

| Denary | Binary   | Hex |
|--------|----------|-----|
| 45     |          |     |
|        | 10110110 |     |
|        |          | 4B  |

- 2) Explain the functions of the control unit and the arithmetic logic unit within the CPU. [2]

- 3) What is the function of the RAM and ROM within the computer? [2]

- 4) What is the value of the following expression? [1]

$$(2=1+1) \text{ OR } (45>33) \text{ AND } (4=5-3)$$

- 5) In one byte express -33

a) In sign and magnitude [1]

b) In two's complement [1]

- 6) Perform, in one-byte numbers, the subtraction  $93 - 44$  by working in two's complement. [2]

- 7) Write a code fragment (NOT a whole program) where a user needs to enter a number between 1 and 5 (inclusive). If the user does not enter a number within the given range, the code will keep on asking the user for a number until a number in the given range is entered. [3]

- 8)

a) The formula for acceleration is  $a = (v-u)/t$  where 'a' is the acceleration, 'v' is the final velocity, 'u' is the initial velocity and 't' is time. Write a method called 'accel' where 'v', 'u', and 't' are given as parameters and the method returns 'a'. [3]

b) Write the 'main' method that asks the user to enter the values of 'v', 'u' and 't'. After that the method 'main' calls the method 'accel' and finally it displays the answer to the user. [3]

- 9)

a) Write a line of code that creates a one-dimensional array of 10 integer elements. [1]

b) Write code that finds the maximum number in the array. [2]

c) Write code that adds 3 with each element in the array. [2]

d) Write code that finds how many negative numbers are in the array. [2]