



GCSE

3500U20-1

TUESDAY, 21 MAY 2024 – AFTERNOON

COMPUTER SCIENCE

Unit 2: Computational Thinking and Programming

2 hours plus your additional time allowance

The decryption password for the encrypted media files is: flyer-cddc8

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 2.

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

Carry out all tasks and save your work regularly.

(Turn over)

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. Describe the effect of using the following tags on an HTML page. [8 marks]

(a) `<blockquote> We choose to go to the moon
- JFK </blockquote>`

(b) `
Send us an email `

(c) `<h3>Welcome</h3>`

(d) `<hr>`

Enter your answers in the electronic answer document.

2. This is a draft design for an HTML web page.

[10 marks]

Mesh Wi-Fi

Slow connection?

Poor ping time?

Dead zones between rooms?

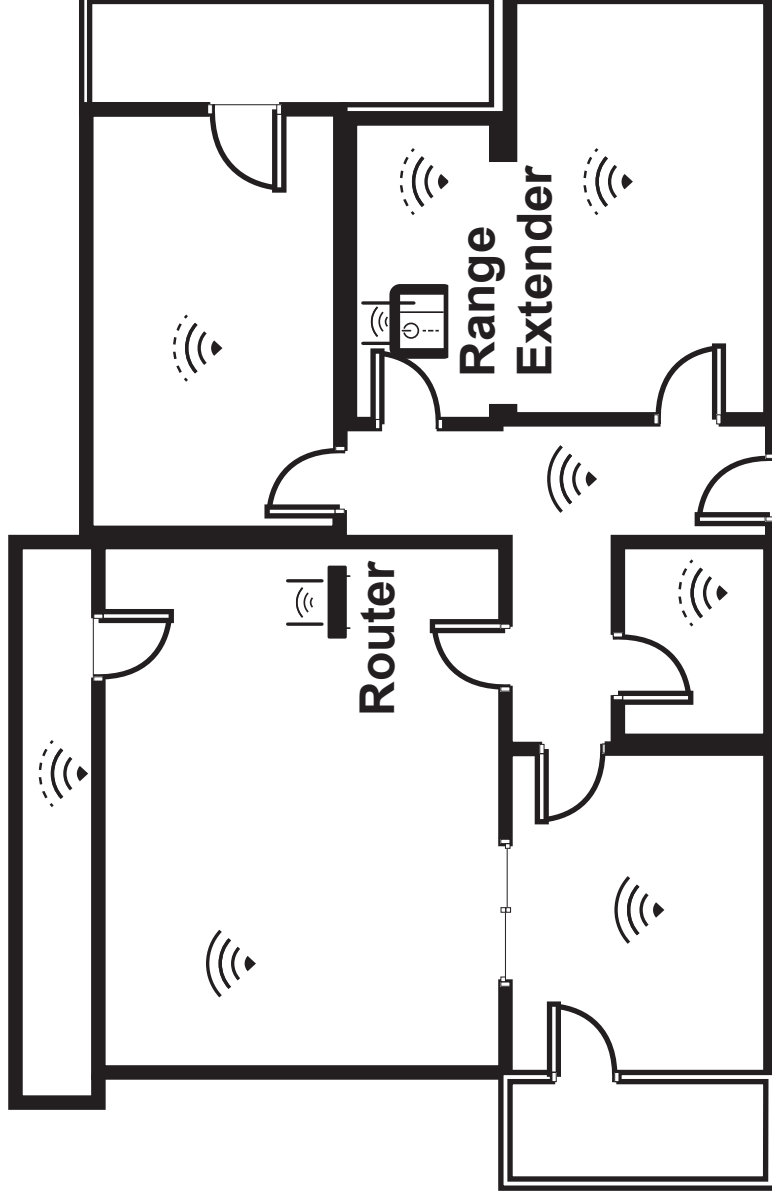
You need a new Mesh Wi-Fi router!

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

(Turn over)

New Mesh Wi-Fi

Mesh Wi-Fi



- Slow connection?
 - Poor ping time?
 - Dead zones between rooms?
- You need a new Mesh Wi-Fi router!**

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

2. The design was then improved 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: meshw.jpg

The page title should be set to: New! Mesh Wi-Fi

Save your new web page as: FinalWifi.txt

3 (a) State the meaning of the following assembly mnemonics: [4 marks]

(i) SUB

(ii) BRA

(iii) HLT

(iv) DAT

(b) State the assembly mnemonic needed to carry out the following operations: [4 marks]

(i) Input a value into a register.

(ii) Output to screen a value.

(iii) Store a value from a register into a memory area.

(iv) Load a value from a memory area into a register.

Enter your answers into the electronic answer document.

(Turn over)

3 (c) Write the outputs of the following assembly language program with the inputs of 1, 2, and 3 respectively. [5 marks]

**INP
STA first
OUT
INP
STA second
OUT
INP
STA third
OUT
ADD second
OUT
ADD first
OUT
HLT
DAT first
DAT second
DAT third**

Enter your outputs into the electronic answer document.

4. An algorithm is required which calculates the total distance of a bus journey with several stops. The algorithm accepts a number of integer inputs, decided by the user at run time, and adds them together.

The algorithm should:

- prompt the user to input how many stops there are
- accept the inputs of each distance between the stops
- output the total journey distance.

An example of the INPUT and output required is shown below.

Input how many stops: 5

Input distance: 4

Input distance: 2

Input distance: 5

Input distance: 1

Input distance: 3

The total distance is: 15

(Turn over)

4. **Write an algorithm to meet these requirements. Enter your algorithm into the electronic answer document. [6 marks]**

5. A Travel Company would like a new scenario created in the Java programming language within the Greenfoot environment. The travel company will use the scenario as a screen saver on a large screen TV. [5 marks]
- (a) Create a new world in the Greenfoot environment called **ADVERT**. Set the background image within this world to a 9 x 9 grid using the image `cell.jpg`
 - (b) Create a new class called **SUN** and set the image of this class to `sun.jpg`
 - (c) Populate the world with **TWO SUNS**.
 - (d) Enter code into the **SUN** class which causes the **SUNS** to turn and move randomly.
 - (e) Save your completed world as `finalAdvert`

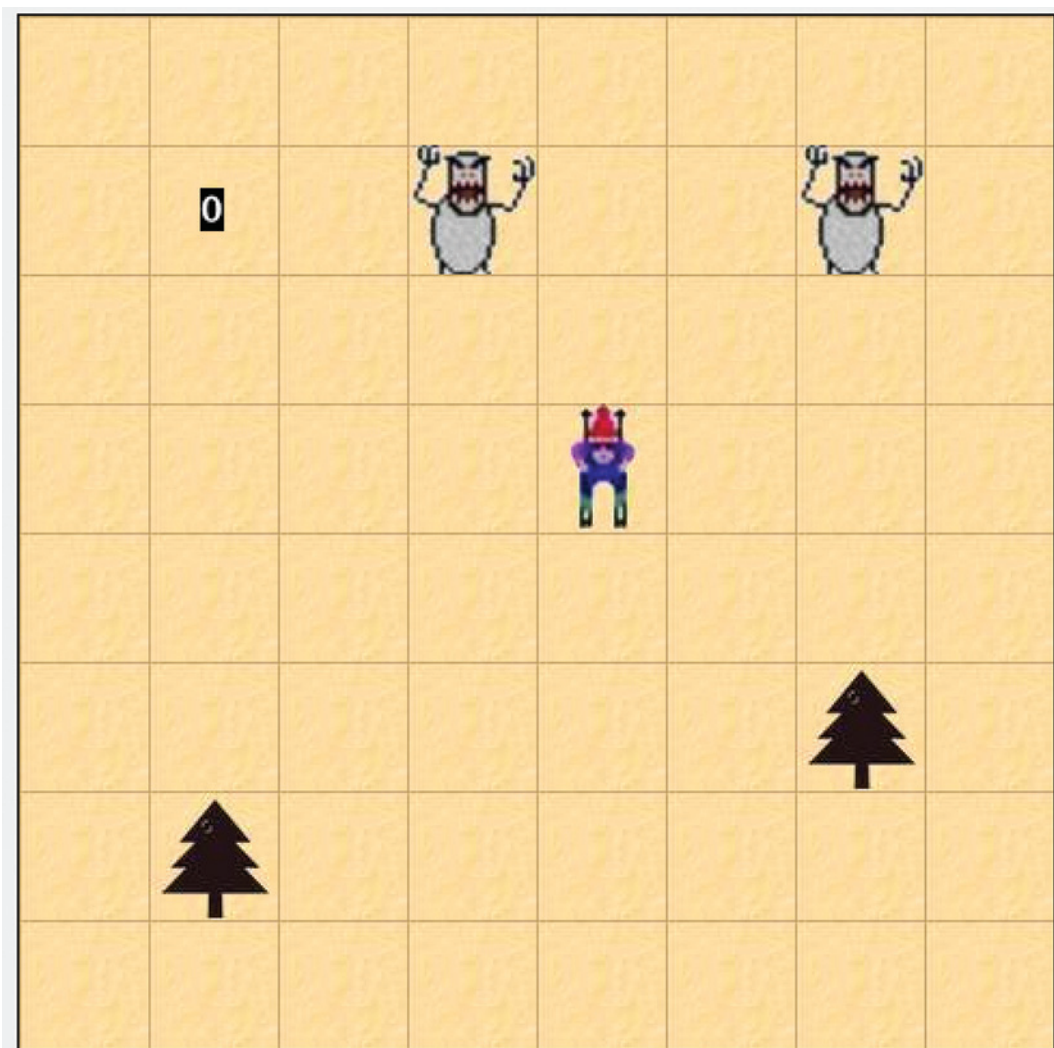
The images you require are in the `Advert\images` folder.

6. Open the Greenfoot world `WJECSki6` and familiarise yourself with its contents. [5 marks]

From the Greenfoot world `WJECSki6` identify an example of a:

- (a) private property.
- (b) class which inherits from `World`.
- (c) class which inherits from `Actor`.
- (d) method that accepts a property.
- (e) superclass.

Enter your answers in the electronic answer document.



7. **Open the Greenfoot world `wJECski7` and familiarise yourself with its contents. Complete the world as instructed below:**

[13 marks]

- (a) Populate the world with a single SKIER, two or more TREE objects and two or more SNOWMAN objects.**
- (b) Edit the SNOWMAN and TREE objects so that they turn and move around the world at random.**
- (c) Edit the SKIER object so that it moves at an appropriate speed in the direction of the arrow keys when pressed.**
- (d) Edit the SNOWMAN object so that it “catches the player” when it collides with a SKIER (removes the SKIER from the world).**
- (e) Add a sound, which will play every time the SKIER “collides” with a SNOWMAN.**

(Turn over)

- 7 (f) **Add a COUNTER. Edit the code so that the COUNTER gains 1 point for each TREE that the SNOWMAN has collided with.**

- (g) **Edit the code so that the COUNTER loses 10 points (ten points are deducted) if the SKIER collides with a SNOWMAN.**

- (h) **Save your completed world as `FinalWJECski7`**

END OF PAPER