



Subject: Computer Science

Exam Details - AQA GCSE Computer Science 8525

Monday 16th May 2022 - PM

Paper 1: Computational thinking and problem solving

- 80 marks
- 2 hour
- 50% overall qualification

Friday 27th May 2022 - PM

Paper 2: Computing concepts

- 90 marks
- 1 hour 45 minutes
- 50% overall qualification

Each exam is out of 90 marks, a mixture of multiple choice, short-mark questions, and long-mark questions (up to 12 marks)

Revision at Home - An array of resources have been put together to support your revision when you are not in school. All the PowerPoints, worksheets and support sheets that your teacher has used in your lessons right from your very first lesson in Year 10 is available for you to access on the [11B Computing Teams Class Materials](#) where a folder for each unit with content covering each topic can be found.

Don't forget to make sure that you use your GCSE Essential Knowledge Booklets to revise Key Terms!
Other useful revision sources that are recommended for the AQA Specification include:

Websites:

- www.educake.co.uk
- www.101computing.net
- www.senecalearning.com (it also has an app)
- www.computerscience.gcse.guru/
- www.bbc.co.uk/bitesize/examspecs/zkwsjhw
- studyrocket.co.uk/revision/gcse-computer-science-aqa

YouTube Channels:

- [Mr Brown GCSE Computer Science](#)
- [Craig'n'Dave](#)
- [Computing:Mr H Programming Paper 1 guidance](#)

Books:

- [ClearRevise AQA GCSE Computer Science 8525 - Clear Revise by PG Online](#)
- [Hodder AQA GCSE Computer Science, Second Edition](#)
- [PG Online AQA Computer Science 8525](#)
- [CGP GCSE Computer Science AQA Exam Practice Workbook: fully updated for the new exams in 2022](#)
- [CGP GCSE Computer Science AQA Revision Guide: fully updated for the new exams in 2022](#)

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Be Determined 

Be Brave 

Be Supportive 

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Achieving Excellence through a Values Driven Education

Key Information

Below is a break down of the Units and each topic that you must revise. Remember the Pre-release material published in February ruled nothing out for Computer Science so make sure that you revise all areas thoroughly – Unit 4 Data representation is the only unit that is covered on both papers so this should be a priority. Download the Unit 4 Data Representation.docx for additional practice questions.

Make sure that you download the Y11 Tips sheet to support your revision of exam question terminology, expectations for responses and general tips to ensure you cover all parts of the question and secure top marks.

Unit 1: Ethical impacts of computing

- Ethical, cultural and legal issues

Unit 2: Fundamentals of cybersecurity

- Cyber security threats
- Social engineering
- Malicious code
- Detection and prevention

Unit 3: Computer Architecture

- Boolean Logic (expressions, gates and truth tables)
- Application, utility and system software
- Systems architecture
- The CPU and the Fetch Decode Execute cycle
- Classification of programming Languages and Translators
- Memory
- Storage

Unit 4: Data representation

- Storage units and binary numbers
- Binary arithmetic, shifts and Hexadecimal
- Ascii and Unicode
- Images
- Sound
- Compression

Unit 5: Networks

- Wired and wireless networks
- Network topologies
- Network security
- Protocols and Layers

Unit 6: Databases

- Databases and relational Databases
- Structured Query Language (SQL)

Unit 1a and b: Programming Practical skills in Python

- String Handling, Casting, Selection, Iteration, Turtle, Routines/Procedures, Functions, Arrays, Dictionaries, Sorting Algorithms, Searching Algorithms, Writing to .txt files

Unit 2a: Computational thinking

- Algorithms, decomposition and abstraction, Determining the purpose of Algorithms, Validation and Verification, Errors and testing

Really useful information to support in the success of your GCSE Computer Science!

Useful websites and YouTube Channels:

Websites

www.educake.co.uk

www.101computing.net

www.senecalearning.com

www.computerscience.gcse.guru/

www.bbc.co.uk/bitesize/examspecs/zkwsjhw

studyrocket.co.uk/revision/gcse-computer-science-aqa

YouTube Channels

[Mr Brown GCSE Computer Science](#)

[Craig'n'Dave](#)

[Computing Mr H Programming Paper 1 guidance](#)

AQA GCSE Computer Science Command words:

Throughout the qualification in particular within the exam questions you will find various terminology used by AQA. Understanding the meaning of the language used will ensure that you cover all the necessary detail examiners are looking for in your answers. Below is a list of the language used and what you should consider when answering questions:

Calculate

Work out the value of something – if the question is worth more than 1 mark, the examiner will be looking to see your working out. Make sure that this is clear and you show each stage of your working.

Compare

Identify similarities and/or differences. In comparison questions the key is to make sure you give a balanced argument, aim to structure your answer so that one paragraph focuses on similarities and another focuses on differences.

Complete

Finish a task by adding to given information. For example you may be asked to complete an algorithm so that it performs a specific task.

Convert

Change data from one specified form to another – You may need to show your conversion method here in-particular if the question is worth more than 1 mark. E.g. Hex to decimal, Decimal to binary. Bytes to Kilobytes.

Define

Specify meaning – The examiner will be looking for the use of correct terminology when you are giving definitions so make sure you re-cap on key words for each topic.

Describe

Set out characteristics – use examples wherever possible to support your answer. E.g. Describe three types of digital security – this may be 6 marks, 3 for identifying three appropriate types of digital security and three for describing how they work.

Develop

Take forward or build upon given information – if you are asked to develop something before giving your answer or developing a solution ask yourself, is this the best solution? What will be the benefits of your developments – you may be required to justify realistic and sensible improvements or changes later on.

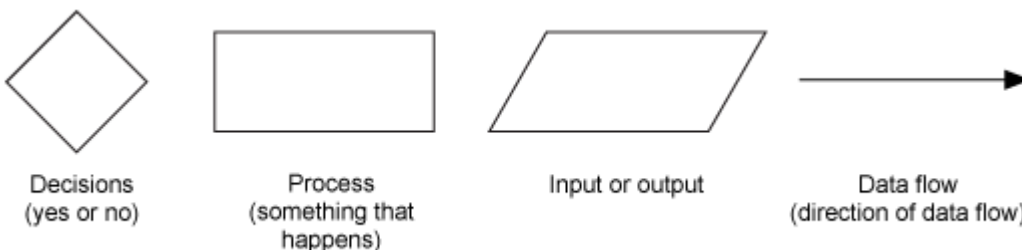
Discuss

Present key points – A discussion should always remain balanced. Make sure that you give equal advantages and disadvantages using examples to support your answers.

Draw

Produce a diagram – diagrams should be drawn using a pencil and annotated to ensure they are clear. It is common for examiners to ask you to produce a flow chart or logic gate diagram to reflect a process so make sure you revise symbols used: A few have been included below:

Flow chart symbols

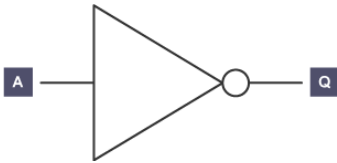


Logic Gate Symbols

NOT Gate Symbol:

A NOT gate has just one input. The output of the circuit will be the opposite of the input. If 0 is input, then the output is 1. If 1 is input, then 0 is output.

NOT Gate Symbol: triangle with a circle on the point, with one input (A) and one output (Q)



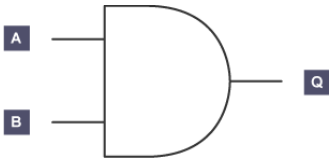
If A is the input and Q is the output, the truth table looks like this:

A	Q
1	0
0	1

The Boolean expression is written as $Q = \text{NOT } A$.

AND Gate Symbol:

An AND gate can be used on a gate with two inputs. AND tells us that both inputs have to be 1 in order for the output to be 1.



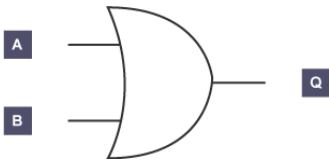
The truth table would look like this:

A	B	Q
0	0	0
0	1	0
1	0	0
1	1	1

The Boolean expression is written as $Q = A \text{ AND } B$.

OR Gate Symbol:

The OR gate has two inputs. One or both inputs must be 1 to output 1, otherwise it outputs 0.



The truth table would look like this:

A	B	Q
0	0	0
0	1	1
1	0	1
1	1	1

Explain

Set out purposes or reasons – Some questions may ask you to choose the better of two technologies for example and explain your answer. When explaining your answer you must make sure you give correct, sensible examples – Remember to compare your suggested examples to other alternatives and state why your chosen example would be more suitable.

Extend

Further develop based on existing information – You may be asked to extend an algorithm to perform a given function. Before attempting to do this make sure that you plan your answer and think carefully about your approach, ask yourself 1. What does it need to do, 2. What code will be needed to make this work, 3. 'Is this the most effective method of doing this?' and present your answer clearly.

Give/identify/State

These are usually 1 mark multiple choice questions and simple which you to state an answer without requiring an explanation. They usually test your understanding of key terminology. Check the number of marks to determine the level of detail you are required to give. NEVER leave these blank, even if you guess multiple choice usually give four options so you still have a 25% chance of getting it correct!

Justify

Support a case with evidence – In cases where you are asked to justify a point make sure that give realistic and clearly explained examples to support your opinion. Consider the impact on those involved and the environment.

Suggest

You may be asked to recommend a suitable solution for a problem e.g ‘Suggest a suitable network topology for Ann’s Pet Shop’. Make sure that you clearly explain what options are possible, the advantages and disadvantages with each and why your suggestion is the most effective.

Discuss

The last question on Paper two is often a 12 mark question – this is more marks than the difference between two whole grade boundaries from grade 2 and above!

Tips:

Identify the points/topics you want to cover in your answer – minimum three!

Keep it balanced, positive....negative...positive....negative... - minimum three of each

Details – What are you talking about? Why do you think its positive/negative? Impact – who or what does it impact and how?

CONTEXT – If you do not link your response back to the topic given in the question you cannot get above the bottom mark band! Highlight/circle/underline the context given in the question. If you are asked to discuss legal, environmental and ethical issues you should have a paragraph for each of these. If you are asked to discuss benefits of WiFi in a school your answer should talk about the benefits for people based in an education s

End of Unit 4 summary work sheet

Task 1: Binary conversions:

Convert the following Binary numbers in to denary: **(5 marks)**

a) 01001010	
b) 01001010	
c) 11100010	
d) 00011100	
e) 11100001	
f) 11010101	

Task 2: Binary Addition:

Add the following Binary numbers together. You must show your working out.
 Give your answer in Binary. **(5 marks)**

a) $01001001 + 11100101$	
b) $01001010 + 01011100$	
c) $11100010 + 00101001$	
d) $00011100 + 01101010$	
e) $11100001 + 01111101$	
f) $11010101 + 00101010$	

g) What is the effect of a left binary shift? **(1 mark)**

h) What is the effect of a right binary shift? **(1 mark)**

Task 3: Hex to Decimal:

Convert the following Hex numbers in to decimal: **(5 marks)**

a) 4C	
b) FF	
c) 8D	
d) 1A	
e) 77	
f) 56	

Task 4: Decimal to Hex:

Convert the following decimal numbers in to Hex: **(5 marks)**

a) 12	
b) 34	
c) 62	
d) 11	
e) 86	
f) 125	

Task 5: Hex to Binary:

Convert the following Hex numbers in to Binary: **(5 marks)**

a) 25	
b) CC	
c) D5	
d) 87	
e) E9	
f) BB	

Task 6: Character sets:

- a) How many bytes would be required to store the following string if it was recorded using 8 bit ASCII?
(1 mark)

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- b) Identify one advantage and one disadvantage of using Unicode to store a string: (1 mark)
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-

Task 7: Calculating Image Sizes

Define the following key terms: (4 marks)

a) Pixel	
b) Resolution	
c) Colour Depth	
d) Bit depth	

Calculate the size of the following images, you should give your final answer in bytes. Show your working.
(5 marks)

	Image	Working	Answer (Bytes)
a)	Resolution: 64 Bit depth: 8		
b)	Resolution: 326 Bit depth: 4		
c)	Hight: 32 pixels Width: 1024 pixels Bit depth: 16		
d)	Resolution: 1000 Colour depth: 64		
e)	Resolution: 456 Colour depth: 512		

Task 8: Calculating Sound Sizes

Define the following key terms: **(4 marks)**

a) Sample rate	
b) Resolution	
c) Bit Depth	
d) Channel	

Calculate the size of the following sound files, you should give your final answer in bits and Kilobytes. Show your working. **(5 marks)**

Image	Working	Answer (Bytes)	Answer (K)
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a)	Sample rate: 10 kHz Bit Depth: 10 Length: 30s Mono			
b)	Sample rate: 64 kHz Bit Depth: 8 Length: 60s Stereo			
c)	Sample rate: 10 kHz Resolution: 64 Length: 20s Mono			
d)	Sample rate: 128 kHz Resolution: 512 Length: 1m 20s Mono			
e)	Sample rate: 44,100 kHz Resolution: 512 Length: 10s Stereo			

Task 9: Compression

a) Identify a file format which would give **lossless** compression for an image and a sound file: **(2 marks)**

b) Identify a file format which would give **lossy** compression for an image and a sound file: **(2 marks)**

c) A row of pixels in an image reads 01100100100000111111
Encode this bit pattern using RLE methods: **(1 mark)**

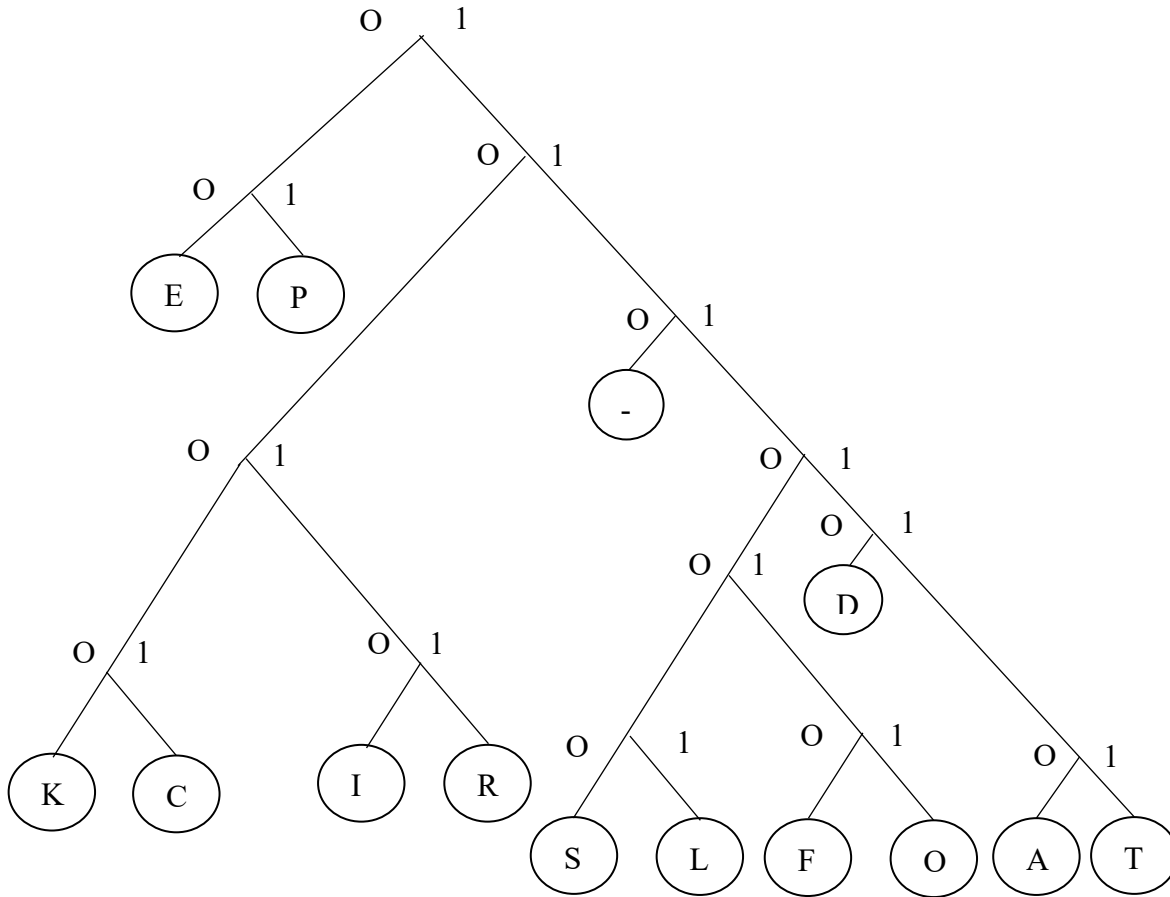
The following string is recorded in 8 bit ascii:

Peter Piper picked a peck of pickled peppers

d) How many bits are required to store the string? **(1 mark)**

e) Complete the table to show how many bits each letter requires looking at the Huffman Tree below:
(1 mark)

E	P	-	D	K	C	I	R	S	L	F	O	A	T



f) How many character is the string? **(1 mark)**

g) How many bits have been saved in total by using Huffman encoding? **(1 mark)**