



GCSE

3500U20-1



S25-3500U20-1

TUESDAY, 20 MAY 2025 – AFTERNOON

COMPUTER SCIENCE

UNIT 2: Computational Thinking and Programming

2 hours

The decryption password for the encrypted media files is: radar-5d1fe

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ADDITIONAL MATERIALS

You will require the electronic answer document (EAD) for this examination and other files for certain questions, all of which should be pre-installed on your examination account.

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

INSTRUCTIONS TO CANDIDATES

You will need to enter your answers to certain questions within the electronic answer document provided.

You will need to create a new plain text file to answer question 1.

You will complete the work for certain questions within the Greenfoot IDE.

Carry out all tasks and save your work regularly.

INFORMATION FOR CANDIDATES

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

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.

1. This is a draft design for an HTML web page.
Copy the text below into a text editor.

[10]

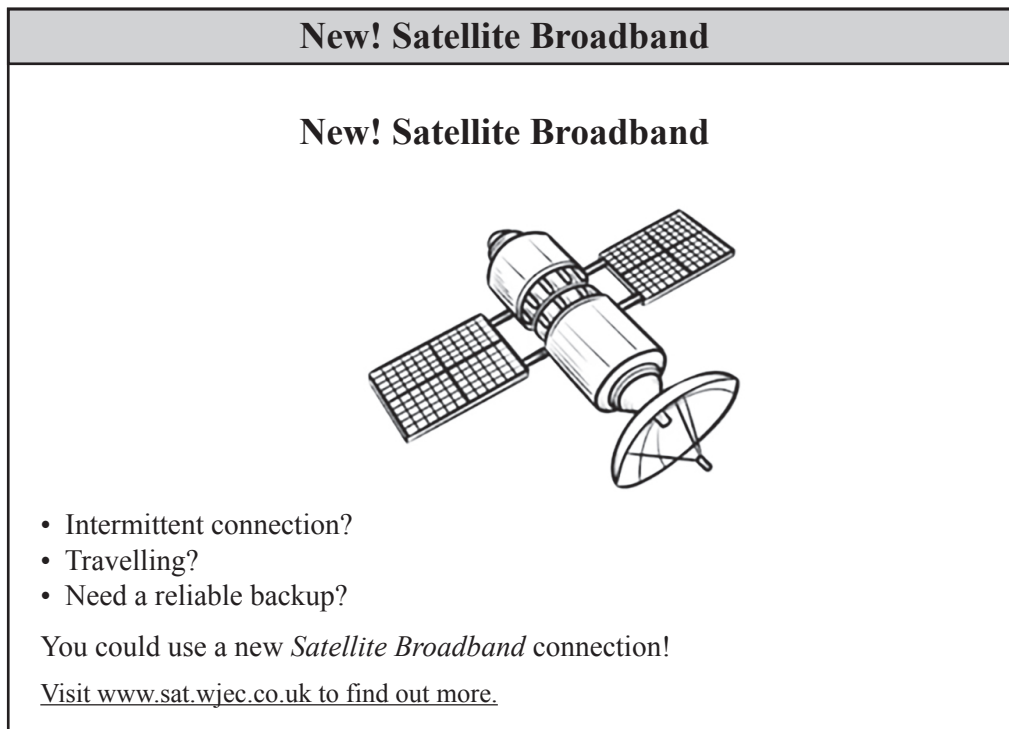
New! Satellite Broadband

Intermittent connection?
Travelling?
Need a reliable backup?

You could use a new Satellite Broadband connection!

Visit www.sat.wjec.co.uk to find out more.

The design was then improved to provide the formatting and content shown below.



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: sat.jpg

The page title should be set to: New! Satellite Broadband

Save your new web page as: FinalSat.txt

2. (a) A system for storing customer details uses variables.
Explain why certain variables are meaningful identifiers, and others are not.
Give examples. [4]
- (b) Describe **two** rules that a programmer could follow when choosing meaningful variable names. [4]
- (c) Describe the scope and lifetime of variables in algorithms and programs. [4]

Enter your answers into the electronic answer document.

3. Determine the outputs from the assembly language program when the inputs are **2** and **5**. [3]

```
INP
STA first
OUT
INP
STA second
OUT
SUB first
OUT
HLT
DAT first
DAT second
```

Enter your outputs from the program into the electronic answer document.

4. (a) This algorithm is used to calculate the price of a book order.

Using the inputs:

2
25
30

determine all the outputs of the algorithm.

[5]

```
noBooks is integer
currentPrice is real
totalPrice is real
meanPrice is real
discount is real
finalPrice is real

input noBooks

for i = 1 to noBooks
    input currentPrice
    totalPrice=totalPrice + currentPrice
next i

output "Total Price: £" + totalPrice
meanPrice= totalPrice / noBooks

output "Mean Price: £" + meanPrice

if totalPrice > 50 OR meanPrice > 10 then
    output "Discount Earned."
    discount = totalPrice/10
    finalPrice = totalPrice - discount
    output "Amount of discount: £" & discount
    output "Final price: £" & finalPrice
end if

end
```

Enter your outputs from the algorithm into the electronic answer document.

- (b) An algorithm is required to count the number of people that attend an event and provide some basic statistics.

The algorithm should:

- accept the inputs of the number of people entering the event
- stop counting when a rogue value (-1) is entered
- output the total number of people at the event.

An example of the **input** and output required is shown below.

Input: **5**

Input: **1**

Input: **3**

Input: **-1**

The total number attending is: **9**

Write an algorithm to meet these requirements.

[4]

Enter your algorithm into the electronic answer document.

5. A company would like a new scenario created in the Java programming language within the Greenfoot environment. The company will use the scenario as a screen saver providing a background behind a fish tank. [8]
- (a) Create a new world in the Greenfoot environment called **Sealife**. Set the background image within this world to a 9 × 9 grid using the image `water.jpg`
 - (b) Create a new class called **Fish** and set the image of this class to `fish.jpg`
 - (c) Populate the world with two **Fish**.
 - (d) Enter code into the **Fish** class which causes the **Fish** to only move left and right at random.
 - (e) Create a new class called **Jelly** and set the image of this class to `jelly.jpg`
 - (f) Populate the world with two **Jelly** fish.
 - (g) Enter code into the **Jelly** class which causes the **Jelly** fish to only move up and down at random.
 - (h) Save your completed world as `finalSealife`

All the images you require are in the `Sealife\images` folder.

6. Open the Greenfoot world `WJECSub6` and familiarise yourself with its contents.

[6]

From the Greenfoot world `WJECSub6` identify an example of:

- (a) a superclass of `Sea`
- (b) a superclass of `Counter`
- (c) a constructor method
- (d) an `int` type variable (integer storage)
- (e) an `int` type parameter
- (f) a call of a method from within a method.

Enter your answers in the electronic answer document.

7. Open the Greenfoot world `WJECSub7` and familiarise yourself with its contents. Complete the world as instructed below: [12]
- (a) Populate the world with a single **Sub**, two or more **Whirlpool** objects and two or more **Squid** objects.
 - (b) Edit the **Whirlpool** and **Squid** objects so that they turn and move **slowly** around the world at random.
 - (c) Edit the **Sub** object so that it moves at an appropriate speed in the direction of the arrow keys when pressed.
 - (d) Add a sound which will play every time the **Sub** “collides” with a **Squid** or a **Whirlpool**.
 - (e) Add a **counter** set to **100**. Edit the code so that the **counter** loses 10 points each time the **Sub** hits a **Squid** or a **Whirlpool**.
 - (f) Save your completed world as `FinalWJECSub7`



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