**Computer Systems and Programming GCSE Computing examination**

**(1 hour 30 minutes)** Calculators **ARE** allowed in this exam

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|  | **Question 1 & 2** | **Question 3** | **Question 4** |
| **Focus** | Input / Output / storage devicesFiles typesCompression | Flow charts/algorithms and data types | Operating systems and utility programs and their use in security |
| **Duration** | 5 minute | 5 minutes | 15 minutes |
| **Marks available**  | 3 marks for a valid input device example, output device example and storage device example4 marks for recalling the best type of file for a given data format3 marks for recalling knowledge about compression | 10 marks for knowing your (python) data types, understanding and following a flowchart and interpreting the information it delivers and use it to complete a given task | 6 marks – knowledge recall on what methods OS/Utility programs provide a user with security |
| **A step by step guide to how to answer the question**  | 1. Knowledge recall
2. Some ideas for I/O revision are here: <http://www.bbc.co.uk/education/guides/zxb72hv/revision>
3. Be sure to expand your knowledge to include all types of electronic devices
4. Some file types exist here: <http://slis.simmons.edu/tor/01_01_01mgfiles.php>
5. Play with compression here:

<http://spaceplace.nasa.gov/data-compression/en/#/review/data-compression/compression.swf> | 1. Have an appreciation of what a flow chart is and how to use one. Remind yourself of the 3 shapes (rectangle, Diamond, Rectangle with rounded edges) and what they mean.
2. Do not get your understanding of “greater than” and “less than” symbols mixed up
3. Be able to perform simples maths
4. Calculators **ARE** allowed in this exam
5. Flowchart shapes explained:

<http://www.rff.com/flowchart_shapes.htm> | 1. Knowledge recall
2. Some ideas are found here:

<http://www.tutorialspoint.com/operating_system/os_security.htm> |
| **Top tips** | * Memory recall here
 | * Memory recall here
 | * Memory recall here
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|  | **Question 5** | **Question 6**  | **Question 7**  |
| **Focus** | High level **vs** low level **vs** machine code | Off the shelf softwareDatabases | CPU architecture Fetch-decode-execute cycle |
| **Duration** | 10 minutes | 10 minutes | 15 minutes |
| **Marks available**  | 4 marks for knowing what is meant by high level code and machine code1 mark for knowing the difference between an interpreter and a compiler6 marks for defining coding “standards” | 6 marks for knowing what are the parts that make up a database and why users use databases | 3 marks for knowing the F-D-E Cycle2 marks for a deeper understanding of the CPU6 marks for a mini essay discussing advancements in tablet memory  |
| **A step by step guide to how to answer the question**  | 1. You will need an understanding of High level **vs** low level **vs** machine code, what they are and why they are used
2. Some idea are explained here:
3. <http://www.bbc.co.uk/education/guides/zgmpr82/revision/2>
4. Coding standards is a term used to define best practice when coding.
5. Some coding standards can be found here:

<https://en.wikipedia.org/wiki/Coding_conventions>1. When you created your ceaser cipher python code, you made sure that your code met certain standards to allow a fellow programmer to use your code an improve it.
2. To answer this code, you must provide example of coding best practice and why these ideas are followed by good programmers
 | 1. Define what off-the-shelf software is and give an example
2. You must know the name for all the various structures in a database. A list of database structures can be found on the left hand side, here:

<http://www.teach-ict.com/gcse_new/databases/terminology/miniweb/index.htm>1. You must also be able to state how a database allows you to interact with the data that it holds. I.e. what are the reasons databases are used?

<http://www.bbc.co.uk/schools/gcsebitesize/ict/databases/2databasesrev4.shtml> | 1. You will need an understanding of the fetch-decode-execute cycle and the computer components that are included.
2. Refresh your memory here:

<http://www.teach-ict.com/gcse_computing/ocr/212_computing_hardware/cpu/miniweb/pg3.htm>1. You must have a solid understanding or RAM and HDD/SSD storage specifically to do with speed and increased capacity
2. Revision:

<http://www.tutorialspoint.com/computer_fundamentals/computer_memory.htm> |
| **Top tips** | * Memory recall here
 | * Memory recall here
 | * Memory recall here
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|  | **Question 8** | **Question 9** | **Question 10** |
| **Focus** | CPU instruction set |  NetworksIp addressMac address | Programming conceptAlgorithm/Psedocode |
| **Duration** | 5 minute | 5 minutes | 15 minutes |
| **Marks available**  | 2 marks for knowing what an opcode is2 marks for knowing what an operand is2 marks for binary to denary conversion1 mark for F-D-E cycle | 2 marks for LAN user monitoring4 marks for describing 2 differences between IP addresses and MAC addresses4 marks for describing what “failover” is | 1 mark for common sense2 marks for describing how a computer would react to a piece of code6 marks for writing an algorithm in pseudocde |
| **A step by step guide to how to answer the question**  | 1. Definitions of Opcode and Operand will be needed to be learned:

<http://www.bbc.co.uk/education/guides/z2342hv/revision/3>1. You will need to practice converting between binary and denary

<http://www.compedonline.org.uk/GCSEComputing/WebPages/A451_CompSys/214_RepOfData/Number/c/c.html>1. Refresh your memory of the F-D-E cycle here:

<http://www.teach-ict.com/gcse_computing/ocr/212_computing_hardware/cpu/miniweb/pg3.htm> | 1. LAN user monitoring is used in schools to make sure pupils do not use computers inappropriately. This is also exists in office networks.
2. What is an IP address –

<http://computer.howstuffworks.com/internet/basics/question549.htm>1. What is a MAC address –

<https://en.wikipedia.org/wiki/MAC_address>1. What is a failover –

<https://en.wikipedia.org/wiki/Failover> | 1. You must have an understanding of pseudocode

<http://gcsecs.weebly.com/pseudocode.html>1. You must have an understanding of For loops

<http://gcsecs.weebly.com/for-loop.html>1. You must use your knowledge of Python to be able to write a simple program
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| **Top tips** | * Memory recall here
 | * Memory recall here
 | * Use your basic ability to write small programs
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