Computer Science GCSE Mock Exam 2022. DRAFT 1 – updates may apply before half term

Exam Board	AQA
Mock Exam Date	Thursday November 3rd 1.30pm
Mock Exam Duration	1.5 hours

You will find questions from both exam papers in the mock:

Section 1 represents topics from paper 1 – Computational Thinking and Problem Solving

Section 2 represents topics from paper 2 – Written Assessment

Key Revision resources:

1. Revision question booklets
2. Revision websites – Isaac Computing Website, BBC Bitesize (AQA for both/GCSE)
3. Past Papers – see AQA GCSE computer science/assessment
4. Algorithm Challenge booklet (as used in class)

Topics for Paper 1: Computational Thinking and Problem Solving

Topic	Specification Detail/general detail
1. Computational Thinking and Computing Terminology	Abstraction Data Validation Decomposition Efficiency Random number generation Variable assignment Spec point 1.1
2. Data Types	2.1 data types Understand and use the following appropriately: - integer - real - boolean - character - string
3. Constants and Variables	The three combining principles (sequence, iteration/repetition and selection/choice) are basic to all imperative programming languages. Students should know why named constants and variables are used.

4. Using a trace table	Find practical examples to trace through the values of a variable as an algorithm progresses.
5. Using subroutines and a structured approach	Students should be able to describe the structured approach including modularised programming, clear, well documented interfaces (local variables, parameters) and return values. Teachers should be aware that the terms 'arguments' and 'parameters' are sometimes used but in examinable material we will use the term 'parameter' to refer to both of these.
6. Using linear search and binary search, + comparison	1.4 sorting algorithms

Topics for Paper 2:

	Topic	Specification Detail/general detail
1.	Binary numbers: conversion to/from decimal	Students must be able to represent decimal values between 0 and 255 in binary.
2.	Hexadecimal numbers – converting to and from binary+decimal	Be able to convert in both directions between: - binary and decimal - binary and hexadecimal - hexadecimal and decimal Understand how hexadecimal can be used to represent whole numbers. Students must be able to represent decimal values between 0 and 255 in hexadecimal.
3.	Binary shift, binary addition	Students will be expected to use a maximum of 8 bits and a maximum of 3 values to add. Answers will be a maximum of 8 bits in length and will not involve carrying beyond the eight bits. Binary shifts can be used to perform simple multiplication/division by powers of 2.
4.	File Size calculation, sound samples, sample rate	Understand that a sample is a measure of amplitude at a point in time. Sampling rate is the number of samples taken in a second and is usually measured in hertz (1 Hertz = 1 sample per second). Sample resolution is the number of bits per sample. File size (bits) = rate x resolution x secs
5.	Operating systems,	Explain what is meant by: - system software - application software

application software	Give examples of both of these Understand the need for, and functions of, operating systems (OS) and utility programs. Understand that the OS handles management of the: - processor (s) - memory - I/O devices - applications - security
6. Memory and storage	Students should be able to explain the terms volatile and non-volatile. Secondary storage is considered to be any non-volatile storage mechanism external to the CPU.
7. Factors affecting the performance of the CPU	Explain the effect of the following on the performance of the CPU: - clock speed - number of processor cores - cache size - cache type
8. Logic Gates and application using truth tables	Construct truth tables for the following logic gates: - NOT - AND - OR
	Construct truth tables for simple logic circuits. Interpret the results of simple truth tables.
9. Embedded Systems	Students must be able to give examples of embedded and non-embedded systems.
10. Computer Networks – definition, security, MAC addresses, protocols	Explain the following methods of network security: - authentication - encryption - firewall - MAC address filtering Students should be able to name the layers and describe their main function(s) in a networking environment. Application layer: this is where the network applications, such as web browsers or email programs, operate. Transport layer: this layer sets up the communication between the two hosts and they agree settings such as 'language' and size of packets. Network layer: addresses and packages data for transmission. Routes the packets across the network.

	Data link layer: this is where the network hardware such as the NIC (network interface card) is located. OS device drivers also sit here. Describe the 4 layer TCP/IP model: - application layer - transport layer - network layer - data link layer Understand that the HTTP, HTTPS, SMTP, IMAP and FTP protocols operate at the application layer. Understand that the TCP and UDP protocols operate at the transport layer. Understand that the IP protocol operates at the network layer.
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