Advance information June 2022

A-level Computer Science (7517)

Version 1.0

Because of the ongoing impacts of the Coronavirus (COVID-19) pandemic, we are providing advance information on the focus of June 2022 exams to help students revise.

This is the advance information for A-level Computer Science (7517).

Information

- This advance information covers components **7517/1 (all programming languages)** and **7517/2** only.
- It is **not** permitted to take this advance information into the exams.
- The format of the papers remains unchanged.
- The information is presented in specification order and not in question order.
- Exam questions will sample content from the areas specified in this advance information.
- Please refer to the detailed guidance for each paper/section for more information.

Advice

- Students and teachers should consider how to focus their revision of other non-listed parts of the specification, for example to review whether other topics may provide knowledge which helps understanding in relation to the areas being tested in 2022.
- Students will be credited for using any relevant knowledge from any non-listed topic areas when answering questions.
- Students will still be expected to apply their knowledge to unfamiliar contexts.
- Students will be expected to draw on knowledge, skills and understanding from across the specification when responding to synoptic questions.

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Focus of the June 2022 exam

Paper 7517/1 (all programming languages) Section A
Questions in this section will focus on the topics listed below. Where appropriate we have listed both the topic and content that will be assessed. If there is no content listed then questions may come from any of the content in that overall topic area in the specification.

Specification reference	Name of topic	Content
4.1.1.16	Recursive techniques	
4.2.1.2	Single- and multi-dimensional arrays (or equivalent)	
4.2.1.4	Abstract data types/data structures	Be able to distinguish between static and dynamic structures and compare their uses, as well as explaining the advantages and disadvantages of each.
4.2.2	Queues	
4.2.3	Stacks	
4.2.4	Graphs	Be aware of a graph as a data structure used to represent more complex relationships. **AND** Be able to explain the terms: • graph • weighted graph • vertex/node • edge/arc • undirected graph • directed graph. **AND** Know how an adjacency matrix and an adjacency list may be used to represent a graph.
4.2.5	Trees	Know that a tree is a connected, undirected graph with no cycles.
4.3.1	Graph-traversal	
4.3.4	Searching algorithms	
4.3.5	Sorting algorithms	
4.3.6	Optimisation algorithms	
4.4.1.1	Problem-solving	Be able to develop solutions to simple logic problems.
4.4.1.2	Following and writing algorithms	Be able to hand-trace algorithms.

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4.4.4.3	Order of complexity	
4.4.4.7	Halting problem	

Paper 7517/1 (all programming languages) Section B – No advance information for this section

Paper 7517/1 (all programming languages) Section C – No advance information for this section – questions in this section will refer to the Skeleton Program and could also refer to any content from sections 4.1, 4.2, 4.3 and 4.4 of the specification.

Paper 7517/1 (all programming languages) Section D – No advance information for this section

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Paper 7517/2

Questions in this examination will focus on the topics listed below. Where appropriate we have listed both the topic and content that will be assessed. If there is no content listed then questions may come from any of the content in that overall topic area of the specification.

Specification reference	Name of topic	Content
4.5.2	Number bases	
4.5.3	Units of information	
4.5.4.2	Unsigned binary arithmetic	
4.5.4.3	Signed binary using two's complement	
4.5.4.4	Numbers with a fractional part	
4.5.4.6	Absolute and relative errors	Be able to calculate the absolute error of numerical data stored and processed in computer systems. **AND** Be able to calculate the relative error of numerical data stored and processed in computer systems.
4.5.4.8	Normalisation of floating point form	
4.5.6.7	Digital representation of sound	Calculate sound sample sizes in bytes.
4.5.6.8	Musical Instrument Digital Interface (MIDI)	
4.6.1.2	Classification of software	
4.6.1.3	System software	

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4.6.1.4	Role of an operating system (OS)	Know that the OS handles resource management, managing hardware to allocate processors, memories and I/O devices among competing processes.
4.6.2	Classification of programming languages	Know that low-level languages are considered to be: • machine-code • assembly language. **AND** Describe machine-code language and assembly language. **AND** Understand the advantages and disadvantages of machine-code and assembly language programming compared with high-level language programming.
4.6.4	Logic gates	
4.6.5	Boolean algebra	
4.7.1	Internal hardware components of a computer	Be able to explain the difference between von Neumann and Harvard architectures and describe where each is typically used.
4.7.2	The stored program concept	
4.7.3.3	The processor instruction set	
4.7.3.4	Addressing modes	
4.7.3.5	Machine-code/assembly language operations	
4.7.4.1	Input and output devices	
4.7.4.2	Secondary storage devices	Explain the need for secondary storage within a computer system. **AND** Know the main characteristics, purposes, suitability and understand the principles of operation of the following devices: • hard disk • optical disk • solid-state disk (SSD).
4.8.1	Individual (moral), social (ethical), legal and cultural	

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	issues and opportunities	
4.9.1	Communication	
4.9.2.2	Types of networking between hosts	
4.9.3.1	The Internet and how it works	Describe the term 'uniform resource locator' (URL) in the context of internetworking. **AND** Explain the terms ‘fully qualified domain name’ (FQDN), ‘domain name’ and ‘IP address’. **AND** Describe how domain names are organised. **AND** Understand the purpose and function of the domain service and its reliance on the Domain Name Server (DNS) system.
4.9.4.11	Thin- versus thick-client computing	
4.10.1	Conceptual data models and entity relationship modelling	
4.10.2	Relational databases	The content in this section will not be directly assessed but students will need to have an understanding of it to answer other questions.
4.10.3	Database design and normalisation techniques	
4.10.4	Structured Query Language (SQL)	
4.12.1.3	Function application	
4.12.1.5	Composition of functions	
4.12.2	Writing functional programs	
4.12.3	Lists in functional programming	

END OF ADVANCE INFORMATION

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