



GCSE



C500U20-1

THURSDAY, 16 MAY 2019 – AFTERNOON

COMPUTER SCIENCE – Component 2

Computational Thinking and Programming

2 hours plus your additional time allowance

ADDITIONAL MATERIALS

Your computer should be pre-installed with text editing software, a word processing package and a functional copy of version 2.4.2 of the Greenfoot IDE.

INSTRUCTIONS TO CANDIDATES

You will need to enter your answers to questions 1, 3, 4, 5, 6 and 7 within the electronic answer document provided.

You will need to create a new plain text file to answer question 2.

You will complete the work for question 8 within the Greenfoot IDE.

Carry out all tasks and make sure that you check your work carefully to ensure that the work you produce is accurate and correct.

Save your work regularly.

INFORMATION FOR CANDIDATES

The number of marks is given in brackets at the end of each question or part-question.

You are reminded of the need for good English and orderly, clear presentation in your answers.

The total number of marks available for this examination is 60.

Questions 3, 5, 6, 7 and 8 will require you to draw on your knowledge from multiple areas of your course of study.

4

- 1. State the HTML tags needed for each of the following: [3]**
 - (a) Centre align a section of text.**
 - (b) Setup the most important heading.**
 - (c) Indicate a section of text that is quoted from another source.**

Enter your answers in the electronic answer document.

2. A draft design for an HTML web page is shown below. [10]

Computer Science!

In this technological age, a study of computer science, and particularly how computers are used in the solution of a variety of problems, is essential.

**Learn about:
Programming
Algorithms
Assembler**

Click the link below to find out more:

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- 2. The design was then improved using various HTML tags to provide the formatting and content shown opposite.**

Copy the text from the electronic answer document into a basic text editor.

Insert the HTML tags that would be needed to display the content and formatting shown in the improved design.

The image file you require is called eduqas.jpg

The page title should be set to CompSci

Save your new web page as finalCompSci.txt

- 3. An assembly language program is required which can subtract one number from another.**

Write a program in assembly language to allow the user to input two numbers, store the two numbers in two declared variables, subtract one from the other, and output the resulting number. [9]

Enter your answer in the electronic answer document.

- 4(a) Describe what is meant by the term ALGORITHM. [2]**
- (b) Describe what is meant by the term ITERATION. [2]**
- (c) Describe what is meant by the term ROGUE VALUE. [1]**

Enter your answers in the electronic answer document.

```
1  dataList[8] is integer array
2  dataList = [1, 3, 21, 45, 57, 17, 34, 65]
3      {Populate the array}
4
5  Declare linearSearch(dataList,
    searchItem)
6      position is integer
7      found is Boolean
8      set position = 1
9      set found = FALSE
10
11  do while position < length(dataList)
    AND found = FALSE
12      if dataList[position] = searchItem
        then
13          found = TRUE
14      else
15          position = position + 1
16      end if
17  loop
18
19 End Subroutine
```

5. Opposite is an algorithm:

(a) From the algorithm opposite identify an example of: [5]

(i) selection

(ii) incrementation

(iii) assignment

(iv) declaration

(v) annotation

Enter your answers in the electronic answer document.

10

5(b) Complete the table given in the electronic answer document to show the values of the variable found for each of the given inputs. [4]

INPUT	found =
linearSearch(dataList, 2)	
linearSearch(dataList, 3)	
linearSearch(dataList, 54)	
linearSearch(dataList, 65)	

Complete the table in the electronic answer document.

```
1  set Pi = 3.142
2  radius is real
3  . . .
4
5  Declare FindArea
6    {procedure to calculate the
   area of a circle}
7
8  . . .
9
10 End Subroutine
11
12 startMainProg
13   output "Type in the radius"
14   . . .
15
16   call FindArea
17
18   output "The area is:"
19   . . .
20 endMainProg
```

- 6. An algorithm intended to calculate the area of a circle is shown opposite.**

The algorithm accepts a single input; the radius, and outputs the area.

The area of a circle is calculated by multiplying Pi by the radius squared.

Lines 3, 8, 14 and 19 are missing from the algorithm opposite.

Using four of the lines of code on page 12, complete this algorithm in the electronic answer document. [4]

12

- else is TRUE
- output area
- input radius
- input flag
- $\text{area} = \text{Pi} * \text{radius} * \text{radius}$
- End Subroutine
- area is real

- 7. Open the Greenfoot world WJECSnake7 and familiarise yourself with its contents.**

From the Greenfoot world WJECSnake7 identify an example of each of the following: [5]

- (a) superclass**
- (b) class**
- (c) private property**
- (d) parameter**
- (e) comment.**

Enter your answer in the electronic answer document.

- 8. Open the Greenfoot world WJECSnake8 and familiarise yourself with its contents. Complete the world as instructed below: [15]**
- (a) Populate the world with a snake, meerkat and at least two eggs.**
 - (b) Edit the meerkat and egg classes so that they turn and move at random.**
 - (c) Edit the snake code so that it moves at an appropriate speed in the direction of the arrow keys when pressed.**
 - (d) Edit the snake code so that it “eats” an egg when they collide (removes the egg from the world).**

- 8(e) Add a sound which will play every time the snake “eats” an egg.**
- (f) Add a counter. Edit the code so that the counter displays how many eggs have been “eaten” by the snake.**
- (g) Edit the code so that the counter loses a point (1 point is deducted) if the meerkat collides with the egg.**
- (h) Save your completed world as FinalSnake8**

