GCSE Computer Science advanced information 2022

01 Computer Systems

OCR have released a list of topics to support students to focus their revision time. You should use the list below but should also consider revising other parts of the specification.

1.1 Systems architecture
- The purpose of the CPU
- Common CPU components and their features
- Von Neumann architecture

1.2 Memory and storage
- The need for primary memory
- The purpose of RAM and ROM and their differences
- Why computers need Virtual memory
- Why we need secondary storage
- Common types of storage: Optical, Magnetic and Solid state and their advantages and disadvantages
- Characteristics of storage devices
- The units of data storage Bit, Nibble, Byte, KB, MB, GB, TB and PB
- Representation of number, character, images and sound
- Compression: Lossy and Lossless

1.3 Computer networks, connections and protocols
- Factors that affect the performance of networks.
- The hardware needed computers into a LAN
- The Internet as a worldwide collection of computer networks
- Modes of connection
- Encryption
- IP addressing and MAC addressing
- Standards and common protocols

1.4 Network security
- Common prevention methods.

1.6 Ethical, legal, cultural and environmental impacts of digital technology
- Impacts of digital technology on wider society
- Legislation relevant to Computer Science

02 Algorithms and programming
OCR have not released any advanced information for this paper so all topics could be included in the exam.

2:1 Algorithms
- Computational thinking
- Designing, creating and refining algorithms in the form of flowcharts, pseudocode and OCR refence language
- Searching algorithms binary and linear
- Sorting algorithms bubble, merge and insertion

2.2 Programming fundamentals
- The use of variables, constants, operators, inputs, outputs and assignments
- The use of the three basic programming Sequence, Selection and Iteration
- The common arithmetic operators
- The common Boolean operators AND, OR and NOT
- Data types: String, Char, Float, Integer and Boolean
- String manipulation
- SQL
- Array
- Sub programs: Functions and procedures
- Random numbers

2.3 Robust programs
- Defensive design considerations: Anticipating misuse, Authentication and validation ¨
- Maintainability: Use of sub programs, Naming conventions, Indentation and Commenting
- Testing and types of tests
- Syntax and logic errors

2.4 Boolean Logic
- Logic diagrams using the operators AND, OR and NOT
- Truth tables

2.5 Programming languages and Integrated Development Environments
- High level vs. Machine code (Low level)
- Translators: Compiler, Interpreter and assembler
- Tools and facilities for an IDE

Helpful tool: For this paper you must be able to write algorithms. You should either write in Python or OCR reference language. Use this link to assist with OCR reference language