



Subject	OCR GCSE Computer Science	
Title/Topic	Format	Length
Paper 1 – Computer Systems	Written paper	1hr 15mins
Paper 2 – Algorithms and Programming	Written paper	1hr 15mins

In this mock exam I will be asked to show I can...

OCR J277 Component 1: Computer Systems

Paper 1- Checklist

1. Systems Architecture

Knowledge

- CPU architecture
- Registers
- Fetch-decode-execute cycle
- Embedded systems

Skills

- Explain the purpose of CPU registers
- Describe how instructions are processed
- Identify the role of embedded systems
- Interpret diagrams and descriptions of CPU operation

2. Memory and Storage

Knowledge

- Primary storage (RAM and ROM)
- Virtual memory
- Secondary storage devices
 - Magnetic
 - Optical
 - Solid-state
- Units of storage

Skills

- Compare different storage technologies
- Select suitable storage media for given scenarios
- Calculate storage capacities
- Explain advantages and disadvantages of storage devices



3. Computer Networks, Connections and Protocols

Knowledge

- LAN and WAN
- Wired and wireless networking
- Network topologies
- DNS
- IP addressing
- URLs
- Cloud storage

Skills

- Compare network types
- Compare network topologies
- Explain how devices communicate across networks
- Identify valid IP addresses
- Explain the purpose of DNS
- Evaluate cloud-based solutions
- Explain factors affecting network performance

4. Systems Software

Knowledge

- Operating systems
- Utility software

Skills

- Explain operating system functions
- Describe memory, file and peripheral management
- Explain the purpose of utility software
- Compare different utilities and their uses

5. Data Representation

Knowledge

- Binary
- Denary
- Hexadecimal
- Binary addition
- Binary shifts
- Character sets (ASCII and Unicode)
- Images
 - Pixels
 - Resolution
 - Colour depth



- Sound
 - Sampling
 - Sample rate
 - Bit depth

Skills

- Convert between denary, binary and hexadecimal
- Complete binary arithmetic
- Apply binary shifts
- Compare ASCII and Unicode
- Calculate image file sizes
- Calculate sound file sizes
- Explain factors affecting media quality

OCR J277 Component 2

Paper 2 - Checklist

1. Algorithms

Knowledge

- Characteristics of algorithms
- Algorithm design
- Flowcharts
- Pseudocode
- Trace tables
- Testing strategies
- Searching algorithms
- Sorting algorithms

Skills

- Create and interpret flowcharts
- Create and interpret pseudocode
- Complete and analyse trace tables
- Identify and apply normal, boundary and erroneous test data
- Trace and predict algorithm outputs
- Explain how algorithms solve problems
- Refine and correct algorithms

Algorithms to Revise

- Linear search
- Bubble sort
- Insertion sort
- Merge sort



2. Programming Fundamentals

Knowledge

- Variables and constants
- Identifiers
- Data types
- Input and output
- Arithmetic operators
- Relational operators
- Boolean operators
- Assignment statements

Skills

- Declare and use variables
- Select appropriate data types
- Write expressions using operators
- Use Boolean logic correctly
- Validate input data
- Create and evaluate conditions

3. Programming Constructs

Knowledge

- Sequence
- Selection
- Iteration

Skills

- Write conditional statements
- Use nested selection
- Create count-controlled loops
- Create condition-controlled loops
- Determine when different loop structures should be used
- Trace the execution of loops
- Predict program outcomes

4. Data Structures

Knowledge

- Arrays
- One-dimensional arrays
- Array indexing

Skills

- Store data in arrays
- Access values using indexes



- Loop through arrays
- Update array contents
- Process all elements in an array

5. Computational Thinking

Knowledge

- Abstraction
- Decomposition
- Algorithmic thinking

Skills

- Apply abstraction to problem solving
- Break complex problems into smaller tasks
- Design step-by-step solutions
- Identify examples of computational thinking techniques

6. Producing Robust Programs

Knowledge

- Validation
- Verification
- Defensive design
- Input checking

Skills

- Validate user input
- Design checks against invalid data
- Create algorithms that meet multiple conditions
- Test solutions using suitable test data

7. Programming Techniques

Knowledge

- Subprograms
- Functions
- Parameters
- Return values

Skills

- Create functions
- Pass parameters into functions
- Return values from functions
- Call functions from programs
- Decompose programs into manageable modules
- Reuse program code effectively



8. File Handling

Knowledge

- Opening files
- Reading files
- Writing files
- Closing files
- End-of-file processing

Skills

- Read data from text files
- Process file contents
- Output file data
- Use loops with files
- Handle end-of-file conditions
- Apply casting when reading data

9. Databases and SQL

Knowledge

- Records
- Fields
- Data types
- SQL queries

Skills

- Identify records and fields
- Select suitable data types
- Write SQL SELECT statements
- Apply filtering conditions
- Correct errors in SQL statements

What should I do to revise and prepare for this assessment?

What useful websites/resources could I use to help me prepare?