"3-a-day" A-Level Exam Practice Unit 2 (001)

Question 1

Algorithm 1:

```
position = 0
found = False
WHILE (position < length(array)) AND (found == False):
        IF search_item == array[counter]
                DISPLAY "Item at position" counter+1
                found = True
        ELSE:
                position = position + 1
```

Algorithm 2:

```
found = False
first = 0
last = lengthOfList – 1
WHILE found = False:
            midPoint = (first + last) DIV 2
            IF list[midpoint] == itemSought:
                    PRINT "item found at location", midpoint
                    found = True
                    BREAK
            ELSE:
                    IF first >= last:
                            PRINT "Failed"
                            BREAK
                    ELSE:
                            IF list[midpoint] > itemSought:
                                    last = midpoint - 1
                            ELSE:
                                    first = midpoint + 1
```

Name each of these algorithms?

Algorithm 1: _____

Algorithm 2: _____

Question 2

What is the Big-O notation of Algorithm 1? _____

What is the Big-O notation of Algorithm 2? _____

Question3

(c) A variable can be declared as global or local and is said to have scope.

   (i) Explain what is meant by the term 'variable'.

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   ....

   .... **[2]**

   (ii) Explain what is meant by 'scope' in relation to global and local variables.

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   ....

   .... **[2]**

Answer 1
Algorithm 1 = Linear (Serial) Search Algorithm 2 = Binary Search

Answer 2
Algorithm 1 = O(n) Algorithm 2 = O(Log n)

Answer 3

c	i		• Identifier/name of a … • Memory location used to store data	2	
	ii		• A range of statements/procedure/function/method that a variable is valid for • A local variable takes precedence over a global variable of the same name/allow the same identifier to be used for different purposes without conflict	2	Accept block of code