Y13

Revision Olympics

Computer Science

Revision Guide
December 2024–May 2025

Exam Specification and General Support

Exam specification and exam board	A Level Computer Science – OCR H446
Past paper questions	https://www.ocr.org.uk/qualifications/asandalevel/computerscienceh046h446from2015/assessment/
Useful revision websites	Isaac Computer Science YouTube
Exam info	**Component 1** 11 June 2025 (AM) – 2.5 hours **Component 1** 18 June 2025 (AM) – 2.5 hours

Y13 Course

Week	Activity 1 (Paper 1)	Activity 2 (Paper 2)
1 2.12.24		
2 9.12.24		
3 16.12.24	**1.1 Characteristics of contemporary processors** **Diagram of CPU Components** Create a labeled diagram of the CPU showing the ALU, Control Unit, and Registers. **Summary of Fetch Decode Execute Cycle** Write a concise explanation of each stage with examples. **Research CPU Performance Factors** Prepare a report that discusses how clock speed, number of cores, and cache size affect performance, including real world examples. **Pipelining Explanation** Research pipelining, create a visual representation, and explain its benefits with examples. **Architecture Comparison** Write a comparative analysis of Von Neumann and Harvard architectures, highlighting their differences.	**2.1 Elements of computational thinking** **Abstract Model Creation** Devise an abstract model for a given situation (e.g., online shopping) and present it graphically. **Inputs and Outputs Identification** For a specific problem, list all inputs and outputs and create a flowchart to illustrate the process. **Steps to Solve Problems** Break down a complex problem into sequential steps and create a pseudocode outline. **Decision Points Discussion** Write a short essay discussing various decision points in a provided solution. **Concurrent Processing Benefits** Research and present a case where concurrent processing improved efficiency in a system.
4 06.01.25	**1.1 Types of processor** **CISC vs RISC Comparison Table** Create a table that lists the characteristics and uses of CISC and RISC processors. **GPU Applications Research** Investigate and summarize the applications of GPUs beyond graphics, such as in machine learning or data analysis. **Multicore Systems Benefits** Write a report on the advantages of multicore processing in modern applications.	**2.2 Problem solving and programming** **Coding Simple Examples** Write small programs demonstrating sequence, iteration, and branching using a programming language of choice (e.g., Python). **Develop a Modular Program** Create a program with modular components and explain the function of each module.

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5 13.01.25	**1.1 Input, output, and storage** **Poster of Input/Output Devices** Create a visual poster that displays various input and output devices and their functions. **Storage Devices Research** Research different types of storage devices (magnetic, flash, optical) and write a summary of their uses and characteristics. **RAM vs. ROM Comparison** Create a chart comparing RAM and ROM in terms of characteristics, uses, and performance.	**2.3 Algorithms** **Algorithm Design** Design an algorithm to solve a simple problem (e.g., finding the maximum number in a list) and describe its steps. **Efficiency Analysis** Analyse the efficiency of different algorithms and present findings using Big O notation.
6 20.01.25	**1.2 Systems Software** **Operating Systems Report** Write a report detailing the functions and purposes of various operating systems (e.g., Windows, Linux, macOS). **Flowchart for Memory Management** Create a flowchart illustrating paging and segmentation processes. **Research Scheduling Algorithms** Research different scheduling algorithms (e.g., round robin, shortest job first) and explain their use cases.	**2.2.1 Programming techniques** **Implement a Recursive Function** Write a program that uses recursion (e.g., factorial calculation) and explain how it works. **Scope Practice** Create examples demonstrating global and local variables in a programming context.
7 27.01.25	**Open Source vs. Closed Source Research** Research the advantages and disadvantages of open source versus closed source software and present findings. **Translators Explanation** Create a presentation explaining the roles of interpreters, compilers, and assemblers in software development.	**2.3.1 Algorithms** **Implement Bubble Sort** Write a program that implements the bubble sort algorithm and analyse its time complexity.

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8 3.02.25	**1.2 Software Development** **Mind Map of Methodologies** Create a mind map that illustrates different software development methodologies and their key features. **Algorithm Writing Practice** Write algorithms for various problems (e.g., sorting a list) and explain your thought process.	**2.1.1 Thinking abstractly** **Reflective Piece on Abstraction** Write a reflective essay on the importance of abstraction in computational problem solving.
9 10.02.25	**1.3 Exchanging data** **Research Compression Methods** Provide a report comparing lossy and lossless compression techniques with examples. **Encryption Techniques Explanation** Write a summary explaining symmetric and asymmetric encryption methods and their uses.	**2.1.2 Thinking ahead** **Checklist for Preconditions** Create a checklist identifying preconditions for solving a specific problem.
HALF TERM	**1.3 Databases** **ER Diagram Creation** Design an Entity Relationship diagram for a sample database scenario and explain the relationships between entities. **SQL Query Practice** Write and execute basic SQL queries to demonstrate understanding of data manipulation.	**2.1.3 Thinking procedurally** **Problem Breakdown** Break down a complex problem into smaller components and outline the steps needed for a solution.
10 24.02.25	**1.3 Networks** **Research Network Types** Write a report detailing differences between LAN and WAN, including advantages and disadvantages. **Protocols Chart** Create a chart listing common network protocols and their purposes.	**2.1.4 Thinking logically** **Logical Conditions Examples** Write examples that illustrate how logical conditions affect decisions in programming.

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11 3.03.25	**1.3 Web Technologies** **Create a Simple Web Page** Design a basic web page using HTML, CSS, and JavaScript, implementing different web technology concepts. **Search Engine Indexing Research** Research and summarize how search engines index web pages and the importance of SEO.	**2.1.5 Thinking concurrently** **Pros and Cons List** Create a pros and cons list discussing the benefits and trade offs of concurrent processing in computing.
12 10.03.25	**1.4 Data Types** **Data Types Table** Create a table listing primitive data types with examples and their applications. **Binary Conversion Practice** Practice converting decimal and floating point numbers to binary and hexadecimal (decimal) and vice versa, including positive and negative numbers.	**2.2.2 Computational methods** **Case Study Analysis** Analyse a case study that demonstrates problem recognition and decomposition in computational methods.
13 17.03.25	**1.4 Data Structures** **Implement Data Structures** Write code to implement arrays, linked lists, stacks, and queues, explaining their functionalities.	**2.2.1 Programming techniques** **Object Oriented Techniques** Create a class with attributes and methods, demonstrating object oriented programming principles.
14 24.03.25	**1.4 Boolean Algebra** **Simplifying Boolean Expressions** Practice simplifying Boolean expressions using laws and create truth tables for given expressions. **Logic Gates and Truth Tables** Create truth tables for various logic gates and provide examples of their applications.	**2.3.1 Algorithms** **Tree Traversal Implementation** Write code for both depthfirst and breadthfirst tree traversal algorithms and compare their efficiencies

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15 31.03.25	**1.5 Legal, moral, cultural, and ethical issues** **Research Key Legislation** Write summaries of key computing-related legislation (e.g., Data Protection Act) and discuss their implications. **Case Studies on Ethics** Discuss case studies that highlight moral and ethical issues in computing and technology.	**2.3.2 Algorithms** **Algorithm Suitability Analysis** Analyse a given scenario and discuss which algorithms would be suitable for solving the problem.
EASTER BEAK (week 1)	**1.5 Computing related legislation** **Key Laws Summary** Write a summary of key laws affecting computing and their implications for society. **Ethical Issues Discussion** Discuss the ethical implications of technologies such as AI and data mining.	**2.3.1 Algorithms** *Dijkstra and A Implementation* * Implement Dijkstra's shortest path and A* algorithms and analyse their performance in different scenarios.
EASTER BEAK (week 2)	**Revision of Paper 1 Topics** **Group Study Sessions** Organise group study sessions where you can review and discuss past paper questions from Paper 1.	**Revision of Paper 2 Topics** **Peer Teaching Sessions** Conduct peer teaching sessions where you explain key concepts from Paper 2 to each other.
16 21.04.25	**Mock Exam Paper 1** **Timed Practice Exam** Conduct a mock exam in a timed setting to simulate real exam conditions, followed by a review session.	**Mock Exam Paper 2** **Timed Practice Exam** Conduct a mock exam for Paper 2, followed by a review session focusing on common mistakes.
17 28.04.25	**Review Mock Exam 1** **Error Analysis** Analyse the mock exam results and errors and clarify difficult concepts.	**Review Mock Exam 2** **Error Analysis** Analyse the mock exam results and errors and clarify difficult concepts.

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Week	Activity 1 (Paper 1)	Activity 2 (Paper 2)
18 5.05.25	**Final Revision of Key Topics** **Revision of Key Topics** Schedule revision sessions on key topics analysed as weak	**Final Revision of Key Topics** **Revision of Key Topics** Schedule revision sessions on key topics analysed as weak
19 12.05.25	**Final Revision of Key Topics** **Revision of Key Topics** Schedule revision sessions on key topics analysed as weak	**Final Revision of Key Topics** **Revision of Key Topics** Schedule revision sessions on key topics analysed as weak
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HALF TERM	**Relaxation Techniques** **Mindfulness Practice** Practice mindfulness techniques such as deep breathing or meditation to reduce exam stress.	**Relaxation Techniques** **Mindfulness Practice** Continue mindfulness practices to maintain a calm mindset leading up to the exams.