GCSE

WJEC GCSE in COMPUTER SCIENCE

APPROVED BY QUALIFICATIONS WALES

SAMPLE ASSESSMENT MATERIALS

Teaching from 2017

This Qualifications Wales regulated qualification is not available to centres in England.

For teaching from 2017
For award from 2019

GCSE COMPUTER SCIENCE

SAMPLE ASSESSMENT MATERIALS

Contents

Candidate Name	Centre Number					Candidate Number				
						0				

GCSE

COMPUTER SCIENCE

UNIT 1

Understanding Computer Science

SAMPLE ASSESSMENT MATERIALS

1 hour 45 minutes

INSTRUCTIONS TO CANDIDATES

Use black ink or black ball-point pen. Do not use pencil or gel pen. Do not use correction fluid.

Write your name, centre number and candidate number in the spaces at the top of this page. Answer **all** questions.

Write your answers in the spaces provided in this booklet.

If you run out of space, use the continuation pages at the back of the booklet, taking care to number the question(s) correctly.

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 quality of your written communication, including appropriate use of punctuation and grammar, will be assessed in your answer to question 12.

The use of calculators is not permitted in this examination.

The total number of marks is 100.

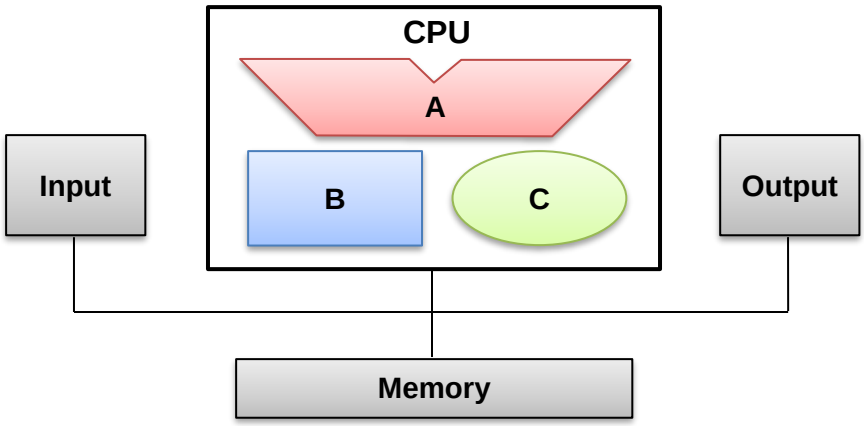
Questions 4 and 8d(i) and will require you to draw on your knowledge from multiple areas of your course of study.

1. High level languages are used by programmers.

Tick (✓) the correct boxes below to show whether the statements are TRUE or FALSE for a high level language. [3]

STATEMENT	TRUE	FALSE
They are easier to understand, learn and program as commands are similar to natural language.	1	2
They require less time for translation into machine code.	3	4
They are preferred when the execution speed is critical.	5	6

2. Below is a partially labelled diagram of a Von Neumann type architecture computer, with a single core Central Processing Unit (CPU).



(a) State the purpose of the components A, B and C above. [3]

Component A: .....

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Component B: .....

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Component C: .....

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(b) Cache size, clock speed and number of cores are the **three** main factors that affect performance. Describe how performance is affected by these **three** factors. [6]

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(c) Other hardware components are used in most computer systems.

Describe the role of each of the following.

(i) Sound card. [2]

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(ii) Motherboard. [2]

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3. Syntax errors are a type of programming error.

Giving specific examples, describe **two** other different types of programming errors.

[6]

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4. A partially complete data structure design, for storing customer details, is shown below.

Complete the table, suggesting:

- **Three most** suitable data types
- **Three different** methods of validation. [6]

Field name	Data type	Example data	Validation check
Customer ID		3	
First Name	String	Warren	Presence check
Surname	String	Davies	Presence check
Gender		M	Presence check
Date of birth	Date	28/11/1981	
Address	String	123 Western Avenue	Presence check
Post code	String	CF12 3AB	
Telephone number		029 2026 5137	Length check

5. Cyber security is essential in the protection against different types of malware.

(a) Describe **two** methods of protection against the use of key loggers. [4]

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(b) Describe **two** characteristics of a computer virus. [2]

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6. (a) Showing your workings, complete the table below, converting between denary, binary and hexadecimal numbers as necessary. [6]

Denary	Binary	Hexadecimal
104_{10}	01101000_2	68_{16}
	01001101_2	$4D_{16}$
28_{10}		$1C_{16}$
147_{10}	10010011_2	

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(b) (i) Showing your workings, add 01011101_2 and 00010011_2. [2]

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(ii) Using an example of binary addition, explain the concept of overflow. [4]

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(c) Perform arithmetic shifts on the numbers below and state the effect of each of these operations.

(i) Arithmetic shift left by one place on 01011110_2. [2]

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(ii) Arithmetic shift right by two places on 00111100_2. [2]

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7. Three resources managed by an operating system are output devices, the backing store and Central Processing Unit (CPU).

Describe the role of the operating system when managing **each** of these resources. [3]

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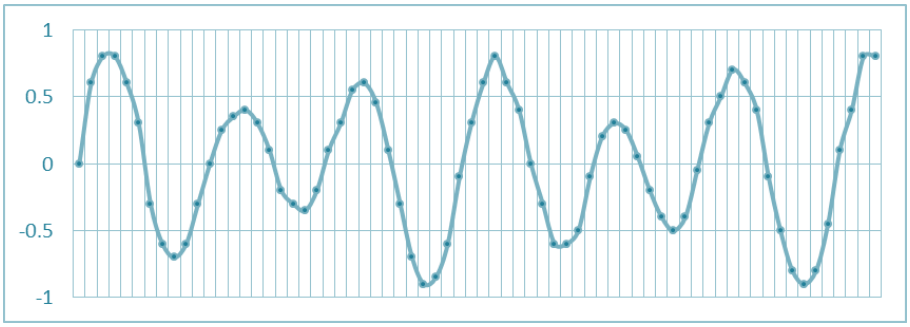
8. Sound sampling is used in the digital storage of sound.



(a) Explain the process of sound sampling. [3]

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(b) Describe how sound samples are stored. [2]

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(c) Give **two** examples of metadata stored in sound files. [2]

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(d) A lossy algorithm is used to compress a sound file whose original file size was 540 KB.

(i) Describe how a lossy algorithm would compress the sound file. [2]

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(ii) Following compression, the sound file size is reduced to 54 KB. Calculate the compression ratio. [2]

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9. TCP/IP is a protocol used for communication between computers when transmitting data over networks.

(a) Complete the diagram below, which shows the typical contents of a TCP/IP packet. [3]

……..……	The destination address
Reassembly data / packet order number	
Other tracking information	
……..……..	……..……..

(b) State the name of each layer in the TCP/IP 5-layer model. [5]

Layer 5: …..……

Layer 4: …..……

Layer 3: …..……

Layer 2: …..……

Layer 1: …..……

10. (a) (i) Complete the following truth table. [4]

$\boldsymbol{A}$	$\boldsymbol{B}$	$\overline{\boldsymbol{B}}$	$\boldsymbol{A}.\boldsymbol{B}$	$\boldsymbol{A}.\overline{\boldsymbol{B}}$	$\boldsymbol{B}+(\boldsymbol{A}.\overline{\boldsymbol{B}})$
1	1				
1	0				
0	1				
0	0				

(ii) Use this truth table to simplify the expression. [1]

$$\boldsymbol{B}+(\boldsymbol{A}.\overline{\boldsymbol{B}})$$

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(b) (i) Using the following identities:

$\boldsymbol{P}.\boldsymbol{1}=\boldsymbol{P}$

$\boldsymbol{P}.\boldsymbol{Q}+\boldsymbol{P}.\boldsymbol{R}=\boldsymbol{P}.(\boldsymbol{Q}+\boldsymbol{R})$

$\boldsymbol{P}+\overline{\boldsymbol{P}}=\boldsymbol{1}$

simplify the Boolean expression: [3]

$$X=A.B+A.\overline{B}$$

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(ii) Draw a truth table for the expression: [4]

$$X = A.B + A.\overline{B}$$

11. Explain how a domain name is used to access a web site using Domain Name System (DNS) servers. [6]

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12. A large organisation stores confidential data about its customers on its network.

Describe the dangers that can arise from the use of networks and discuss the importance of network security, giving suitable security preventions for the organisation. [10]

END OF PAPER

UNIT 1 - UNDERSTANDING COMPUTER SCIENCE

MARK SCHEME

Guidance for examiners

Positive marking

It should be remembered that learners are writing under examination conditions and credit should be given for what the learner writes, rather than adopting the approach of penalising him/her for any omissions. It should be possible for a very good response to achieve full marks and a very poor one to achieve zero marks. Marks should not be deducted for a less than perfect answer if it satisfies the criteria of the mark scheme.

For questions that are objective or points-based the mark scheme should be applied precisely. Marks should be awarded as indicated and no further subdivision made.

For band marked questions mark schemes are in two parts.

Part 1 is advice on the indicative content that suggests the range of computer science concepts, theory, issues and arguments which may be included in the learner's answers. These can be used to assess the quality of the learner's response.

Part 2 is an assessment grid advising bands and associated marks that should be given to responses which demonstrate the qualities needed in AO1, AO2 and AO3. Where a response is not credit worthy or not attempted it is indicated on the grid as mark band zero.

Banded mark schemes

Banded mark schemes are divided so that each band has a relevant descriptor. The descriptor for the band provides a description of the performance level for that band. Each band contains marks.

Examiners should first read and annotate a learner's answer to pick out the evidence that is being assessed in that question. Once the annotation is complete, the mark scheme can be applied.

This is done as a two stage process.

Stage 1 – Deciding on the band

When deciding on a band, the answer should be viewed holistically. Beginning at the lowest band, examiners should look at the learner's answer and check whether it matches the descriptor for that band. Examiners should look at the descriptor for that band and see if it matches the qualities shown in the learner's answer. If the descriptor at the lowest band is satisfied, examiners should move up to the next band and repeat this process for each band until the descriptor matches the answer.

If an answer covers different aspects of different bands within the mark scheme, a 'best fit' approach should be adopted to decide on the band and then the learner's response should be used to decide on the mark within the band. For instance if a response is mainly in band 2 but with a limited amount of band 3 content, the answer would be placed in band 2, but the mark awarded would be close to the top of band 2 as a result of the band 3 content. Examiners should not seek to mark candidates down as a result of small omissions in minor areas of an answer.

Stage 2 – Deciding on the mark

Once the band has been decided, examiners can then assign a mark. During standardising (marking conference), detailed advice from the Principal Examiner on the qualities of each mark band will be given. Examiners will then receive examples of answers in each mark band that have been awarded a mark by the Principal Examiner. Examiners should mark the examples and compare their marks with those of the Principal Examiner.

When marking, examiners can use these examples to decide whether a learner's response is of a superior, inferior or comparable standard to the example. Examiners are reminded of the need to revisit the answer as they apply the mark scheme in order to confirm that the band and the mark allocated is appropriate to the response provided.

Indicative content is also provided for banded mark schemes. Indicative content is not exhaustive, and any other valid points must be credited. In order to reach the highest bands of the mark scheme a learner need not cover all of the points mentioned in the indicative content but must meet the requirements of the highest mark band. Where a response is not creditworthy, that is contains nothing of any significance to the mark scheme, or where no response has been provided, no marks should be awarded.

Q	Answer	Marks	AO1	AO2	AO3	Total
1	**One mark for each correct response** • They are easier to understand, learn and program as commands are more similar to natural language - TRUE (box 1) • They require less time for translation into machine code - FALSE (box 4) • They are preferred when the execution speed is critical - FALSE (box 6)	1 1 1	1 1 1			3
2a	**One mark for each point** **No marks for naming component. Mark awarded for purpose of each. If purpose provided without naming component, award mark** • Component A: Arithmetic Logic Unit The ALU performs all the mathematical calculations and logical operations in the CPU. • Component B: Register Register is a storage location found on the CPU where data or control information is temporarily stored. (Registers are usually much faster to access than internal memory) • Component C: Control unit Directs the flow of instructions and/or data / Coordinates the other parts of the CPU / Generates clock ticks or controls the clock	1 1 1	1 1 1			3

Q	Answer	Marks	AO1	AO2	AO3	Total
2b	**One mark for each point** Cache size • More cache memory improves the performance as it can provide instructions and data to the CPU at a much faster rate than other system memory such as RAM. • More cache memory will allow more instructions that are repeatedly used by a CPU to be stored, and therefore increase the hit rate; increasing performance as a result. Clock speed • The faster the clock speed, the faster the computer is able to run the fetch-decode-execute cycle and therefore process more instructions. • The faster the clock speed, the more power is generally required which creates greater requirements for heat dissipation and can place more strain on battery life. Number of cores • In a single-core CPU each instruction is processed one after the other, whereas in a dual-core CPU, two instructions may be processed at the same time. In theory, dual-core CPU should mean that the computer can process instructions twice as fast as a single-core CPU. • Performance may be affected where one core is waiting on the result of another and therefore cannot carry out any more instructions, leading to the performance being no better than a single core processor.	1 1 1 1 1 1 1 1	1 1 1 1 1 1 1 1			6
2ci	**One mark for each point** • Sound cards are specialised electronic circuits designed to generate analogue waveforms from digital data • Sound cards provide the input and output of audio signals to and from a computer system.	1 1	1 1			2
2cii	**One mark for each point** • A motherboard provides connections between many of the components used by computer systems, • such as the CPU, memory, hard disc interface, expansion slots and other peripherals.	1 1	1 1			2

Q	Answer	Marks	AO1	AO2	AO3	Total

3	**Two marks for each description x 2**
	One mark for each example x 2
	
	<u>Logical error</u>
	• Description: A logical error is a mistake in the program instructing the program to do the wrong thing (1) so the program works but produces the wrong output (1)
	• Example: GrossPrice = NetPrice – VAT instead of GrossPrice = NetPrice + VAT
	
	Note: example must show both correct and incorrect code
	
	<u>Execution error</u>
	• Description: An execution error is when the program unexpectedly stops (1) as a result of an invalid operation during execution (1)
	• Example: Attempt to read past the end of file / attempt dividing by zero
	
	<u>Rounding error</u>
	• Description: A rounding error is when the program rounds a real number to a fixed number of decimal places (1) resulting in losing some information as the number becomes less accurate (1)
	• Example: 3.125 rounding to 3.13
	
	<u>Truncation error</u>
	• Description: A truncation error is when the program truncates a real number to a fixed number of decimal places (1) resulting in losing some information as the number becomes less accurate (1)
	• Example: 3.125 truncating to 3.12
	
	<u>Linking error</u>
	• Description: A linking error occurs when a compiler can't find the sub procedure (1) as the programmer might have declared it incorrectly / did not instruct the compiler to include the sub program (library) in the code. (1)
	• Example: `math.sqrt(4)` when the math library has not been included in the code
	or
	`declare FindLargst()`
	`Call FindLargest()`
	
	Accept other suitable examples of programming errors
	<u>NOT</u> syntax error as precluded by question.
		4
		2
			4
			2
						6

<table>
<tr><th>Q</th><th>Answer</th><th>Marks</th><th>AO1</th><th>AO2</th><th>AO3</th><th>Total</th></tr>
<tr><td>4</td><td>
One mark for each correct data type x 3
One mark for each suitable <u>different</u> validation check x 3
<table>
<tr><th>Field name</th><th>Data type</th><th>Example data</th><th>Validation check</th></tr>
<tr><td>Customer ID</td><td>Integer</td><td>3</td><td>Type check</td></tr>
<tr><td>First Name</td><td>String</td><td>Warren</td><td>Presence check</td></tr>
<tr><td>Surname</td><td>String</td><td>Davies</td><td>Presence check</td></tr>
<tr><td>Gender</td><td>Character</td><td>M</td><td>Presence check</td></tr>
<tr><td>Date of birth</td><td>Date</td><td>28/11/1981</td><td>Range check</td></tr>
<tr><td>Address</td><td>String</td><td>123 Western Avenue</td><td>Presence check</td></tr>
<tr><td>Post code</td><td>String</td><td>CF12 3DT</td><td>Format check</td></tr>
<tr><td>Telephone number</td><td>String</td><td>029 2026 5137</td><td>Length check</td></tr>
</table>
Alternative approach:
<table>
<tr><th>Field name</th><th>Data type</th><th>Example data</th><th>Validation check</th></tr>
<tr><td>Customer ID</td><td>Integer</td><td>3</td><td>Range check</td></tr>
<tr><td>First Name</td><td>String</td><td>Warren</td><td>Presence check</td></tr>
<tr><td>Surname</td><td>String</td><td>Davies</td><td>Presence check</td></tr>
<tr><td>Gender</td><td>Character</td><td>M</td><td>Presence check</td></tr>
<tr><td>Date of birth</td><td>Date</td><td>28/11/1981</td><td>Format check</td></tr>
<tr><td>Address</td><td>String</td><td>123 Western Avenue</td><td>Presence check</td></tr>
<tr><td>Post code</td><td>String</td><td>CF12 3DT</td><td>Type check</td></tr>
<tr><td>Telephone number</td><td>String</td><td>029 2026 5137</td><td>Length check</td></tr>
</table>
</td><td>3
3</td><td></td><td>3
3</td><td></td><td>6</td></tr>
</table>

5a	**One mark for each point** • Prevent physical access to the keyboard input port, e.g. USB (1), to eliminate the risk of pass through connectors, which captures the key presses (1). • Prevent the installation of device drivers or other low level software (kernel hacks) (1) which records input via the keyboard to a file (1). • Use a Bluetooth-enabled keyboard (1), in order to encrypt keystrokes during transit (1).	2 2 2	2 2 2			4

Q	Answer	Marks	AO1	AO2	AO3	Total
5b	**One mark for each point up to a maximum of two marks** • A computer program that copies itself from one to program to another on a computer system • Computer viruses need to attach themselves to an existing program • Viruses often infect computers by exploiting bugs / security failures in legitimate software.	2	2			2
6a	**One mark for correct workings x 3 (All valid methods accepted)** **One mark for correct conversion x 3** Denary / Binary / Hexadecimal 104_{10} / 01101000_2 / 68_{16} **77_{10}** / 01001101_2 / $4D_{16}$ 28_{10} / **00011100_2** / $1C_{16}$ 147_{10} / 10010011_2 / **93_{16}**	3 3		3 3		6
6bi	**One mark for correct workings** **One mark for correct answer** 01011101 00010011 Answer 01110000 *Carry 00111110*	1 1		1 1		2

6bii	**One mark for each:** • Choose two suitable binary numbers which, when added, will cause overflow • Correct addition of the two chosen binary numbers Worked example: 11000101 10110011 Answer 01111000 *Carry* ***1***00001110 • Identifying that a carry on the most significant bit (MSB) has occurred • CPU detects that a carry has occurred and sets the overflow flag to true.	1 1 1 1		1 1 1 1		4
6ci	**One mark for each:** 10111100_2 The effect is to multiply the number by 2.	1 1		1 1		2

Q	Answer	Marks	AO1	AO2	AO3	Total
6cii	**One mark for each:** 00001111_2 The effect is to divide the number by 4.	 1 1		 1 1		2
7	**One mark for each:** • The OS manages output devices by communicating with and sending data output from a printer, monitor or other valid output device. • The OS manages the backing store by ensuring that files and data can be stored and retrieved correctly by maintaining a filing system such as FAT or NTFS. • The OS manages the CPU by ensuring that programs are given sufficient time to execute instructions and that interrupts are handled by the CPU as necessary.	 1 1 1	 1 1 1			3
8a	**One mark for each:** • Sampling is a method of converting an analogue sound signal into a digital file. • At specific intervals (frequency) a measurement of the amplitude (bit depth) of the signal is taken. • The higher the sampling rate / bit depth the better the quality of the sound file	 1 1 1	 1 1 1			3
8b	**One mark for each:** • The amplitude of each sound sample is converted into the equivalent binary number. • The whole collection of data (binary numbers) is then stored in a digital file.	 1 1	 1 1			2
8c	**One mark for each up to a maximum of two:** • Artist • Title / Track Title • Product / Album Title • Track Number • Date Created / Year • Genre • Comments • Copyright • Software • Type • Duration • File size • Bit rate • Sampling rate • Channels • Volume	 1 1	 1 1			2
8di	**One mark for each:** • Sound files are compressed using a lossy algorithm by analysing the waveform and removing sound that cannot be heard by people. • To increase the compression, lossy algorithms remove more data which reduces the quality of the sound file (lowers fidelity)	 1 1		 1 1		2

Q	Answer	Marks	AO1	AO2	AO3	Total
8dii	**One mark for calculating compression, one for showing as a ratio:** $\boldsymbol{Compression\ ratio = \frac{Original\ file\ size}{Compressed\ file\ size}}$ $\boldsymbol{Compression\ ratio = \frac{540\ KB}{54\ KB}}$ $\boldsymbol{Compression\ ratio = \frac{10\ KB}{1\ KB} = 10:1}$	 1 1		 1 1		2
9a	**One mark for each:** • The source address • The data itself • Error checking data / checksum	 1 1 1	 1 1 1			3
9b	**One mark for each correct layer in correct position:** • Layer 5 - Process and application layer • Layer 4 - Transport layer • Layer 3 - Internet layer • Layer 2 - Data link layer • Layer 1 - Physical layer	 1 1 1 1 1	 1 1 1 1 1			5

<table>
<tr><th>Q</th><th>Answer</th><th>Marks</th><th>AO1</th><th>AO2</th><th>AO3</th><th>Total</th></tr>
<tr><td>10ai</td><td>One mark for each:

<table>
<tr><th>A</th><th>B</th><th>$\overline{B}$</th><th>$A.B$</th><th>$A.\overline{B}$</th><th>$B+(A.\overline{B})$</th></tr>
<tr><td>1</td><td>1</td><td>0</td><td>1</td><td>0</td><td>1</td></tr>
<tr><td>1</td><td>0</td><td>1</td><td>0</td><td>1</td><td>1</td></tr>
<tr><td>0</td><td>1</td><td>0</td><td>0</td><td>0</td><td>1</td></tr>
<tr><td>0</td><td>0</td><td>1</td><td>0</td><td>0</td><td>0</td></tr>
</table>

Marking
• $\overline{B}$ correct
• $A.B$ correct
• $A.\overline{B}$ correct
• $B+(A.\overline{B})$ correct</td><td>

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1
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1</td><td></td><td>

1
1
1
1</td><td></td><td>4</td></tr>
<tr><td>10aii</td><td>One mark for correct answer:
$A+B$</td><td>
1</td><td></td><td>
1</td><td></td><td>1</td></tr>
<tr><td>10bi</td><td>Three marks for correct answer otherwise one mark for each correct line of working out, up to a maximum of two:

$X=A.B+A.\overline{B}$
$X=A.(B+B)$
$X=A.(1)$
$X=A$</td><td>

1
1
1</td><td></td><td>

1
1
1</td><td></td><td>3</td></tr>
<tr><td>10bii</td><td>One mark for each correct row (table can contain more or fewer columns)

<table>
<tr><th>A</th><th>B</th><th>$A.B$</th><th>$\overline{B}$</th><th>$A.\overline{B}$</th><th>$A.B+A.\overline{B}$</th></tr>
<tr><td>1</td><td>1</td><td>1</td><td>0</td><td>0</td><td>1</td></tr>
<tr><td>1</td><td>0</td><td>0</td><td>1</td><td>1</td><td>1</td></tr>
<tr><td>0</td><td>1</td><td>0</td><td>0</td><td>0</td><td>0</td></tr>
<tr><td>0</td><td>0</td><td>0</td><td>1</td><td>0</td><td>0</td></tr>
</table></td><td>

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1</td><td></td><td>4</td></tr>
</table>

<table>
<tr><th>Q</th><th>Answer</th><th>Marks</th><th>AO1</th><th>AO2</th><th>AO3</th><th>Total</th></tr>
<tr><td>11</td><td>
Banded mark scheme
Indicative content

A DNS server will contain a list of domain names
A DNS server will contain a list of corresponding IP addresses
A web site address is typed into the address bar of a browser
The browser checks the local (cached) host file to check if it already holds the IP address
The local (your domain) DNS server is queried for the IP address
If the local DNS server does not hold the IP address then the query is passed to another DNS server at a higher level until the IP address is resolved
The address is passed on to DNS severs lower in the hierarchy
When the full address has been resolved, the IP address is then passed to your browser
The browser then connects to the IP address of the server and downloads the web site.

<table>
<tr><th>Band</th><th>AO1
(Max 6 marks)</th></tr>
<tr><td>2</td><td>4 - 6 marks
The candidate has:
shown clear understanding of the requirements of the question and a clear knowledge of the indicative content. Clear knowledge is defined as a response that provides four to six relevant detailed points from the indicative content
addressed the question appropriately explaining how a domain name is used to access a web site including the role of Domain Name System (DNS) servers with minimal repetition and no irrelevant material
used appropriate technical terminology referring to the indicative content accurately.</td></tr>
<tr><td>1</td><td>1 - 3 marks
The candidate has:
attempted to address the question and has demonstrated some knowledge of the topic specified in the indicative content. Some knowledge is defined as a response that provides one to three relevant points from the indicative content
addressed the question explaining how a domain name is used to access a web site including the role of Domain Name System (DNS) servers
used limited technical terminology referring to the indicative content.</td></tr>
<tr><td>0</td><td>0 marks
Response not credit worthy or not attempted.</td></tr>
</table>
</td><td>6</td><td>6</td><td></td><td></td><td>6</td></tr>
</table>

Q	Answer	Marks	AO1	AO2	AO3	Total
12	**Banded mark scheme** **Indicative content** <u>Dangers</u> • Hacking - gain unauthorised access to data/to a computer system. • Virus - a program which is capable of copying itself and typically has a detrimental effect, such as corrupting the system or destroying data. • Trojan - a program designed to breach the security of a computer system while ostensibly performing some innocuous function. • Worm - a standalone malware computer program that replicates itself in order to spread to other computers. • Spyware - software that enables a user to obtain information about another's computer activities by transmitting data from their hard drive. • Botnets - a network of private computers infected with malicious software and controlled as a group without the owners' knowledge, e.g. to send spam. • Malware - software which is specifically designed to disrupt or damage a computer system. • Keylogger - a computer program that records every keystroke made by a computer user, especially in order to gain fraudulent access to passwords and other confidential information. • Malicious damage - when a person intentionally sets out to corrupt or delete electronic files, data or software programs. • Accidental damage - when a person unintentionally corrupts or deletes electronic files, data or software programs.	10		10		10

Q	Answer	Marks	AO1	AO2	AO3	Total
12 (cont.)	<u>Preventions</u> • Unique username and a strong secure password - the organisation limits access to the network by ensuring that all authorised users have unique username and a strong secure password. • Access rights - access to confidential files on the network is limited to authorised users only by assigning access rights to users that only allow certain users to access specified area of the network and/or specified files. • Encryption - hackers are prevented from reading the confidential files even they gain access to it by encrypting the files • Encryption – an encryption key is used and known only by the organisation • Firewall - the servers would be protected with firewall software blocking / checking all network traffic entering or leaving specified ports / stop programs accessing the internet • Antivirus software - file servers would be protected with antivirus software which regularly scans all files stored on them for possible infection by malware • Antivirus software - email server would be protected with antivirus software and all incoming emails would be scanned to see if attached files are infected • Antivirus software - workstations would be protected with antivirus software and all files from external media would be scanned before they're allowed to be accessed • Accounting or auditing software – all files accessed by a user are recorded in an activity log					

Band	AO2 (Max 10 marks)
3	**8 - 10 marks** The candidate has: • shown clear understanding of the requirements of the question and a clear knowledge of the indicative content. Clear knowledge is defined as a response that provides eight to ten relevant detailed points from the indicative content relating to **both** the dangers and the importance of network security with suitable security preventions, with a maximum of 5 marks for either aspect • addressed the question appropriately describing methods that the organisation can use to protect its data • produced writing which is very well structured using accurate grammar, punctuation and spelling • used appropriate technical terminology referring to the indicative content accurately
2	**4 - 7 marks** The candidate has: • shown adequate understanding of the requirements of the question and a satisfactory knowledge of the indicative content. Satisfactory knowledge is defined as a response that provides four to seven points from the indicative content relating to **both** the dangers and the importance of network security with suitable security preventions, with a maximum of 5 marks for either aspect • addressed the question describing methods that the organisation can use to protect its data • produced writing which is generally well structured using reasonably accurate grammar, punctuation and spelling • used appropriate technical terminology referring to the indicative content
1	**1 - 3 marks** The candidate has: • attempted to address the question but has demonstrated superficial knowledge of the indicative content. Superficial knowledge is defined as a response that provides one to three points from the indicative content relating to the dangers **and/or** the importance of network security with suitable security preventions • produced writing which shows some evidence of structure but with some errors in grammar, punctuation and spelling • used limited technical terminology referring to the indicative content
0	**0 marks** Response not credit worthy or not attempted.

TOTAL	100	52	48	0	100

Candidate Name	Centre Number					Candidate Number				
						0				

GCSE

COMPUTER SCIENCE

UNIT 2

Computational Thinking and Programming

SAMPLE ASSESSMENT MATERIALS

2 Hours

ADDITIONAL MATERIALS

You will require the electronic answer booklet for this examination and files for question 8, 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 a familiar version 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 booklet 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 5, 6, 7 and 8 will require you to draw on your knowledge from multiple areas of your course of study.

1. State the HTML tags needed for each of the following: [3]

(a) Italic text.

(b) Centre text.

(c) Horizontal Rule.

Enter your answers in the electronic answer document.

2. A first attempt at producing an HTML web page to advertise a fitness tracking wristband is shown below. [10]

My Fitness Tracker
Fitness tracking wearable technology!

Do you need to monitor:
your heart rate
your running speed
total calories burned

All of the above in a sturdy, sporty, and comfortable design. Displays time, steps, and other stats on your wristband. Wirelessly syncs with your mobile device using Bluetooth to upload to our tracking website!

Click the link below to find out more:

www.myfitnesstracker.co.uk

The web page was then improved using various HTML tags to provide the formatting and content shown below.

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 web page above.

Save your new web page as myfitnesstrackerFinal.txt

3. (a) Describe the main difference between local and global variables. [2]

(b) Explain why it is usually better practice to use local variables rather than global variables. [3]

Enter your answers in the electronic answer document.

4. Below is an assembly program written using Little Man Computer (LMC) mnemonics:

```
1   INP
2   STA FIRST
3   INP
4   ADD FIRST
5   OUT
6   HLT
```

State the purpose of the following lines of code in the assembly program above: [6]

(a) Line 1

(b) Line 2

(c) Line 3

(d) Line 4

(e) Line 5

(f) Line 6

Enter your answers in the electronic answer document.

5. Below is an incomplete algorithm which is intended to check the username and password entered by a user. The user has 3 attempts.

```
1   Declare Subroutine LoginScreen
2   username is string
3   password is string
4   counter is integer
5   flag is boolean
6   set flag = false
7   set counter = 0
8   repeat
9    output "Type in username"
10   ……
11   ……
12   input password
13   ……
14    output "Username and password correct"
15    set flag = true
16   else
17    output "Username or password incorrect"
18   end if
19   set counter = counter + 1
20  …….
21  End Subroutine
```

Lines 10, 11, 13 and 20 are missing from the algorithm above. Using four of the lines of code below, complete this algorithm in the electronic answer document. [4]

- `else is true`
- `if username = "User1" AND password = "Pass1" then`
- `input username`
- `input flag`
- `until counter = 3`
- `if username = "User1" OR password = "Pass1" then`
- `output "Type in password"`

6. An algorithm is required to calculate the total, average, highest and lowest value of a set of positive integers.

The algorithm needs to:

- input the number of integers to be used
- input the value of each integer
- output the total of all the integers
- output the average of all the integers
- output the highest integer
- output the lowest integer

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

Please enter the number of integers: ***3***

Enter integer: ***4***

Enter integer: ***3***

Enter integer: ***5***

Total: 12

Average: 4

Highest: 5

Lowest: 3

Write the required algorithm in the electronic answer document. [9]

7. Using your knowledge of how a bubble sort operates and of how a merge sort operates, demonstrate how the following data would be sorted using both methods, clearly describing each step:

9	5	10	2

Enter your answers in the electronic answer document. [8]

8. Open the Greenfoot world WJECAquarium and familiarise yourself with its contents.

(a) Populate the world with a **crab**, at least two **sharks** and at least two **fish**. [3]

(b) Edit the **fish** and **sharks** so that they turn and move randomly. [3]

(c) Edit the program code to make the **crab** move at an appropriate speed in the direction of the arrow keys when pressed. [2]

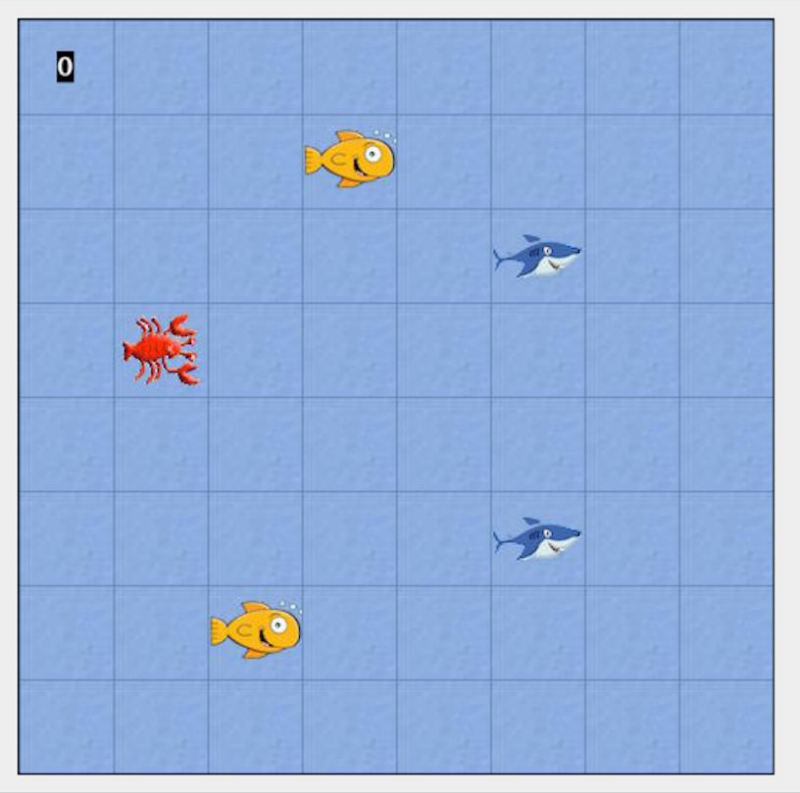
(d) Edit the **crab** so that it "eats" a **fish** when they collide (removes the **fish** from the world). [1]

(e) Add a sound which will play every time the **crab** "eats" a **fish**. [1]

(f) Add a **counter** and edit the code so that the **counter** displays how many **fish** have been "eaten" by the **crab**. [2]

(g) Edit the code so that the **counter** loses a point (1 point is deducted) if the **shark** "eats" a **fish**. [2]

(h) Save your completed world as FullAquarium [1]



UNIT 2 - COMPUTATIONAL THINKING AND PROGRAMMING

MARK SCHEME

Guidance for examiners

Positive marking

It should be remembered that learners are writing under examination conditions and credit should be given for what the learner writes, rather than adopting the approach of penalising him/her for any omissions. It should be possible for a very good response to achieve full marks and a very poor one to achieve zero marks. Marks should not be deducted for a less than perfect answer if it satisfies the criteria of the mark scheme.

For questions that are objective or points-based the mark scheme should be applied precisely. Marks should be awarded as indicated and no further subdivision made.

For band marked questions mark schemes are in two parts.

Part 1 is advice on the indicative content that suggests the range of computer science concepts, theory, issues and arguments which may be included in the learner's answers. These can be used to assess the quality of the learner's response.

Part 2 is an assessment grid advising bands and associated marks that should be given to responses which demonstrate the qualities needed in AO1, AO2 and AO3. Where a response is not credit worthy or not attempted it is indicated on the grid as mark band zero.

Banded mark schemes

Banded mark schemes are divided so that each band has a relevant descriptor. The descriptor for the band provides a description of the performance level for that band. Each band contains marks.

Examiners should first read and annotate a learner's answer to pick out the evidence that is being assessed in that question. Once the annotation is complete, the mark scheme can be applied.

This is done as a two stage process.

Stage 1 – Deciding on the band

When deciding on a band, the answer should be viewed holistically. Beginning at the lowest band, examiners should look at the learner's answer and check whether it matches the descriptor for that band. Examiners should look at the descriptor for that band and see if it matches the qualities shown in the learner's answer. If the descriptor at the lowest band is satisfied, examiners should move up to the next band and repeat this process for each band until the descriptor matches the answer.

If an answer covers different aspects of different bands within the mark scheme, a 'best fit' approach should be adopted to decide on the band and then the learner's response should be used to decide on the mark within the band. For instance if a response is mainly in band 2 but with a limited amount of band 3 content, the answer would be placed in band 2, but the mark awarded would be close to the top of band 2 as a result of the band 3 content. Examiners should not seek to mark candidates down as a result of small omissions in minor areas of an answer.

Stage 2 – Deciding on the mark

Once the band has been decided, examiners can then assign a mark. During standardising (marking conference), detailed advice from the Principal Examiner on the qualities of each mark band will be given. Examiners will then receive examples of answers in each mark band that have been awarded a mark by the Principal Examiner. Examiners should mark the examples and compare their marks with those of the Principal Examiner.

When marking, examiners can use these examples to decide whether a learner's response is of a superior, inferior or comparable standard to the example. Examiners are reminded of the need to revisit the answer as they apply the mark scheme in order to confirm that the band and the mark allocated is appropriate to the response provided.

Indicative content is also provided for banded mark schemes. Indicative content is not exhaustive, and any other valid points must be credited. In order to reach the highest bands of the mark scheme a learner need not cover all of the points mentioned in the indicative content but must meet the requirements of the highest mark band. Where a response is not creditworthy, that is contains nothing of any significance to the mark scheme, or where no response has been provided, no marks should be awarded.

Q	Answer	Mark	AO1	AO2	AO3	Total
1.	**One mark for each:**					
(a)		1	1			
(b)		1	1			
(c)	<hr>	1	1			
2.	**One mark for each correct <u>pair</u> in the correct location:** **i.e.** ** ** ** ** ** ** **Accept either or (No need to close p)** ** (Note http:// is required or the link will not work correctly on many devices)** **Accept alternative tags e.g. <big></big> instead of , etc** ** and count as a single item as both must be used together** **Accept alternative HTML (not CSS) solutions which work (only if the identical formatting would be achieved).**					
	<html> <head> <title> My Fitness Tracker Homepage </title> </head> <body> My Fitness Tracker Fitness tracking wearable technology! Do you need to monitor: - your heart rate - your running speed - total calories burned 	1 1 1 1(center) 1 (h1) 1 (need b i) 1 (need ul and li)		1 1 1 1 1 1 1		

Q	Answer	Mark	AO1	AO2	AO3	Total
	All of the above in a sturdy, sporty, and comfortable design. Displays time, steps, and other stats on your wristband. Wirelessly syncs with your mobile device using Bluetooth to upload to our tracking website! <hr> Click the link below to find out more: www.myfitnesstracker.co.uk </body> </html>	 1 (hr) 1 (a href) 1 (http://)		 1 1 1		
3(a)	**One mark for each:** Local variables are declared/used (accessible) within limited parts of a program/subroutine/function/ method. Whereas Global variables are declared/used (accessible) throughout the entire program.	 1 1	 1 1			
3(b)	**One mark for each:** It is better practice to use local variables whenever a variable is not needed throughout the entire program as it uses memory only when needed (OR: global variables use memory whenever the program is loaded whether the variable is needed or not) It is harder to debug errors involving global variables as global variables are liable to be changed within any subroutine, even if this was not initially planned. Subroutines are easier to use in other programs (improved reusability)	 1 1 1	 1 1 1			

Q	Answer	Mark	AO1	AO2	AO3	Total
4.	**One mark for each:** (a) Input a number (load into calculator/ accumulator) (b) Store the value in register (mailbox) FIRST (c) Input a second number (load into accumulator/calculator) replacing contents. (d) Add the contents of register/mailbox FIRST to the calculator/accumulator. (e) Output the value in the calculator/accumulator. (f) Halt / stop execution.	 1 1 1 1 1 1		 1 1 1 1 1 1		6
5.	1 Declare Subroutine LoginScreen 2 username is string 3 password is string 4 counter is integer 5 flag is boolean 6 set flag = false 7 set counter = 0 8 repeat 9 output “Type in username” 10 **input username** 11 **output “Type in password”** 12 input password 13 **if username = “User1” AND password = “Pass1” then** 14 output “Username and password correct” 15 set flag = true 16 else 17 output “Username or password incorrect” 18 end if 19 set counter = counter + 1 20 **until counter = 3** 21 End Subroutine	 1 1 1 1		 1 1 1 1		4
6.	**Brackets+Bold text indicate other accepted Pseudocode.** **Accept i,j,k for loops; accept any other meaningful variable name.** **Amendments to check for zero entered or divide by zero error (and any further validation) accepted not expected.** **Line numbers not necessary. Ignore indentation or lack of it.** **Accept alternative solutions as long as they provide exactly the same result.**					9

Q	Answer	Mark	AO1	AO2	AO3	Total
	Example Declare totalNos=0 Declare currentNo=0 Declare maxNo =0 Declare minNo=999 **(or any large number)** Declare total=0 Declare average as real=0 output "Please enter the number of integers:" input totalNos Repeat **(for i = 1 to totalNos)** output "Enter integer:" input currentNo if currentNo >maxNo then maxNo= currentNo endif if currentNo <minNo then minNo= currentNo endif total=total+ currentNo Until totalNos loops **(next for)** average=total/totalNos output "Total:" output total output "Average:" output average output "Highest:" output maxNo output "Lowest:" output minNo End **<u>Marks:</u>** Output Text Input value Repeat (concept of loop) Selection (comparison using if) Correctly adding (total=total+ currentnumber) Correctly calculating average (average=total/totaNo) Output a variable The solution provides one correct numerical output The solution provides all correct numerical outputs Alternatively, a flowchart matching above award full credit.	1 1 1 1 1 1 1 1 1			1 1 1 1 1 1 1 1 1	

Q	Answer	Mark	AO1	AO2	AO3	Total
7.	Overview of marking for bubble sort: **One mark** for applying knowledge of a swap being needed if data is out of order. **One mark** for applying knowledge of no swap being needed if data is in order and that the items are maintained in situ in the new list. (Accepted not expected: Bubble sort is stable.) **One mark** for applying knowledge of the need for additional passes through the data being required if any swaps were performed. **One mark** for applying knowledge that when no swaps are performed the data is in order as required and the sort has ended. Worked example of bubble sort: 9 | 5 | 10 | 2 The first two items are compared and as they are out of order they are swapped. - **1 mark.** **Result:** 5 | 9 | 10 | 2 The second and third items are compared and no swap is needed. - **1 mark.** **Result:** 5 | 9 | 10 | 2 The third and fourth items are compared and swapped. – mark already awarded above OR award mark here. **Result:** 5 | 9 | 2 | 10 The process starts again as there were swaps performed, however there is no need to include the last item in the process as this would be in the correct position – **1 mark.** **Result:** 5 | 9 | 2 | 10 The first and second position are compared and no swap is needed. – mark already awarded above OR award mark here. **Result:** 5 | 9 | 2 | 10			1 1 1 1		8

Q	Answer	Mark	AO1	AO2	AO3	Total
	The second and third items are compared and a swap is needed. – mark already awarded above OR award mark here. **Result:** | 5 | 2 | 9 | 10 | The process starts again as there were swaps performed, however there is no need to include the last two items in the process as these would be in the correct position. - mark already awarded above OR award mark here. **Result:** | 5 | 2 | 9 | 10 | The first and second items are compared and swapped. **Result:** | 2 | 5 | 9 | 10 | A final pass through would result in no swaps being made meaning the data is sorted resulting in the sort ending. – **1 mark.** **Result:** | 2 | 5 | 9 | 10 | Overview of marking for merge sort: **One mark** for applying knowledge of the need to divide the list into the smallest units (1 element). (Applying the concept of divide and conquer.) **One mark** for applying knowledge of the need to compare each element with the adjacent list to sort. **One mark** for applying knowledge of the need to merge the two adjacent lists. **One mark** for applying knowledge that when the lists are merged the data is in order as required and the sort has ended. Worked example of merge sort: | 9 | 5 | 10 | 2 | The list is divided into the smallest elements. - **1 mark.** **Result:** | 9 | 5 | | 10 | 2 | **Result:** | 9 | | 5 | | 10 | | 2 |			1 1 1 1		

Q	Answer	Mark	AO1	AO2	AO3	Total
	The first and second item are compared and placed in the correct order. - **1 mark.** The two adjacent elements are merged. - **1 mark.** **Result:** 5 | 9 10 2 The third and fourth items are compared, placed in the correct order and merged. – mark already awarded above OR award mark here. **Result:** 5 | 9 2 | 10 The process continues by sorting (comparing) and merging the remaining two adjacent lists. – mark already awarded above OR award mark here. **Result:** 2 | 5 | 9 | 10 When the last elements are merged together the data will have been sorted and the sort has ended. – **1 mark.** **Result:** 2 | 5 | 9 | 10					

Q	Answer	Mark	AO1	AO2	AO3	Total
8.	**One mark per bullet point below:**					15
(a)	World is pre-populated on load with: • one crab • two or more sharks • two or more fish.	 1 1 1			 1 1 1	
(b)	• fish move randomly around world. • sharks move randomly around world. • random movement implemented using a function (such as `getrandomnumber`)	1 1 1			1 1 1	
(c)	• crab moves around world according to arrow keys. • crab moves with appropriate relative speed to fish and sharks(equal to or greater than the speed of the fish and sharks)	1 1			1 1	
(d)	• fish is removed from world on collision with crab.	1			1	
(e)	• sound plays when crab and fish collide.	1			1	
(f)	• adding counter to world. • counter increases when crab and fish collide.	1 1			1 1	
(g)	• counter decreases when shark and crab collide. • implementation via parameter passing as opposed to wholly new method.	1 1			1 1	
(h)	• Greenfoot world saved correctly as FullAquarium	1			1	
	TOTAL	60	8	28	24	60

GCSE

COMPUTER SCIENCE

UNIT 3

Software Development Task

SAMPLE ASSESSMENT MATERIALS

20 Hours

INSTRUCTIONS TO CANDIDATES

You will have 20 hours to complete your task.

Read the Information and Task sheets carefully to make sure you understand what is needed.

It is important that you work independently from other candidates and make sure what you produce is your own unaided work.

Check your work carefully to make sure that the work you produce is accurate and correct.

INFORMATION FOR CANDIDATES

The quality of your written communication, including appropriate use of punctuation and grammar, will be assessed in your report on testing.

Teachers and candidates will be required to sign a declaration that all work presented is the work of the candidate alone.

Rafting Cymru

Introduction

Rafting Cymru is a white water rafting centre situated in North Wales. The centre has one of the first artificial white water rafting courses to be built in the UK. The manager of Rafting Cymru wants to see the course being well used and she has decided to set up an incentive scheme to encourage repeat bookings.

You have been employed to produce computerised systems for the new incentive scheme.

*All required information about Rafting Cymru and the new booking scheme is provided on the **Information Page.***

*The **Tasks Page** describes the work you need to carry out to complete the project and lists the content required for each section of the project.*

Information

Rafting Cymru is a white water rafting centre situated in North Wales. The centre has one of the first artificial white water rafting courses to be built in the UK.

As the water in the course is pumped, the water levels and speed can be controlled so that both experienced rafters and families can use the facility.

Rafts are designed to hold up to six people plus a qualified guide who steers the boat through the rapids. With the water level set at high the course provides thrills and spills for experienced rafters, at the lower setting the course is slower and smoother to suit beginners and family groups.

Family sessions are run at given times when the pumps will be slowed to provide a safer course.

Information on times and prices can be found on page 60.

The manager of Rafting Cymru wants to see the course well used and has designed an incentive scheme to encourage repeat bookings. She has decided to create the following discount offers:

- If a customer has booked a visit to the centre three times, then their fourth booking will be at half price.
- If the first three bookings are for six people each time, the fourth booking will be free.

Examples of discounts can be found on page 60.

Your task is to write an application that will allow the manager to:

- input and store customer details
- input and store customer booking details
- check if a customer can have a discount
- calculate and store the cost of the booking
- display customer and booking details.

To produce the application, you should:

- analyse the given information
- design a solution to the given problem
- program the solution to the given problem
- test and refine the application, noting the refinements in your refinement log
- evaluate your application.

Produce a report that includes the sections of work included on the Tasks page. Your report should be about 2,000 words.

Tasks

Refinement log [5 marks]

Complete your refinement log as you work through the project.

A copy of the refinement log can be found on pages 61 to 64.

Complete your refinement log to show that you have:

- carried out the activities in the correct order
- recorded your progress in each session
- described any problems you have had in carrying out your work in each session
- justified any changes to the original design that have to be made because of problems encountered
- identified logical priorities for actions in the next session.

Make sure you have completed your refinement log every session.

Scope of the Problem [8 marks]

Read the information given in the scenario about *Rafting Cymru* and their requirements. Produce a document that:

- clearly summarises the purpose of the project
- identifies the data required to create the application
- identifies the processing to be carried out by the application
- identifies the required outputs from the application
- provides objectives for the project that are measurable and clearly identifies the tasks that the application must perform to solve the problem.

Make sure you have completed your refinement log.

Design [12 marks]

Produce a design for the application that includes:

- input and output facilities provided by the user interface
- suitable data structures to enable the application to carry out the required tasks
- proposals for validation rules to control data input and limit errors
- designs for input formats including features to aid data entry
- designs for outputs including the intended layout of reports to be generated by the application
- designs for authentication routines
- processing stages as algorithms using standard conventions such as pseudo code or flowcharts.

Make sure you have completed your refinement log.

Effectiveness of Solution [15 marks]

You need to make sure that the finished application:

- is functional and fulfils all the requirements of *Rafting Cymru*
- has an interface that is easy to use
- is modular and makes efficient use of resources
- has authentication routines
- is reliable and robust.

Make sure you have completed your refinement log.

Technical Quality [20 marks]

You need to make sure that you have written code which:

- is self-documenting and well structured
- uses a consistent style throughout including indentation and use of white space
- uses meaningful identifiers and appropriate constants
- uses local variables to minimise the use of global variables
- has validation routines and can handle errors such as division by zero
- has informed annotation to demonstrate your understanding of the solution.

Make sure you have completed your refinement log.

Test Strategy [8 marks] and Testing [8 marks]

You need to plan and carry out testing of your application. Remember to use your Refinement Log to identify problems solved in the development of your application. Produce a document for this section of the work that shows you have:

- considered your application when developing your test strategy
- provided a description of the test strategy in terms of tests and data to be used
- considered how the outcomes of your testing might identify areas for further development
- produced a detailed test plan
- designed appropriate test data
- followed your test plan in a logical and systematic way
- used a full range of test data
- presented your testing outcomes with detailed commentaries
- used accurate grammar, punctuation and spelling.

Make sure you have completed your refinement log.

Further Development [4 marks]

Produce a Further Development document which:

- considers the outcomes of the testing process in terms of how well the application meets the objectives set at the beginning of the project
- describes the good features of the application and identifies areas for further development
- provides detailed suggestions for specific extensions to the application.

Make sure you have completed your refinement log.

Examples of discounts

Customer Bookings

CustomerID	Date	People
ID001	10/08/2017	3
ID002	11/08/2017	6
ID001	09/09/2017	5
ID002	10/09/2017	6
ID001	16/09/2017	6
ID003	17/09/2017	1
ID002	20/09/2017	6

Customer ID001 has made 3 bookings, the first booking was for 3 people, the second was for 5 people and the third for 6 people. That means the next time Customer ID001 books, the visit will be at half price for each person.

If Customer ID001 books for 4 people the cost will be (4 x £40)/2 = £80.

Customer ID002 has made 3 bookings. Each booking was for 6 people and therefore the next visit will be free.

Times and prices

White Water Rafting

Cost - £40 per person

Age 12 years and older

Family White Water Rafting

Cost - £25 per person

Age 6 years and older

Times - Wednesday evening and Sunday morning.

GCSE

COMPUTER SCIENCE 20xx

Non-exam assessment - Software Development Task

Name of Candidate: **Candidate's Number:**

Name of Centre: **Centre Number:**

Refinement logbook	
Project title	
Start date	
End date:	

Session 1	
Date	
Length of session	
Progress made in this session	
Problems encountered with the project	
Changes made to original designs as a result of problems	
Action plan for next session	
Project plan status (on time, ahead of time, behind time)	
Action plan to manage time	

Session 2	
Date	
Length of session	
Progress made in this session	
Problems encountered with the project	
Changes made to original designs as a result of problems	
Action plan for next session	
Project plan status (on time, ahead of time, behind time)	
Action plan to manage time	

Session x	
Date	
Length of session	
Progress made in this session	
Problems encountered with the project	
Changes made to original designs as a result of problems	
Action plan for next session	
Project plan status (on time, ahead of time, behind time)	
Action plan to manage time	

NOTICE TO CANDIDATES
The work you submit for assessment must be your own. If you copy from someone else, allow another candidate to copy from you, or if you cheat in any other way, you may be disqualified from at least the subject concerned.

DECLARATION BY TEACHER	**DECLARATION BY CANDIDATE**
I confirm that the candidate's work was conducted under the conditions laid out by the specification. I have authenticated the candidate's work and am satisfied that to the best of my knowledge the work produced is solely that of the candidate. **Teacher's signature**: **Date**:	I have read and understood the **Notice to Candidates** (above). I have produced the attached work without assistance other than that which my teacher has explained is acceptable within the specification. **Candidate's signature:** . **Date**:

GCSE

COMPUTER SCIENCE 20xx

Non-exam assessment - Software Development Task

Name of Candidate: **Candidate's Number:**

Name of Centre: **Centre Number:**

Non-exam assessment				
CRITERIA	**Max. Mark**	**Centre Mark**	**Mod. Mark**	**CENTRE COMMENTS**
Scope of the Problem	**8**			
Design	**12**			
Refinement Log	**5**			
Effectiveness of Solution	**15**			
Technical Quality	**20**			
Test Strategy	**8**			
Testing	**8**			
Further Development	**4**			
Total				

TOTAL	**80**			

Non-exam assessment - Comments
To be completed by the supervisor during the NEA. Please indicate where help beyond normal supervisory guidance has been given and how this has affected the marks awarded.

List the sources of information used in developing the NEA.

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